

# PROSIDING PERKEM 16

**PERSIDANGAN KEBANGSAAN EKONOMI  
MALAYSIA (PERKEM) KE-16, 2023**

**“RESILIENCE AND INCLUSIVITY IN DRIVING  
ECONOMIC RECOVERY IN  
THE ERA OF GEO-POLITICS UNCERTAINTY”**

**4-6 OGOS  
2023**

**THE LIGHT HOTEL  
PENANG, MALAYSIA**

**ANJURAN**

**FAKULTI EKONOMI DAN PENGURUSAN  
UNIVERSITI KEBANGSAAN MALAYSIA**

**DENGAN KERJASAMA**

**KURSI ENDOWMEN MPOB-UKM  
KURSI YAYASAN TUN ISMAIL MOHAMED ALI (YTI-UKM)  
PERTUBUHAN LEGASI TUN ABDULLAH AHMAD BADAWI (LEGASI)  
FORUM EKONOMI MALAYSIA (FEM)**



**PROSIDING / *PROCEEDINGS OF***  
**PERSIDANGAN KEBANGSAAN EKONOMI MALAYSIA**  
***THE MALAYSIAN NATIONAL ECONOMIC CONFERENCE***

eISSN: 3009-0466

2023

**TEMA/ THEME**

**“KETAHANAN DAN KETERANGKUMAN DALAM MEMACU  
PEMULIHAN EKONOMI DI ERA KETIDAKPASTIAN GEO-  
POLITIK”**

5 OGOS 2023

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**Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke-16, 2023.**

*“Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik”*  
5 Ogos 2023

## **LATAR BELAKANG PERKEM / ABOUT PERKEM**

Persidangan Kebangsaan Ekonomi Malaysia (PERKEM) merupakan siri seminar tahunan anjuran Pusat Kajian Pembangunan Inklusif dan Lestari (SID), Fakulti Ekonomi dan Pengurusan, Universiti Kebangsaan Malaysia (UKM). Persidangan ini menyediakan platform kepada para penyelidik, pembuat dasar dan mereka yang berminat untuk mengikuti dan mengetahui perkembangan ekonomi Malaysia secara lebih dekat melalui pembentangan hasil-hasil penyelidikan yang memberi tumpuan terhadap pelbagai persoalan berkaitan pertumbuhan, pembangunan ekonomi dan persekitaran perniagaan. Melalui persidangan ini, selain menambah khazanah ilmu dalam bidang ekonomi dan perniagaan, dapatan kajian yang dibentangkan dapat dijadikan panduan dan rujukan kepada mereka yang terlibat dalam menyediakan rancangan-rancangan pembangunan pada masa hadapan, khususnya yang melibatkan ekonomi Malaysia.

*The Malaysian National Economic Conference (PERKEM) is an annual seminar series organized by Center for Sustainable and Inclusive Development Studies, Faculty of Economics and Management, The National University of Malaysia (UKM). This conference provides a platform for researchers, policy makers and those who are interested to know and keep trail regarding Malaysia's economic development through the presentation of research findings that focus on various issues pertaining to economic development, growth and business environment. Through this conference, apart from adding to the body of knowledge in economics and business discipline, findings from presented papers are useful as reference point for those involved in preparing future development plans, especially with regards to the Malaysian economic.*

**Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke-16, 2023.**

*"Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik"*  
5 Ogos 2023



## KATA PENGANTAR / *PREFACE*

Alhamdulillah, rasa syukur dirafakkan kepada Allah S.W.T. kerana dengan keizinan-Nya Prosiding Persidangan Kebangsaan Ekonomi Malaysia dapat diterbitkan bersempena dengan PERKEM Ke-16 2023 yang berlangsung di The Light Hotel, Pulau Pinang. Prosiding ini berperanan sebagai rujukan utama bagi kajian-kajian yang dibentangkan dalam persidangan PERKEM kali ini. Ia member manfaat kepada peserta dan juga orang awam untuk memahami isu yang dibentangkan dengan lebih lanjut.

Tema PERKEM-16 adalah '*Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik*'. Tema ini sangat bertepatan dengan lanskap ketidakpastian ekonomi global masa kini akibat krisis geo-politik yang sangat memberi kesan kepada usaha pemulihan ekonomi pasca pandemik Covid-19. Krisis geo-politik Rusia-Ukraine telah mencetuskan krisis global berkaitan makanan, kekurangan bahan api dan baja, kemanusiaan seperti kelaparan, kekurangan zat makanan dan perpindahan paksa. Krisis geo-politik juga telah menjerumus negara dunia ke dalam krisis lonjakan harga makanan sekaligus mencetuskan ketidakpastian terhadap masa depan keselamatan makanan di seluruh dunia, terutamanya di negara-negara membangun yang miskin. Adalah diharapkan persidangan ini menjadi platform ilmiah terbaik bagi membincangkan cabaran dalam melaksanakan pemulihan ekonomi di era ketidakpastian geo-politik dan seterusnya mencadangkan strategi pemulihan ekonomi yang utuh dan inklusif dalam mendepani cabaran masa mendatang.

Prosiding PERKEM-16 mengandungi 22 kertas kerja telah yang disusun berdasarkan subtema yang antara lain meliputi (i) Memperkukuh Asas Ekonomi Makro (ii) Mengembalikan Semula Momentum Pertumbuhan (iii) Melonjakkan Pertumbuhan Industri Strategik dan Berimpak Tinggi serta Perusahaan Mikro, Kecil dan Sederhana (iv) Meningkatkan Pertahanan, Keselamatan, Kesejahteraan dan Perpaduan (v) Menangani Kemiskinan dan Membangunkan Masyarakat Inklusif (vi) Mempertingkatkan Keseimbangan dan Keterangkuman Wilayah vii. Mempercepat Pertumbuhan Hijau untuk Kemampanan dan Daya Tahan (viii) Membangunkan Bakat Masa Hadapan (ix) Memperkukuh Penyampaian Perkhidmatan Sektor Awam dan (x) Keperluan Perakaunan Lestari dalam Memperkukuh Pembangunan Ekonomi Mampan. Kepelbagaian tema dan bidang ekonomi yang dibincangkan dapat memberi peluang yang seluasnya kepada peserta persidangan dan pembaca untuk menatapi pelbagai hasil penyelidikan dan penemuan baharu. Dapatan ini amat bermanfaat kepada penggubal dasar dan pengkaji akan datang.

Semoga prosiding ini dapat memberi manfaat kepada negara dan bangsa. Sekian, terima kasih.

**Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke-16, 2023.**

*"Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik"*

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**PERSIDANGAN / CONFERENCE**

Tema utama persidangan pada tahun 2023 ialah “*Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik*”

Perkara yang akan menjadi fokus perbincangan persidangan merangkumi dua aspek penting yang menjadi tunjang persidangan kali ini iaitu:

- Ketahanan dan keterangkuman dalam memacu pemulihan ekonomi negara pada era ketidakpastian geo-politik global.

Bertunjangkan aspek penting tersebut, PERKEM - 16 meneruskan kelangsungan dengan menyediakan platform pertemuan kepada semua pihak termasuk para penyelidik, pentadbir, pelaksana dasar, pihak swasta dan semua pihak yang berminat untuk sama-sama berbincang dan berkongsi ilmu dalam membincangkan isu dan mengemukakan solusi bagi memperkukuhkan pemulihan ekonomi negara pada era ketidakpastian krisis global seperti geo-politik dan krisis-krisis lain pada masa mendatang.

*The main conference theme in year 2023 is “Resilience and Inclusivity in Driving Economic Recovery in The Era of Geo-Politics Uncertainty”.*

*The subject matter that will be the focus of the conference discussions will cover two important aspects that will be the cornerstone of the conference this time, namely:*

- *Resilience and inclusivity in driving economic recovery in the era of global geo-politics uncertainty.*

*Given these two important aspects, PERKEM 16 continues to provide a platform for all parties including researchers, administrators, policymakers, the private sector and all interested parties to collaborate and share knowledge in discussing and sharing knowledge in discussing issues and presenting solutions to strengthen the recovery of the country's economy in an era of global crisis uncertainty, such as geo-politics and other future crises.*

## SUB-TEMA / *SUB-THEMES*

1. Memperkukuh Asas Ekonomi Makro (*Strengthening Macroeconomic Fundamental*)
2. Mengembalikan Semula Momentum Pertumbuhan (*Restoring Growth Momentum*)
3. Melonjakkan Pertumbuhan Industri Strategik dan Berimpak Tinggi serta Perusahaan Mikro, Kecil dan Sederhana (*Propelling Growth of Strategic and High Impact Industries as well as Micro, Small and Medium Enterprises*)
4. Meningkatkan Pertahanan, Keselamatan, Kesejahteraan dan Perpaduan (*Enhancing Defence, Security, Wellbeing and Unity*)
5. Menangani Kemiskinan dan Membangunkan Masyarakat Inklusif (*Addressing Poverty and Building an Inclusive Society*)
6. Mempertingkat Keseimbangan dan Keterangkuman Wilayah (*Improving Regional Balance and Inclusion*)
7. Memperkukuh Pembangunan Sosioekonomi di Sabah dan Sarawak (*Enhancing Socioeconomic Development in Sabah and Sarawak*)
8. Mempercepat Pertumbuhan Hijau untuk Kemampanan dan Daya Tahan (*Advancing Green Growth for Sustainability and Resilience*)
9. Mempertingkat Kemampanan Tenaga dan Mentransformasi Sektor Air (*Enhancing Energy Sustainability and Transforming the Water Sector*)
10. Membangunkan Bakat Masa Hadapan (*Developing Future Talent*)
11. Melonjakkan Pendigitalan dan Teknologi Termaju (*Boosting Digitalisation and Advanced Technology*)
12. Memperkukuh Kecekapan Infrastruktur Pengangkutan dan Logistik (*Enhancing Efficiency of Transport and Logistics Infrastructure*)
13. Memperkukuh Penyampaian Perkhidmatan Sektor Awam (*Strengthening Public Sector Service Delivery*)
14. Keperluan Perakaunan Lestari dalam Memperkukuh Pembangunan Ekonomi Mampan (*Sustainable Accounting Requirements in Strengthening Sustainable Economic Development*)

**PERSIDANGAN KEBANGSAAN EKONOMI MALAYSIA (PERKEM) KE-16,  
2023**

***Concurrent Session I***

<b>Session 1A: Strengthening Macroeconomic Fundamental</b>		
<b>Venue:</b> <i>Cinnamon Room</i>	<b>Time:</b> 2.00-4.00pm	<b>Chair Session:</b> <i>Dr. Raudha Md Ramli</i>
<b>Presenter:</b>	<b>Paper Title</b>	
<b>1. Rahwani Azmi, Mustazar Mansur</b>	Analisis Kesan Perbelanjaan Kerajaan Terhadap Pembangunan Manusia Di Malaysia	
<b>2. Devendran Nadaraja, Mohd Edil Abd Sukor</b>	The Relationship Between Monetary Policy and Stock Market Liquidity: Evidence from Malaysia	
<b>3. Nor Asmat Ismail</b>	Cost of living and consumer confidence during MCO in Malaysia	
<b>4. Suziana Hassan</b>	The Use of Subsidy Reduction as a Payment Vehicle in Economic Valuation for Environmental Conservation in Malaysia	
<b>5. Chen Yudong, Mohd Azlan Shah Zaidi, Zulkefly Abdul Karim, Wan Kamal Mujani</b>	Unravelling the Nexus: Exploring the Effects of Shocks to Oil price, Cryptocurrencies and Global Economic Policy Uncertainty on the Economic Performance of Selected ASEAN Countries	
<b>6. Norimah Rambeli, Asmawi Hashim, Norasibah Abdul Jalil, Emilda Hashim, Nooraisah Katmon, Siti Zubaidah Mohd. Ariffin</b>	The Impact of Government's Health and Education Expenditures on Insurance Demand in Malaysia	
<b>7. Asmawi Hashim, Norimah Rambeli, Norasibah Abdul Jalil, Emilda Hashim</b>	The Dynamic Relationship Between Healthcare Expenses, Economic Growth and Other Selected Macroeconomics	
<b>8. Hazrul Shahiri</b>	Is a Single Minimum Wage Policy Viable Option? Evidence from The Impact of Minimum Wage on Youth Employment in Malaysia.	

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**Session 1B: Addressing Poverty and Building an Inclusive Society**

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**Venue:**  
*Clove Room*

**Time:**  
2.00-4.00pm

**Chair Session:**  
*Assoc. Prof. Dr. Shahida  
Shahimi*

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Doris Padmini Selvaratnam</b> , Yayuk Eko Wahyuningsih	An Overview of the Consumer Empowerment Index Among Youths in Malaysia
<b>2. Muhamad Hilmi Abdul Rahman</b> , Rohana Jani	Economic Strengthening Programs for Women: A Community Based Approach
<b>3. Alfred Khaw</b> , Nasir Saukani	The State of the Art of the Sharing Economy and Digital Inequality: A Review and Research Direction
<b>4. Nasir Saukani</b> , Rubayah Yakob, Alfred Khaw, Lai Wei Sieng	Innovation for Inclusive Development: An Inclusive Innovation Index (III) as a New Measurement of Inequality
<b>5. Atik Purmiyati</b> , Vandi Romadhoni, Nonny Anggela, Sri Wahyuni, Tamat Sarmidi	Effect of Political and Economic Dimensions on Poverty: Evidence from Indonesia
<b>6. Norasibah Abdul Jalil</b> , Norimah Rambeli, Emilda Hashim, Asmawi Hashim, Normala Zulkifli	Faktor Penyumbang Stres Dalam Kalangan Pelajar UPSI Dalam Tempoh Sebelum-Semasa Pandemik Covid19
<b>7. Muhammad Muzammil Kamis</b> , Fathin Faizah Said, Nafisah Mohammed, Azmafazilah Jauhari, Khairul Nizam Abdul Maulud,	Economic Vulnerability Assessment of Coastal Community Households to Climate Change: Gender Dimensions
<b>8. Suhaili Alma'amun</b> , Nur Adyani Sabarudin	Kemiskinan Multidimensi Sebagai Faktor Penentu Prestasi Pendanaan Awam Pelajar

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**Session 1C: Enhancing Defence, Security, Wellbeing and Unity**

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**Venue:**  
*Capers Room*

**Time:**  
2.00-4.00pm

**Chair Session:**  
*Assoc. Prof. Dr. Hairunnizam  
Wahid*

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Zurifahida Zulkifli, Ishak Haji Abd Rahman, Azmi Aziz, Abdullah Sanusi Othman</b>	Tahap Kesedaran Dan Daya Tahan Komuniti Dalam Menghadapi Bencana:Kajian Kes Di Kelang,Selangor.
<b>2. Siti Sarawati Johar, Nur Azah Razali, Nor Shela Saleh, Zahrul Akmal Damin,</b>	Impak Domain Emosi, Kesedaran Kendiri, Kesejahteraan Emosi dan Pengawalseliaan Emosi ke atas Norma Bekerja dari Rumah
<b>3. Fitriyah Razali, Nurul Farah Syafina Adnan, Siti Zaleha Daud, Nur Berahim</b>	The Wellbeing of Building Occupants Through the Physical, Functional and Psychological Comforts
<b>4. Emilda Hashim, Norimah Rambeli@Ramli, Norasibah Abdul Jalil, Asmawi Hashim, Nurhanani Romli</b>	Factors Affecting Balanced Nutrition Among University Students In Muallim District, Perak
<b>5. Ainin Sofiya Muhamad Darwan Dewa, Aminah Mohsin, Zafirah Ab.Muin, Maryanti Raid, Zaleha Daud</b>	Alternatif Penyelesaian Terhadap Isu Tempat Letak Kenderaan di Perumahan Strata Kos Rendah
<b>6. Rospidah Ghazali, Ruziana Mohd Ghazi</b>	Multi-Dimensi Kemudahterancaman Penternak Ikan Sangkar di Sungai Pahang

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***Advancing Green Growth for Sustainability and Resilience***

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<b>7. Muhammad Sufi Mahbub, Syahrul Zaman Mohd Sharil, Athirah Sufi</b>	Malaysia's Rainforest Biodiversity a Sustainable Green Investment
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**Session 1D: Boosting Digitalisation and Advanced Technology**

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**Venue:**  
*Cardamom Room*

**Time:**  
2.00-4.00pm

**Chair Session:**  
*Assoc. Prof. Dr. Hafizuddin  
Syah Bangaan Abdullah*

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Nur Filzah Zainuddin,</b> Idris Osman, Suhailah Kassim, Mohd Zailani Othman, Suraya Hamimi Mastor, Nurul Hidayah Mat Zain	Effects of Technology Readiness on Continuance Intention of E-wallet Usage among Rural Youth in Malaysia: Trust as a Mediator
<b>2. Citra Amanda,</b> Ananta Dian Pradipta	Deciphering the Role of Money Market Funds and Digital Technology in Shaping NCD Yields: A Study within the ASEAN countries
<b>3. Fatin Aqilah Maskuri,</b> <b>Mohd Zailani Othman,</b> Idris Osman, Suhailah Kassim, Noraznira Abd Razak, Salmi Mohd Isa	A Comparative Case Study in Social Network Site Usage between a Utility Sector and a Financial Sector in Malaysia
<b>4. Aminudin Mokhtar,</b> Nur Natasha Rosdi, Adriana Delaila Yusddy	Hubungan antara Harga Mata Wang Kripto di Bursa Binance dan Bursa Luno Malaysia
<b>5. Ma Hui,</b> Zulkefly Abdul Karim, Noorasiah Sulaiman, Abdul Hafizh Mohd Azam	Corporate Income Tax Incentives and Digital Companies' R&D Investment: A New Evidence Using China's Micro-Panel Data
<b>6. Sani Inusa Milala,</b> <b>Khadijah Md Ariffin</b>	Artificial Intelligence Valuation Framework: A Comprehensive Approach
<b>7. Noor Azuan Hashim,</b> Nurdayana Hidayah Jan Mohd Suzaini	Mobile Service Usages Among Malaysian Smallholders
<b>8. Trinitaria Marlis Putri</b>	Impact of Shop Attributes and Digitalization in Children Buyings Decision

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**Session 1E: Developing Future Talent & Restoring Growth Momentum**

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<b>Venue:</b> <i>Executive Board Room</i>	<b>Time:</b> 2.00-4.00pm	<b>Chair Session:</b> <i>Assoc. Prof. Dr. Mariani Abdul Majid</i>
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***Developing Future Talent***

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Farous Izwan Abdul Aziz,</b> Syahrul Nizam Salam, Seriaznita Mat Said	Persuasive Argument Training for Graduates Seeking Employment
<b>2. Idris Osman,</b> Norraeffa Md Taib, Zarinah Abu Yazid, Shahreena Daud, Mohd Zailani Othman	Learning Through Play: Learners' Usability and Engagement in Board Game with the MEEGA+ Assessment Model

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***Restoring Growth Momentum***

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<b>3. Fadhilah Mat Yamin,</b> Wan Hussain Wan Ishak, Hapini Awang, Nur Syazwani Mohd. Nawi, Md. Tajudin Morad, Mira Habshah Shamshazreen Samsulkamal	Isu Kemiskinan Digital Dalam Kalangan Pendidik Luar Bandar di Negeri Kedah
<b>4. Muzafar Shah Habibullah,</b> Mohd Yusof Saari, Muhammad Daaniyall Abd Rahman, Nur Eliya Syahira Che Rosly	Are Holidays Good or Bad for The Economy? Cross-National Evidence From 101 Countries
<b>5. Zulkefly Abdul Karim</b>	The Impact of International Trade and FDI on Income Equality: A Panel Evidence Using China's Provinces Level Data
<b>6. Maizatulakma Abdullah,</b> Mohamat Sabri Hassan	Pelaporan Alam Sekitar bagi Pekebun Kecil Industri Sawit di Malaysia
<b>7. Muhamad Rias K V Zainuddin</b>	Revisiting the Impact of Bilateral and Regional FTAs on Palm Oil Export

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**PERSIDANGAN KEBANGSAAN EKONOMI MALAYSIA (PERKEM) KE-16,  
2023**

***Concurrent Session 2***

<b>Session 2A: Strengthening Macroeconomic Fundamental &amp; Sustainable Accounting Requirements in Strengthening Sustainable Economic Development</b>		
<b>Venue:</b> <i>Cinnamon Room</i>	<b>Time:</b> 4.15-6.15pm	<b>Chair Session:</b> <i>Assoc. Prof. Dr. Zurina Kefeli</i>
<b>Strengthening Macroeconomic Fundamental</b>		
<b>Presenter:</b>	<b>Paper Title</b>	
<b>1. Naziatul Aziah Mohd Radzi,</b> Mukhriz Izraf Azman Aziz, Hazrul Izuan Shahiri	Spillovers and Connectedness Between ASEAN-5 Currencies and Economic Uncertainties	
<b>2. Muzdalifah,</b> Ryan Juminta Anward, Viona Regita Cahaya Iskandar, Fajriannoor	Inter-Sectoral and Inter-Regional Linkages in the Economy of South Kalimantan Province: Analysis of Inter Regional Input Output (IRIO)	
<b>Sustainable Accounting Requirements in Strengthening Sustainable Economic Development</b>		
<b>3. Nurul Fatma Aziz,</b> Rosiati Ramli, Amizawati Mohd Amir, Hairunnizam Wahid, Siti Maziah Abdul Rahman	Having, Giving and Getting: Slack Resources, Corporate Zakat and Company's Financial Performance	
<b>4. Mohammad Bintang Pamuncak,</b> Hairunnizam Wahid, Abd Ghafar Ismail, Tamat Sarmidi	Political Zakat Policy: A Proposed Framework	
<b>5. Chee-Pung Ng,</b> Vanessa Rosse A/P Gerard Jeevan, Poh-Kiong Tee; Chee-Hoo Wong, Alex Hou Hong Ng, Ling-Chai Wong	Environmental, Social and Governance (ESG) Scores and Financial Performance in Malaysia	
<b>6. Lailah Fujianti,</b> Nelyumna, Widyaningsih Azizah, Sinta Budi Astuti, Nurul Hilmiah, Nur Abibah Ardelia	Good Corporate Governance and Environmental, Social, Governance (ESG) Disclosures: Evidence from Indonesia	
<b>7. M. Zaky Mubarak Lubis,</b> Muhammad Ilhamdi, Maisya Pratiwi, Gusti Dirga Alfakhri Putra	The Effect of Profitability, Leverage, and Liquidity on Tax Aggressiveness in Energy Sector Companies on the Indonesia Stock Exchange in 2019-2021	

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**Session 2B: Addressing Poverty and Building an Inclusive Society  
&  
Improving Regional Balance and Inclusion**

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<b>Venue:</b> <i>Clove Room</i>	<b>Time:</b> 4.15-6.15pm	<b>Chair Session:</b> <i>Assoc. Prof. Dr. Doris Padmini Selvaratnam</i>
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***Addressing Poverty and Building an Inclusive Society***

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Jalihah Md Shah,</b> Rosazman Hussin, Asmady Idris	Program Pembasmian Kemiskinan di Sabah: Isu dan Cabaran
<b>2. Noor Amirah Zaidon,</b> Zulkefly Abdul Karim, Rosmah Nizam, Mohd Azlan Shah Zaidi, Norlin Khalid	Financial Inclusion and Income Inequality: A Threshold Analysis
<b>3. Sarmila Md Sum,</b> Zaimah Ramli, Azima Abd Manaf, Rosmiza Mohd Zainol, Mohd Yusran Omar	Hubungan Modal Sosial Terhadap Tahap Aktiviti Ekonomi Pekebun Kecil Sawit: Kajian Kes PKS di Negeri Perak
<b>4. Mokhammad Nurruddin Zanky,</b> Hamizah Abd Hamid, Nor Liza Abdullah, Mohd Hizam-Hanafiah	Business Resources in Disadvantage Circumstances to Address Poverty: A Case Study in Malang, Indonesia

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***Improving Regional Balance and Inclusion***

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<b>5. Siti 'Aisyah Baharudin,</b> Hayyan Nassar Waked	Emerging Perspectives on Agrotourism in Malaysia: A Systematic Review of Development, Socio-Economic Effects, and Challenges
<b>6. Zhenyi Mawang,</b> Lai Wei Sieng	Influence of Digital Economy on Sustainable Development in ASEAN
<b>7. Noorlianni Rosli,</b> Syazreen Niza Shair, Shamshimah Samsudin	Cluster Analysis on Long-term Elderly Care Systems in Malaysia: Lesson Learnt from Japan, Singapore, and the United States of America
<b>8. Iha Haryani Hatta,</b> Lailah Fujianti, Nurul Hilmiyah, Harimurti Wulandjani	The Determinants of Transfer Pricing: Evidence from Indonesia

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**Session 2C: Propelling Growth of Strategic and High Impact Industries as well as  
Micro, Small and Medium Enterprises**

**&**

**Advancing Green Growth for Sustainability and Resilience**

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<b>Venue:</b> <i>Capers Room</i>	<b>Time:</b> 4.15-6.15pm	<b>Chair Session:</b> <i>Prof. Dr. Zulkefly Abdul Karim</i>
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**Propelling Growth of Strategic and High Impact Industries as well as Micro, Small  
and Medium Enterprises**

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<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Khairunissa Mohd Adnan,</b> Norlin Khalid, Abdul Hafiz Mohd Riayati Ahmad	Analysing of Green Bonds and Economy Growth in Southeast Asian countries
<b>2. Ignasius Heri Satrya Wangsa,</b> Sulastri, Diana Putri Arini	It goes beyond product - Business Innovativeness and Consumer's New Values Adoption
<b>3. Maryam Jameelah Mohd Hashim,</b> Idris Osman, Mohd Rahim Khamis	Empowering Bumiputra SMEs Through Intellectual Capital: Lessons from A Developing Nation
<b>4. Hariati Abdullah Hashim,</b> Maimunah Sapti	Magnetic Indicators of Economic Agglomeration for Industrial Investment Environment in Malaysia
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<b>6. Hanisah Mohd Sobre, Mariani Abdul Majid,</b> Mohd Fahmi Ghazali, Mohd Hasimi Yaacob	Information Sharing and SME Access to Finance

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**Advancing Green Growth for Sustainability and Resilience**

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<b>7. Muhammad Jasrim Ku Hakim Jamaludin,</b> Fathin Faizah Said, Nor Ghani Md Nor, Zulkefly Abd Karim, Aisyah Abd Rahman, Syajarul Imna Mohd Amin	A Systematic Review on Green Finance Policy and Climate Mitigation: A Tools Racing for Delivering Sustainable Development Goals (SDG)
<b>8. Muzafar Shah Habibullah, Nur Surayya Mohd Saudi,</b> Nur Ameera A Jaz, Baharom Abdul Hamid	Global Evidence on the Impact of Military Expenditure on Ecological Footprint: Some Robust Results

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**Session 2D: Enhancing Defence, Security, Wellbeing and Unity  
&  
Strengthening Public Sector Service Delivery**

<b>Venue:</b> <i>Cardamom Room</i>	<b>Time:</b> 4.15-6.15pm	<b>Chair Session:</b> <i>Dr. Mustazar Mansur</i>
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**Enhancing Defence, Security, Wellbeing and Unity**

<b>Presenter:</b>	<b>Paper Title</b>
<b>1. Zaimah Ramli, Abd Rahim Abd Razak</b>	Simpanan Kecemasan Dalam Kalangan Generasi Milenium
<b>2. Nurul Amira Abdul Wahab, Azima Abdul Manaf, Zaimah Ramli, Suraiya Ishak, Zanisah Man</b>	Keperluan Elemen Tanah Komunal Bagi Memperkasa Komuniti Orang Asli Ke Arah Keselamatan Pemilikan Tanah
<b>3. Raudha Md Ramli</b>	Potensi Wakaf dalam Tenaga Boleh Diperbaharui di Malaysia

**Strengthening Public Sector Service Delivery**

<b>4. Hairunnizam Wahid, Mohammad T A KH R Fozaie, Tamat Sarmidi, Norlin Khalid</b>	Pengaruh Tingkah Laku Buruk Terhadap Pembangunan Ekonomi Negara Islam
<b>5. Vika Annisa Qurrata, Abdul Ghafar Ismail, Muhammad Hakimi Mohd. Shafiai, Hairunnizam Wahid, Suhaili Alma'amun</b>	Establishing Waqf Institution from Institutional Economic Theory
<b>6. Abdul Ghafar Ismail, Muhammad Hakimi Mohd. Shafiai, Nurul Huda Abdul Majid</b>	Zakat and the Constitution
<b>7. Khairunnisa Mokhtar, Syazreen Niza Shair</b>	Analysis of Long-term Care Costs in Malaysia: A Case Study for Private Institutions
<b>8. Wan Norhidayah W Mohamad, Tareq Mzek; Zaiton Samdin</b>	Visitors' Preferences and Willingness to Pay for Recreational Park Attributes in Malaysia: A Choice Experiment Considering the Implications of Attribute and Attributes' Level Non-Attendance

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**Session 2E: Strengthening Macroeconomic Fundamental  
&  
Propelling Growth of Strategic and High Impact Industries as well as Micro, Small  
and Medium Enterprises**

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<b>Venue:</b> <i>Executive Board Room</i>	<b>Time:</b> 4.15-6.15pm	<b>Chair Session:</b> <i>Dr. Lai Wei Sieng</i>
<b>Presenter:</b>	<b>Paper Title</b>	
<b>1. Hafizuddin-Syah, Norlin Khalid, Kadir Arifin, Kadaruddin Aiyub</b>	The Effect of Occupational Safety and Health Indicators on the Gross Domestic Products: The Case of Malaysia	
<b>2. Syjarul Imna Mohd Amin, Md Shafiin Shukor, Aisyah Abdul-Rahman</b>	Gravity Stochastic Frontier Model Analysis of Malaysian Palm Oil Export Efficiency: A Two-decade Study	
<b>3. Abdul Hafizh Mohd Azam, Mohd Syafiq Sabri</b>	Monetary Policy and Uncertainty	
<b>4. Norlin Khalid, Mohd Azlan Shah Zaidi, Riayati Ahmad</b>	Economic Recovery Post Covid and Long-Term Impact of Covid on the Economy	
<b>5. Shahida Shahimi, Nur Aiman Kamarul Ariffin @ Azmi</b>	Impak Amalan dan Aktiviti Kelestarian terhadap Prestasi Firma Perbankan dan Kewangan di Malaysia	
<b>6. Lai Wei Sieng, Nurul Izzah Syakirah Shahirul Basir</b>	Factors Influencing Saving Behavior among Young Generation in Malaysia	
<b>7. Wang Yunxiang, Mohd Fahmi Ghazali, Ruzanna Ab Razak</b>	Fiscal and Monetary Policy Interaction in Malaysia: Coordination or Conflict?	

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## AN OVERVIEW OF THE CONSUMER EMPOWERMENT INDEX AMONG YOUTHS IN MALAYSIA

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### **ABSTRACT**

*Consumer empowerment is vital to ensuring that consumers recognize goods and services that satisfy their basic needs first. Ethical suppliers will produce quality products for the well-being of society. Nevertheless, in reality, consumers often encounter low-quality products, over-priced, and sometimes receive different products than those claimed by sellers in shops or on digital marketing platforms. A study on consumer empowerment is conducted to identify the level of awareness of Malaysian youths on the importance of basic needs, purchasing quality goods as promised by the seller, and taking necessary action when they are cheated or scammed. This study aims to analyze the impact of the Consumer Empowerment Index (CEI) indicator on purchasing diverse needs among young consumers in Malaysia. The study used a sample of 5,319 primary data collected from youths enrolled in different high schools and universities in Malaysia. Multiple linear regression is employed as a quantitative method for data analysis. The CEI for Malaysian youth is 61.99%. The CEI's percentage of the cognitive domain is 78.66%, indicating that it is imperative in making short-term and long-term financial goals. Meanwhile, from an affective domain perspective, 51.75% said asking for product and service exchanges was important. However, the weakness is in terms of practice. The majority, 61.79% of youths, had never made any complaints before. Two indicators of the consumer empowerment index, namely affective and cognitive domains, have a statistically significant impact of 0.011 on product purchases at a significance level of  $\alpha = 5\%$ . Specifically, the affective domain exhibits a coefficient of -53.594, indicating the action taken if the seller does not want to exchange the product. On the other hand, the cognitive domain highlights the importance of financial determinants for youths in meeting their basic needs as consumers. From the CEI's point of view, 78.66% of respondents said it was essential for both short-term and long-term financial goal setting, and 51.75% said it was crucial for encouraging repeat purchases of products and services. However, 61.79% of respondents from different parts of Malaysia and members of various clubs or organisations, had never made any complaints before. Most youth are already empowered to make purchasing decisions about the goods and services they buy. Furthermore, as consumers, they are also aware of the follow-up actions to be taken in the complaint process for redress and refunds if the products or services they get differ from what was stated. Nevertheless, a study shows that youths are not active in making complaints or seeking redress if there is a scam or faulty product. Empowered youths need to be more skilled in making active complaints about scams and bogus products sold in the market. In the long run, this will push for higher-quality products.*

**Keywords:** CEI among youth, consumer skills, consumer legislation, consumer engagement, cognitive domain, affective domain, practice

## INTRODUCTION

### Background

Most countries in the world are trying to continuously improve economic aspects, educational aspects, and health aspects. These three aspects are composite indicators of a country's human development index. One of the benchmarks of the three is the aspect of education, where this aspect is closely related to the quantity and quality of increasing human resources. This is one of the related variables when students in high school and university go through the education process while spending their monthly income on buying various products or services. When this process occurs, an attitude of self-empowerment as a consumer is formed, which is one of the benchmarks in the consumer empowerment index.

Malaysia is one of the countries in Southeast Asia with a good level of economic growth and Gross Domestic Product (GDP) growth. Therefore, if the GDP growth that reflects the per capita income of a country is good, it will influence the purchasing power of the community, which will ultimately result in the consumer empowerment index. This Consumer Empowerment Index (CEI) study is an effort by the Ministry of Domestic Trade and Consumer Affairs (KPDNHEP) to develop an index for Malaysia involving a more extensive scope and number of consumers to measure the level of empowerment among Malaysian consumers and to categorize their level of empowerment (Ministry of Domestic Trade and Consumer Affairs of Malaysia 2020). The index will help the Ministry quantitatively ascertain the level of empowerment of Malaysian consumers toward their rights and responsibilities while also understanding the related consumer issues that require immediate attention from the Ministry. Overall, it will help government agencies examine the effectiveness of their programmes and policies and make improvements.

This index is also specified in specific fields, such as online product purchases, as Simanjuntak (2020) states that low income can increase the consumer empowerment index. In addition to that, in the field of telecommunications, according to Putri & Simanjuntak (2022), the consumer empowerment index is relatively low. CEI in the field of education generally targets the basic needs of products that are consumed during the educational period of an individual, both in secondary schools, upper levels, and universities. The measurement here is generally done to find out and analyze the importance of the dimensions in the consumer empowerment index and whether these student consumers have exercised their rights and obligations as consumers or not.

### Problem Formulation

The formulation of the problem in this study for Malaysian youth is:

- a. What is the impact of the importance of setting short- and long-term financial goals on monthly pocket money?
- b. What is the impact of the importance of choosing the right financial product for yourself (e.g., a loan, fixed deposit, mutual fund, etc.) on monthly pocket money?
- c. What is the impact of the importance of reading the nutrition facts before buying a product on monthly pocket money?
- d. What is the impact of the importance of product exchanges or refunds on monthly pocket money?
- e. What is the impact of the importance of making a complaint about something or an advertisement that is wrong on monthly pocket money?
- f. What is the impact of the importance of making a complaint to the user body if the seller does not want to change damaged products on monthly pocket money?
- g. What is the impact of the importance of comparing prices and quality with similar products on monthly pocket money?
- i. What is the impact of the importance of consumers having knowledge of all channels to make a complaint on their monthly pocket money?

- j. What is the impact of the importance to consumers of creating or requesting assistance for a claim for damages on a purchase on monthly pocket money?

### **Research Objectives**

The purposes of this study on Malaysian youths are:

- a. to analyze the impact of the importance of setting short- and long-term financial goals on monthly pocket money.
- b. to analyze the impact of the importance of choosing the right financial product for yourself—loans and mutual funds — on monthly pocket money.
- c. to analyze the impact of the importance of reading the nutrition facts before buying a product on monthly pocket money.
- d. to analyze the impact of the importance of product exchanges or refunds on monthly pocket money.
- e. to analyze the impact of the importance of making a complaint about something or an advertisement that is wrong on monthly pocket money.
- f. to analyze the impact of the importance of making a complaint to the user body if the seller does not want to change damaged products on monthly pocket money.
- g. to analyze the impact of the importance of comparing prices and quality with similar products on monthly pocket money.
- i. to analyze the impact of the importance of consumers having knowledge of all channels to make a complaint on monthly pocket money.
- j. to analyze the impact of the importance of consumers creating or requesting assistance for a claim for damages on a purchase on monthly pocket money.

## **LITERATURE REVIEW**

### **Gross Domestic Product**

One of the indicators for measuring the prosperity of a nation is the growth of its GDP (Gross Domestic Product) from year to year, which is reflected in the per capita income of the community. Malaysia, which is one of the countries with the highest per capita income growth in Southeast Asia. A high per capita income influences the consumption pattern of the community when it spends its income to buy products or services, which is related to the consumer empowerment index. If the GDP is high, then the public's desire to consume products/services is also high, and vice versa. The following is Malaysia's GDP growth over the last 22 years.



Source: World Bank (2023).

**GRAPH 1:** Gross Domestic Product Growth of Malaysia in 2000–2022

Based on Graph 1, it is clear that, in general, Malaysia's GDP growth or per capita income tends to be stable, although there have been some fluctuating years. The year 2000, known as the millennium era, has brought the citizens of Malaysia to a GDP growth rate of 8.85%. But in 2001, it dropped drastically and stabilized again for almost 10 years, with average GDP growth above 5%. Further, in 2010, it increased drastically again, reaching 7.42%, and stabilized again in 2011 at the level of 5.29%, and this situation continued with average GDP growth above 5% until 2019, which is 4.41%.

However, in 2020, the GDP growth of the country had drastically reached -5.53%, due to the impact of COVID-19 in 2019. Further, in 2021, it began to grow again slowly, reaching 3.09%, and returned to stability and increased sharply, reaching 8.69% in 2022. It is hoped that the situation will continue to improve. A good GDP growth condition indicates a good per capita income, so that the nation's consumption pattern of products, both for basic or primary needs and secondary or tertiary goods, also improves.

### Consumer Empowerment Index

Each country has its own Consumer Empowerment Index (CEI). This CEI is a parameter that shows the level of the courage of the people of a country, both individuals and groups, as consumers who are not satisfied with the products and services they feel or feel disadvantaged in a trading activity or economic transaction (<https://www.survei-ikk.com>).

This index number is also the basis for setting policies in the field of consumer protection and measuring consumer awareness and understanding of their rights and obligations. Besides that, consumers are also expected to have the ability to interact with the markets they can reach. So it is important for the government to continue to increase this index in a country.

### *Dimensions of Consumer Empowerment Index*

According to Nardo et al. (2011), there are three dimensions of the consumer empowerment index: consumer skills, awareness of consumer legislation on consumer rights, and consumer engagement, which correspond to the three main aspects highlighted by the EU Consumer Policy Strategy. Based on the literature review, the definition of consumer empowerment was mainly drawn from two sources: social psychology and marketing literature. Both referred to the strategic role of consumers concerning producers as well as the role of information as a source of empowerment.

The operational definition of consumer empowerment mentioned in the EU Consumer Policy Strategy was used as a parameter to measure consumer empowerment. In particular, the operational

concept of empowerment was built on consumers' skills, consumers' knowledge, and consumers' assertiveness.

### 1. **Consumer skills:**

Measure the ability of consumers to perform basic arithmetic operations deemed necessary for consumers to make informed purchase decisions.

#### i. Basic financial skills

- *Identify the best interest rate for a savings or deposit account*
- *Calculation of a yearly interest on a loan*
- *Recognize cheaper product*
- *Interpret packaging information (nutritional information)*
- *Identify the expiration date of a product ("best before" date)*
- *Identify and interpret commonly used EU logos related to consumer information and protection*

### 2. **Awareness of legislation on consumer rights:**

Actual knowledge of consumers related to several EU consumer legislation related to:

- i. Unfair commercial practices
- ii. Length of guaranteed rights validity
- iii. Cooling-off period in distance or doorstep selling

### 3. **Consumer engagement:**

Different aspects of consumer behaviour.

#### i. Attitude in comparing products

- *Efforts consumers make in obtaining information on products (e.g. reading specialized consumer magazines, using internet, visit different shops)*
- *Attention to price differences*
- *Consumers' habits when reading terms and conditions during contracts signature*

#### ii. Interest in obtaining information on consumer rights

- *Pro-active attitude of consumers when looking for information on their rights*
- *Knowledge of programmes related to consumer rights - Knowledge of organizations protecting consumer rights*

#### iii. Tendency to talk

- *Attitude to talk about negative and/or positive experience*

#### iv. Detriment and redress

- *Attitude when experiencing a problem that causes a legitimate case for complaint*

## **Domains of Consumer Empowerment Index (CEI)**

CEI is used for index measurement and contains three domains:

### 1. Cognitive:

Awareness of consumer rights and responsibilities, knowledge and consumer skills take appropriate actions to avoid and resolve problems in the market.

### 2. Affective:

Psychological traits that enable an individual to act in accordance with his or her skills and abilities. The measure is based on the inner power of an empowered consumer: hope, self-efficacy, resilience, optimism, assertiveness, and impulsiveness.

### 3. Practice:

The relevant behaviours are filing complaints for bad experiences, citation frequency and involvement in consumers' activities (via experience sharing).

## RESEARCH METHOD

### Data Sampling and Research Instruments

The data used was primary data collected from students in secondary school until universities in Malaysia. The questionnaire used was from the Malaysian Consumer Empowerment Study 2019–2020, which had already been validated and tested. The data was collected using the Google Form shared through various social media platforms (Facebook, Instagram, and WhatsApp) and also shared during consumer awareness and redress programs organised for youths throughout Malaysia through online platforms (webinars and Google Meets) from 2021 to 2022. The sample was drawn from 5,319 students with *simple random sampling* in 13 states and 3 federation territories.

### Data Analysis Models

The data analysis model used quantitative analysis by using multiple linear regression. According to Gujarati and Porter (2010: 245), the multiple linear regression equation is described as follows:

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + e \quad (1)$$

Where :

- y = dependent variable
- b<sub>0</sub> = intercept (constant)
- b<sub>1</sub> = regression coefficient of x<sub>1</sub> factor
- b<sub>2</sub> = regression coefficient of x<sub>2</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>3</sub> factor
- x<sub>1</sub> = independent variable 1
- x<sub>2</sub> = independent variable 2
- x<sub>2</sub> = independent variable 2
- e = error term

Furthermore, equation (1) is to be equation (2) as follow

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + b_8 x_8 + b_9 x_9 + e \quad (2)$$

Where :

- y = Amount of monthly pocket money (RM)
- b<sub>0</sub> = intercept (constant)
- b<sub>1</sub> = regression coefficient of x<sub>1</sub> factor
- b<sub>2</sub> = regression coefficient of x<sub>2</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>3</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>4</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>5</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>6</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>7</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>8</sub> factor
- b<sub>3</sub> = regression coefficient of x<sub>9</sub> factor
- x<sub>1</sub> = The importance of setting short- and long-term financial goals (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- x<sub>2</sub> = The importance of choosing the right financial product for yourself - e.g. loan, fixed deposit, mutual fund, etc. (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- x<sub>3</sub> = The importance of reading the nutrition facts before buying a product (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)

- $x_4$  = The importance of product exchange/refund (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- $x_5$  = The importance of making a complaint about something or an advertisement that is wrong (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- $x_6$  = The importance of making a complaint to the user body if the seller does not want to exchange a damaged product (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- $x_7$  = The importance of comparing prices and quality with similar products (Likert scale, very important = 5, important = 4, moderately important = 3, slightly important = 2 and not important = 1)
- $x_8$  = Have knowledge of all channels to make a complaint (Gutmann scale, 2 = yes and 1 = no)
- $x_9$  = Create or request assistance for a claim for damages on a purchase (Gutmann scale, 2 = yes and 1 = no)
- e = error term

### Hypothesis Testing and Formulation

The hypothesis testing of the study is stated as follows:

- a.  $H_0$ ;  $\beta_1 = 0$ , it is assumed that  $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$  and  $X_9$  have no significant effect on  $Y$  among Malaysian youths.
- b.  $H_1$ ;  $\beta_1 \neq 0$ , it is assumed that the  $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$  and  $X_9$  have significant effect on  $Y$  among Malaysian youths.

The test criteria is carried out by t-test and F-test.

Therefore, the hypothesis formulation of this study for Malaysian youths is as follows:

- a. Setting short- and long-term financial goals will have a positive and significant impact on monthly pocket money.
- b. All domains of the consumer empowerment index will have a positive and significant impact on monthly pocket money.

## RESULTS AND DISCUSSION

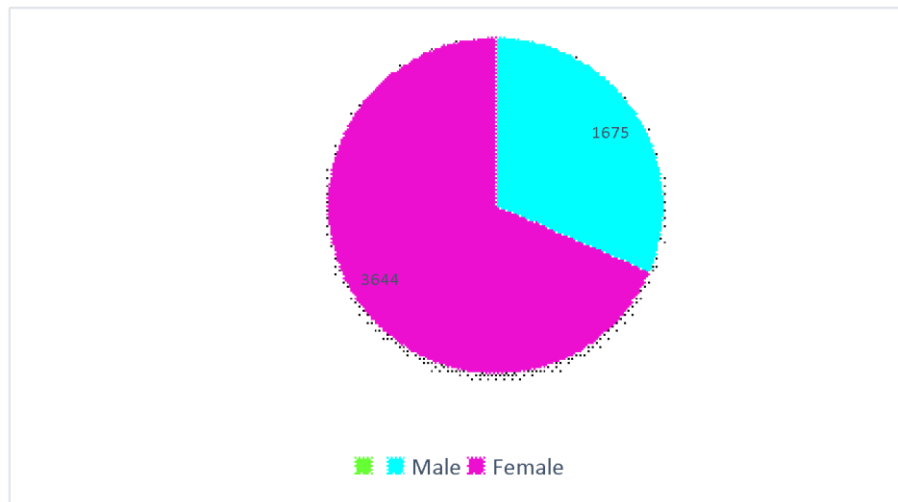
This section will detail the characteristics of the sample of Malaysian youth respondents and the analysis of the findings.

### Respondents Characteristics

Some of the characteristics of respondents in this consumer empowerment index include:

#### a. Gender

The gender of the respondents is shown in the following graph:



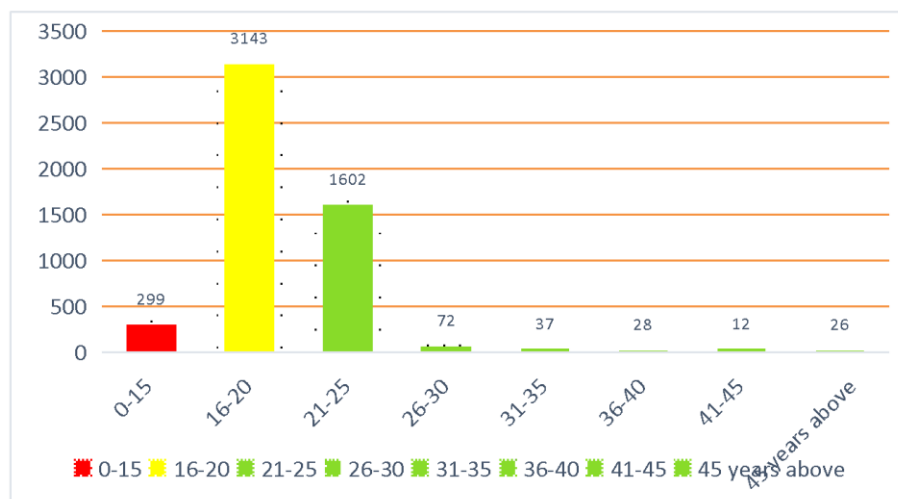
Source: Research (2022).

**GRAPH 2** Gender of Respondents, 2021-2022

Graph 2 above explains that the number of male respondents is 1,675 or 31.49% of the total of 5,319 respondents. While the student respondents were female, 3,644 people, or 68.51%. This shows that the gender group that is always related to CEI is women, where shopping and acting as consumers are dominated mainly by them.

#### b. Age

In general, based on the research results, the age of respondents who dominate CEI among students is 16–20 years old. This can be fully explained in the following graph.



Source: Research (2022)

**GRAPH 3** Age of Respondents, 2021-2022

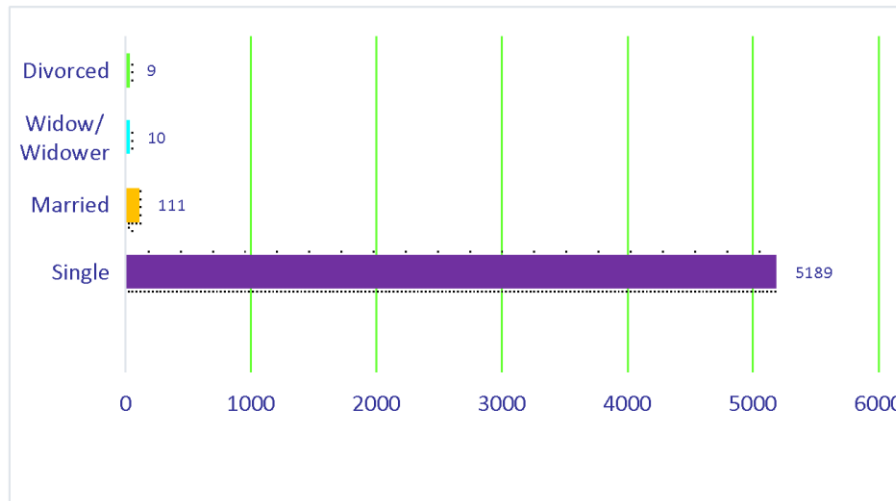
Based on graph 3, the youngest age of the respondents spread across all states is 14 years, where this age group category is 0–15 years for as many as 399 people and is the age of the respondents in high school as consumers who are classified as empowered in shopping and choosing products from the side of basic needs as a student. The oldest age group is over 45 years old, with as many as 26 people, or 0.48%, who are master's or doctoral students at public or private universities in Malaysia. Furthermore, the age group of 16–20 years is the largest age group of respondents, namely 3,143 people.



Then followed the 21–25 year-old group with 1,602 respondents, and the age distribution of the other groups can be seen in the above graph.

**c. Marital Status**

The marital status of respondents is categorized into four (4) types, as shown in graph 4 below.



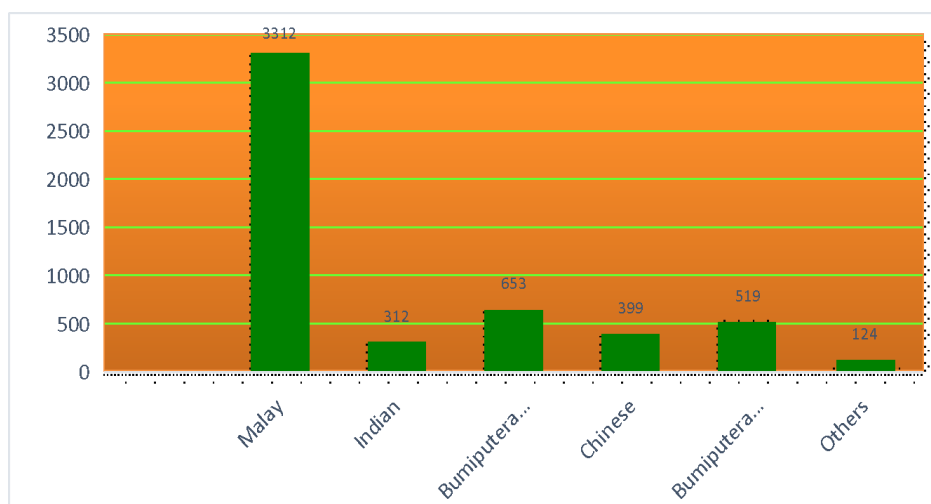
Source: Research (2022)

**GRAPH 4** Marital Status of Respondents, 2021–2022,

Based on graph 4 above, it can be explained that the marital status of respondents consists of 5,189 singles, or 97.55%; 111 married, or 2.08%; 10 widows or widowers; and 9 divorced, with percentages of 0.18% and 0.16%, respectively.

**d. Ethnicity**

The characteristics of the respondents based on ethnicity can be seen in the following graph.



Source: Research (2022).

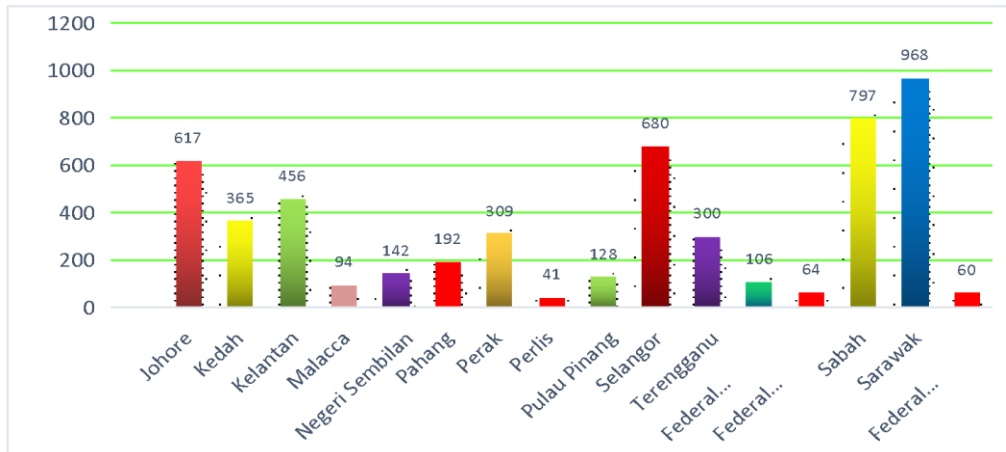
**GRAPH 5:** Respondents' Ethnicity, 2021-2022

Based on ethnicity, in graph 5 above, the total number of respondents is dominated by the Malay race, with as many as 3312 people, or 62.26%, followed by Bumiputera Sabah (653 people) and

Bumiputera Sarawak (519 people), with 12.27% and 9.75%, respectively. While China had 399 people and the Indians had 312 people, the others had 124 people, or 2.33%.

**e. Residence**

The respondents' residences are spread across all the states in Malaysia, as can be seen in the following graph.



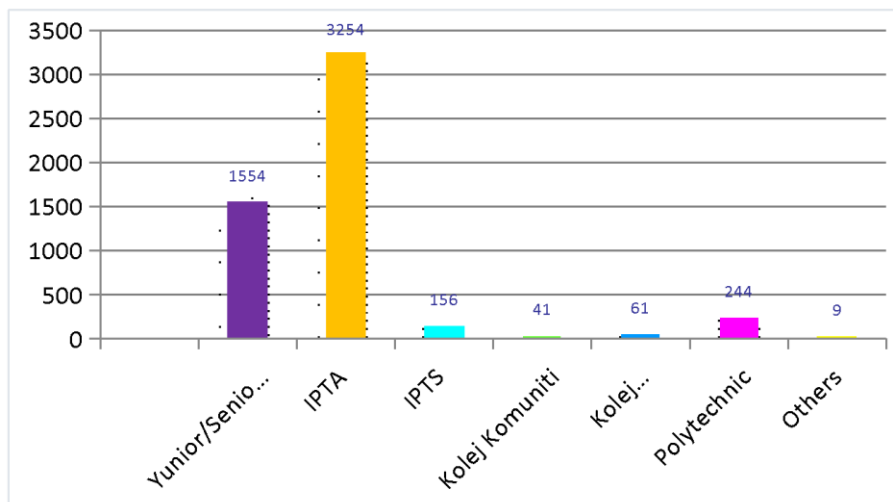
Source: Research(2022).

**GRAPH 6** Residence of Malaysian Youth Respondents, 2021-2022

Based on the respondents' residence, the majority live in the Sarawak region, with as many as 968 students, followed by Sabah with 797 people, Selangor with 680 people, and Johor with 617 students. This is not excessive considering that the district has the most educational institutions. While the respondents who live in the Perlis district are only 0.77%, or 41 people, the Federal Territory of Labuan has 60 people, or 60%. Federal Territory of Putrajaya by 1.20%, or 64 people, and Melaka by 94 people, or 1.76%. Respondents in the area are less than 100; the area is the center of government and tourism, so there is minimal education there.

**f. Educational Background**

The educational background of the respondents is shown in Graph 7.



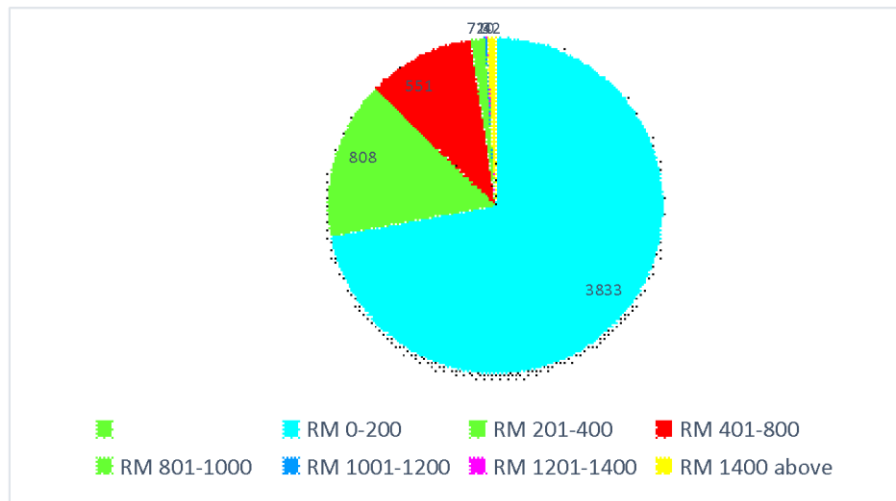
Source: Research (2021–2022).

**GRAPH 7** Educational Background of Respondents 2021–2022

Graph 7 shows that the majority of the respondents are from tertiary education (61.17%, or 3254 respondents) and secondary school (38.83%, or 1554 respondents).

**g. Monthly Pocket Money**

The pocket money here explains the amount of pocket money students have during one month of education, which can be explained in the following graph:



Source: Research (2021-2022).

Graph 8 Monthly Pocket Money among Malaysian Youths, 2021-2022

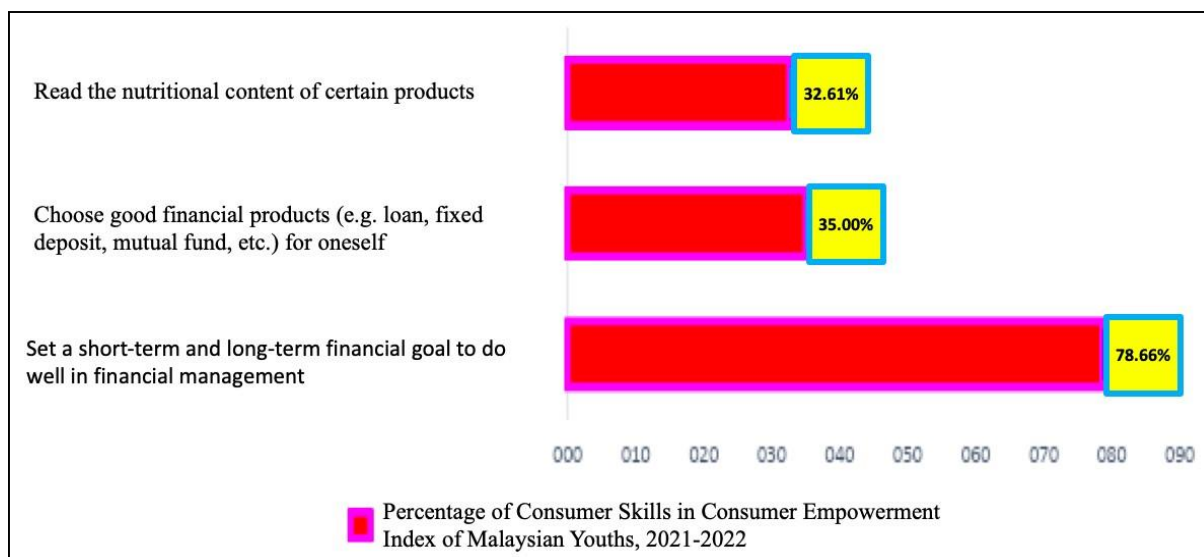
Graph 8 above explains that most of the 3,833 respondents had a monthly allocation of their pocket money spent to buy products, with an average of RM 200. Then followed a group with monthly spending of RM 200–400 with 808 respondents and RM 401–800 with as many as 551 respondents. The level of monthly allocation of costs/monthly pocket money is generally closely related to the level of education of the respondents. The higher the respondent's level of education, the more pocket money there is, which is the monthly allocation and is used for needs. This is related to consumer empowerment, as noted by Son & Park (2019), who noted that there is a difference between respondents with high, middle, and low incomes as reflected by their monthly pocket money.

**Consumer Empowerment Index of Malaysian Youths**

The dimensions of the Consumer Empowerment Index used in this research involving 5,319 respondents consist of three (3), namely, consumer skills, awareness of consumer legislation on consumer rights, and consumer engagement.

**a. Consumer Skills**

Consumer skills consist of basic knowledge about consumer skills and the capacity to read product labels and contents. This research is limited to financial setting skills, knowledge of choosing financial products for oneself, and knowledge or awareness of reading the nutritional content of products, which can be explained as follows:



Source: Research (2021-2022)

**GRAPH 9** Consumer Skills in Consumer Empowerment Index of Malaysian Youths, 2021-2022

Based on Graph 2 above, according to 78.66 percent of respondents (4,184 respondents), it is very important to set short-term and long-term financial goals to do well in financial management. A total of 820 respondents stated it was important (15.41%), and 282 respondents, or 5.30%, stated it was moderately important. In contrast, 22 respondents and 11 people stated that it was slightly important or very slightly important.

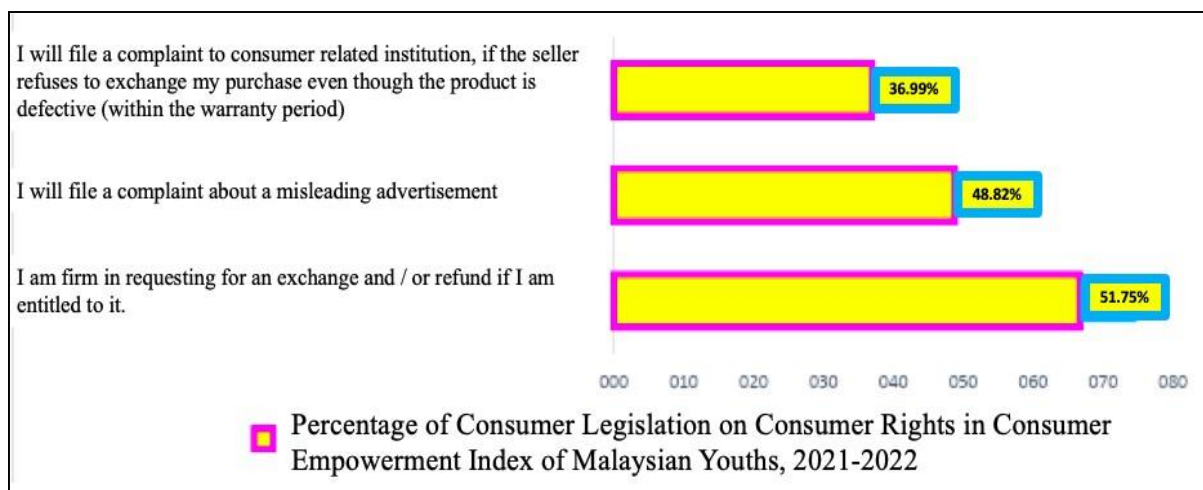
Then, on the side of the need to choose good financial products (e.g., loans, fixed deposits, mutual funds, etc.) for oneself, 35.0% or 1,862 respondents have very good knowledge in choosing them, 30.08% or 1,600 respondents stated good, and 17.48% or 930 respondents said very good.

Furthermore, the importance of consumers reading the nutritional content of products is 32.61%, or 1,735 respondents, who stated that it is very important to know the nutritional content, 29.17%, or 1,552 respondents, who stated that it is important, and 1,552, or 29.08%, who stated that it is moderately important. While the remaining 390 and 95 respondents stated that it was slightly important or not important.

Based on the above dimension, it is clear that the consumer empowerment index is judged to be good from the dimension of consumer skill, having a level of self-empowerment in consuming products.

#### **b. Awareness of Consumer Legislation on Consumer Rights**

The dimension of consumer awareness of the legislation on consumer rights refers to actions taken by consumers as a result of unfair trade practices, and the warranty period after the purchase of the product is reflected in the firmness and expectations of the consumer, which can further be explained in the following graph:



Source: Research (2021–2022).

**GRAPH 10** Awareness of Consumer Legislation on Consumer Rights in Consumer Empowerment Index of Malaysian Youths, 2021-2022

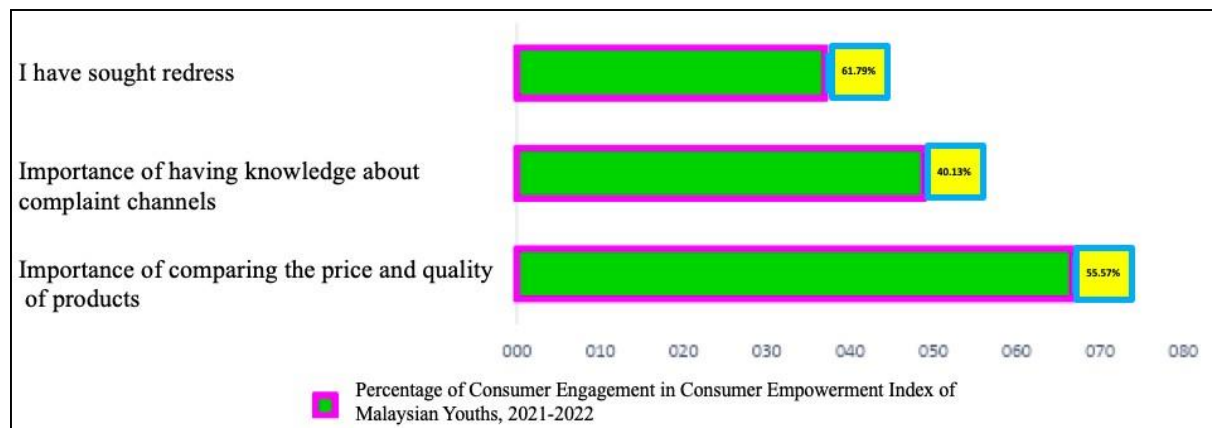
Based on graph 10, the results of the dimension of awareness of consumer legislation on the importance of requesting exchange and return service from the consumer to the seller or other parties are good. This is reflected in 2,753 respondents, or 51.75%, stating that it is important to file the complaint. The sequence is very important, and there is no response from the respondents, which indicates that asking for service back is something taboo or prestigious for the Malaysian community. While 40.96%, or 2,179 respondents, stated that it was important enough to exchange goods or return services to the seller,

On the importance of making complaints about misleading advertisements, as many as 2,597 respondents, or 48.82%, said it was very important to make a complaint, and 2,291 respondents said it was moderately important to make a complaint.

Furthermore, from the point of view of the importance of making a complaint if the seller does not want to exchange the damaged item, 36.99%, or 1,968 respondents, stated that it is very important to make a complaint if the seller does not want to exchange the item that has been damaged. Followed by 28.06%, or 1,493 respondents, and 22.24%, or 1,183 respondents, who each stated that it is important and moderately important when making a complaint if the seller does not replace the damaged item sold.

**c. Consumer Engagement**

Consumer engagement refers to actions taken by consumers by comparing products, making compensation, and exchanging positive and negative experiences, as well as their involvement in activities as consumers. The following are the results of research on the dimension of consumer engagement, which is explained in the following graph:



Source: Research (2022).

**GRAPH 11** Consumer Engagement in Consumer Empowerment Index of Malaysian Youths, 2021-2022

Based on research results from the dimension of consumer engagement on the importance of comparing the price and quality of products, 55.57%, or 2,956 respondents, stated that it is very important to compare them, and 30.13%, or 1,603 respondents, stated that it is important.

Furthermore, from the point of view of the importance of having knowledge about complaint channels, none of the respondents considered this very important to know. Nevertheless, a total of 2,135 respondents, or 40.13%, said it was moderately important, 38.74% said it was slightly important, and only 727 respondents, or 13.66%, said it was important to have knowledge of complaint channels.

Lastly, from the consumer's perception of redress, a total of 61.79%, or 3,287 youths, said they had never made any complaints before, and 38.20%, or 2,032 respondents, have ever made compensation requests to the seller or any other channel.

### Multiple Linear Regression Analysis

**TABLE 12** Multiple Linear Regression Analysis of CEI in Malaysia in 2023

No.	Variable	Estimation Coefficient
1.	Constant	-51.190
2.	setting short- and long term finance ( $X_1$ )	60.681
3.	choosing the right financial product for yourself, loans ( $X_2$ )	-12.193
4.	Reading the nutrition facts before buying a product ( $X_3$ )	-15.620
5.	Product exchange/refund ( $X_4$ )	10.866
6.	Making a complaint about something or an advertisement if it is wrong ( $X_5$ )	8.074
7.	Making a complaint to the user body if the seller does not want to exchange damaged products ( $X_6$ )	-53.594
8.	Comparing prices and quality with similar products ( $X_7$ )	39.148
9.	Have knowledge of all channels to make a complaint ( $X_8$ )	14.782
10.	Create or request assistance for a claim for damages on a purchase ( $X_9$ )	17.632
11.	Correlation coefficient	0.046

12. Coefficient of determinants	0.002
---------------------------------	-------

Source : Result of research (2022).

Based on Table 4, the regression equation is obtained as follows:

$$Y = -51.190 + 60.681X_1 - 12.193X_2 - 15.620X_3 + 10.866X_4 + 8.074X_5 - 53.594X_6 + 39.148X_7 + 14.782X_8 + 17.632X_9 + e \quad (3)$$

The multiple linear regression equation can be interpreted as follows:

a. Constant

The constant value is -51.190, which means that if all domains of the consumer empowerment index in this research are equal to zero, then the pocket money, Y, is decreased by 51.190.

b. The importance of setting short- and long-term financial goals (variable coefficient)

The coefficient value is 60.681, which means that if the setting of short- and long-term financial goals increases by 1 level, the monthly pocket money will increase by 60.681. This is in accordance with the fact that setting short- and long-term financial goals has a strong impact on monthly pocket money.

Other variable coefficients that have a positive value are:

1. product exchange/refund ( $X_4$ ) 10.866
2. Making a complaint about something or an advertisement if it is wrong ( $X_5$ ), 8.074
3. Comparing prices and quality with similar products ( $X_7$ ), 39.148
4. Have knowledge of all channels to make a complaint ( $X_8$ ), 14.782
5. Create or request assistance for a claim for damages on a purchase ( $X_9$ ), 17.632

### *Analysis of the Correlation Coefficient*

A correlation coefficient (R) of 0.046 means that there is a low relationship between all domains in the consumer empowerment index on monthly pocket money.

### *Coefficient of Determination Analysis*

The value of the determinants' coefficient is 0.002, which means that all domains in the consumer empowerment index impact the monthly pocket money of students to buy products by 0.2 percent. Meanwhile, the remaining 99.8 percent is contributed by other variables outside the model.

### *Value of T-Test and F-Test*

- a. The t-test for the importance of setting short- and long-term financial goals ( $X_1$ ) with  $t_{\text{value}} = 1.486$  is significant at  $\alpha = 5\%$  (0.137).
- b. The importance of making a complaint to the consumer body if the seller does not want to change a damaged product ( $X_6$ ) with t-value of -2.545 and significance at  $\alpha = 5\%$  with 0.011 value of significance.
- c. From the F-test, the F-value is 1.223 and not significant for  $\alpha = 5\%$  level of significance at 0.269.

## **CONCLUSIONS**

The main conclusions drawn from the study are:

- A. Consumer Empowerment Index of Malaysian youths Based on the three (3) dimensions of CEI, the results are:
1. Consumer skills 78.66%
  2. Awareness of consumer legislation on consumer rights 51.75%
  3. Consumer engagement 55.57%
- And the overall CEI value is 61.99% for the 2021–2022 period. This is a moderate CEI level and same level of the National CEI for Malaysia in 2019-2020, which was 63.1 %.
- B. Regression Analysis
- a. The importance of setting short- and long-term financial goals ( $X_1$ ) significantly affects the monthly pocket money of Malaysian youths.
  - b. The importance of making a complaint to the consumer body if the seller does not want to change a damaged product ( $X_6$ ) significantly affects the monthly pocket money of Malaysian youths.
  - c. The other domains of the consumer empowerment index do not significantly affect the monthly pocket money of Malaysian youths.

### Suggestions

- a. The importance of applying understanding at the high school and college levels is carried out by the institution on the importance of consumer empowerment.
- b. The need for socialization from the Malaysian government through the Ministry of Trade on the importance of consumer rights and obligations, especially to students, will ultimately increase the consumer empowerment index in the field of education and ultimately increase the value of Malaysia's own consumer empowerment index in the future.

### ACKNOWLEDGEMENTS

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# **ECONOMIC VULNERABILITY ASSESSMENT OF COASTAL COMMUNITY HOUSEHOLDS TO CLIMATE CHANGE: GENDER DIMENSIONS**

*(PENILAIAN KERENTANAN EKONOMI ISI RUMAH KOMUNITI PERSISIR PANTAI  
TERHADAP PERUBAHAN IKLIM: DIMENSI JANTINA)*

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## **ABSTRACT**

*Climate change is a global phenomenon that has caused grave concern for numerous economic sectors and livelihoods, primarily in coastal community regions. Vulnerability to climate change has been identified as a significant cog in the wheels of both livelihood and resilience, especially for vulnerable populations in coastal areas. Various vulnerability assessment studies have disclosed the impact of climate change on coastal communities, however very few of this research evaluate the economic vulnerability of coastal households on the basis of gender dimensions. This research aims to address this deficiency by investigating the economic vulnerability of impoverished coastal community households using a framework for vulnerability assessment based on an Intergovernmental Panel on Climate Change (IPCC) approved methodology. The study assesses households in terms of the gender dimensions of household members. An overall picture of the economic vulnerability of communities in Kuala Gula to climate change was presented using the Economic Vulnerability Index (EVI) approach. A total of 215 male and 185 female member households from Kuala Gula, the district of Kerian, Perak were selected for analysis. Using closed-ended questionnaires, data for three EVI components (Exposure, Sensitivity, and Adaptive Capacity) are collected from household members. The results revealed a statistically significant difference between the major, sub-components and vulnerability index of male and female household members. High indices for exposure and sensitivity and moderate adaptive capacity of Male Household Members (MHM) while high indices for exposure and sensitivity and low adaptive capacity of Female Household Members (FHM) in relation to climate change. This study will help to develop climate change vulnerability strategies that address gender dimensions. This pragmatic approach can be used to monitor gender vulnerability dimension and the enhancement of livelihoods, as well as to evaluate potential climate change adaptation programs. In a data-scarce coastal area like Malaysia, IPCC-LVI as a baseline instrument would increase gender resilience and adaptive capacity data for policy effectiveness.*

*Keywords: Climate Change; Economic Vulnerability Index; Knowledge; Awareness; Coastal Community Households; Gender Dimensions*

## **ABSTRAK**

Persidangan Kebangsaan Ekonomi Malaysia ke 16 (PERKEM 16),  
“Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik”  
Pulau Pinang, 5 Ogos 2023

Perubahan iklim merupakan fenomena global yang telah menyebabkan kebimbangan yang serius terhadap pelbagai sektor ekonomi dan mata pencarian, terutamanya di kawasan persisir pantai. Kerentanan kepada perubahan iklim telah dikenal pasti sebagai faktor penting dalam roda kehidupan dan daya tahan, terutamanya bagi populasi yang terdedah di kawasan pantai. Pelbagai kajian penilaian kerentanan telah mendedahkan kesan perubahan iklim terhadap komuniti pantai, namun sangat sedikit daripada penyelidikan ini menilai kerentanan ekonomi isi rumah persisir pantai berdasarkan dimensi jantina. Penyelidikan ini bertujuan untuk menangani jurang kekurangan tersebut dengan menilai kerentanan ekonomi isi rumah komuniti pesisir pantai yang berbeza berpendapatan menggunakan rangka kerja untuk penilaian kerentanan berdasarkan metodologi Panel Antara Kerajaan mengenai Perubahan Iklim (IPCC) yang diluluskan oleh IPCC. Kajian ini menilai isi rumah dari segi dimensi jantina ahli isi rumah penduduk di Kuala Gula. Gambaran keseluruhan tentang kerentanan ekonomi masyarakat di Kuala Gula terhadap perubahan iklim telah dibentangkan menggunakan pendekatan Indeks Kerentanan Ekonomi (EVI). Sebanyak 215 ahli isi rumah lelaki dan 185 wanita dari Kuala Gula, daerah Kerian, Perak telah dipilih untuk analisis. Kajian ini menggunakan soal selidik tertutup, data untuk tiga komponen EVI (Pendedahan, Sensitiviti dan Kapasiti Penyesuaian) dikumpul daripada ahli isi rumah. Keputusan menunjukkan perbezaan yang signifikan secara statistik antara komponen utama dan sub-komponen dan indeks kerentanan ahli isi rumah lelaki dan wanita. Ahli isi rumah lelaki (MHM) mempunyai indeks yang tinggi untuk pendedahan, sensitiviti dan indeks yang sederhana bagi kapasiti penyesuaian, manakala ahli isi rumah wanita (FHM) mempunyai indeks yang tinggi untuk pendedahan dan juga sensitiviti dan indeks yang agak rendah bagi kapasiti penyesuaian terhadap perubahan iklim. Hasil daripada dapatan kajian ini akan membantu membangunkan strategi kerentanan perubahan iklim yang menangani dimensi jantina. Pendekatan pragmatik ini boleh digunakan untuk memantau dimensi kerentanan jantina dan peningkatan mata pencarian isi rumah, serta menilai program penyesuaian perubahan iklim yang berpotensi. Di samping itu, pengenalan IPCC-LVI sebagai instrumen asas akan menambah baik maklumat tentang daya tahan jantina dan kapasiti penyesuaian untuk keberkesanan dasar di wilayah pantai yang kekurangan data, terutamanya Malaysia.

*Kata kunci: Perubahan iklim; Indeks Keterdedahan Ekonomi; Pengetahuan; Kesedaran; Isi Rumah Komuniti Pesisir Pantai; Dimensi Jantina*

## INTRODUCTION

Climate change refers to long-term alterations in global or regional weather patterns, such as temperature, precipitation, and wind patterns. Variable-frequency and -intensity extreme weather events characterize the manifestations of climate change (Banholzer et al., 2014). Coastal communities experience particular obstacles and hazards from climate change due to their geographical location and the interaction of multiple factors. Important aspects of climate change affecting coastal communities, such as sea level rise, coastal inundation and storm surges, erosion and loss of coastal habitats, salinization of freshwater resources, and displacement and migration. In addition, coastal communities are among the most susceptible to climate change, with 23% of the world's population living within 100 km of the coast (C. Small & R.J. Nicholls, 2003) and the sea level expected to increase between 43 and 84 cm by the end of the 21st century (M. Oppenheimer et al., 2019). Apart, they are also plagued by the side effects of these risks (D. Mahmoodzadeh & M. Karamouz, 2017). Further, the coastal community is especially vulnerable to economic losses because of its geographic (S. Jeong & Yoon, 2018) and socioeconomic characteristics, which make it highly exposed to climate change-related adversity, and because the threats caused by the increase in climate-related hazards are exacerbated by the loss of fish harvest in the oceans resulting from human-induced climate change (C.M. Free et al., 2019; E.C.J. Oliver et al., 2018; M.L. Perez et al., 2013; S.C. Doney et al., 2020). Extreme events such as intense wind and waves pose the greatest threat to coastal communities in terms of the effects of natural factors

Further, Norzaida et al. (2017) stated that heat waves in Europe, severe flooding in Asia, and both droughts and floods on the African continent are all signs of the increasing severity and effects of climate change. Damages to the physical infrastructure of coastal communities are the most apparent

consequences of extreme events. Apart, Amiruddin (2023), studies indicate that climate change caused the average sea level rise in Malaysia has increased by more than 0.1 meters since 1993 and it is anticipated that the rate will accelerate and reach 1 meter by 2100 and the most concerning and costly effects of climate change that impacts the sustainable development of Malaysian coastal areas. Studies on climate change indicate temperature rises and changes to rainfall patterns, particularly in Malaysia (Norzaida et al., 2017). Several scientific studies have been conducted to comprehend, analyze, and forecast changes in Malaysia's climatic circumstances (A.H. Syafrina et al., 2017; Juneng et al., 2008; Norzaida et al., 2016; Zalina et al., 2014). Several studies have demonstrated that the intensity and magnitude of the two monsoon seasons, the North-east monsoon and the South-west monsoon, have changed. Strong winds, heavy rains, high waves, and droughts are all results of the increasing frequency of severe occurrences. Among the most catastrophic calamities to strike Malaysia were the tsunami in 2004, the massive floods in 2006, and most recently, the earthquake in 2014. The monetary loss is in the billions. Losses of lives, property, and for some, the loss of a source of income, are realities that must be faced with. Flood damage is projected at a modest \$500 million annually (Tangang et al., 2008).

Additionally, Global Environment Centre (2020), 61% of Perak's 250 km of coastline has eroded over the last several years as a result of rising sea levels and more storms that are expected to occur as a result of climate change. Moreover, the Kuala Gula shoreline is categorized by the Perak State Structural Plan 2040 as a Resources Retention Zone and is regarded as an Environmentally Sensitive Area (ESA) level 1 that faces a catastrophe risk from coastal erosion. Likewise, Kuala Gula's wastewater pollution is becoming worse (GEC, 2020). However, a specific socioeconomic significance exists in the coastline zone of Kuala Gula as the hub of Kuala Gula's economic activities, which include agriculture, fishing, and recreation, it provides for a sizable portion of the population (between 60% and 70%). Besides, Kuala Gula is one of Malaysia's most productive ecosystems and is significant from an ecological, economic, and cultural standpoint. The life of the local inhabitants is supported by its fishing industry. This has a strong likelihood of decreasing the value of the local environment indirectly. Aside from the shrinking mangrove cover, other troubling aspects include the loss of its biodiversity and its economic significance.

According to the UNDRR (2022), vulnerability refers to the circumstances determined by physical, social, economic, and environmental factors or processes which increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards. Besides, a system's level of vulnerability refers to the extent to which it is susceptible to or incapable of coping with the negative effects of climate change (IPCC, 2014). In addition, Adger et al. (2007), vulnerability may be defined as the tendency of ecological and human systems to incur damage as well as their capacity to adapt to pressures brought on by the consequences of climate change. The vulnerability of coastal populations to climate change impacts such sea level rise (Jochen Hinkel & Richard J.T. Klein, 2009), storm surges, and cyclones (M.N. Hossain, 2015; S. Nayak & P.K. Bhaskaran, 2014), as well as their management (S. McLaughlin et al., 2010), has been measured in a number of studies. Aside from that, index-based methods are extensively employed for vulnerability assessments (D. Felsenstein & M. Lichter, 2014; E.A. Pendleton et al., 2010) in both macro- and micro-level studies (P. Guillaumont, 2011; L. Briguglio, 2003). Meanwhile, Guillaumont (2008) found that economic vulnerability is the probability that exogenous unanticipated occurrences, often known as external shocks, would impede a nation's economic growth process.

Studies on the livelihood and coastal vulnerability of coastal community households have been successfully conducted in the past, and a number of studies have examined gendered roles and livelihood activities in the fishing industry (A. Thorpe et al., 2014; K. Bradford, 2019; P. Salmi & Sonck-Rautio, 2018). A gender-focused study has been omitted from the bulk of climate change research, including those that concentrate on the Millennium Development Goals (MDGs) and the sustainability nexus (Mfune et al., 2007; Reid et al., 2007). Besides, prior research on climate change typically emphasizes reducing poverty while omitting to include the gender-vulnerability connection factor to climate change taking into consideration the sustainable livelihood strategy in adaptation and mitigation action plans (Basiru et al., 2022). However, very few studies have examined the economic vulnerability of coastal households due to climate change in regards to gender dimension. Hence, the purpose of this research is to associate the gender component to the economic vulnerability specifically of household members in Kuala Gula. The vulnerability of Kuala Gula household members to climate change was determined by measuring their exposure, sensitivity, and adaptive capacity in relation to

the economic value with gender dimensions caused by climate change in the Kuala Gula coastline area using economic vulnerability index approach. The definition of economic vulnerability is a community that is inadequate for the effects of climate change due to a lack of financial resources (Sarkodie et al., 2022). Additionally, Hertel et al. (2010) synthesized the two definitions, characterizing climate change vulnerability as dynamic, locally specific, and manifested along gender, social, and poverty lines.

Men and women are affected differently by climate change based on their gender-based roles (U. Roehr, 2007a), with women being the most affected (T. Daw et al., 2009). Additionally, Sreya et al. (2021) stated that female headed household were more economically vulnerable than male-headed households in the study conducted in Southern India. Given this background, this research makes the following contributions to the body of knowledge: First, as opposed to the previous research, which concentrated solely on the gender and household headed, the study focuses on the economic vulnerability assessment of intra-household coastal community or member of households in terms of gender dimension. Second, we developed the integrated indicators of exposure (E), sensitivity (S), and adaptive capacity (AC) highlighting the level of knowledge and awareness regarding climate change under the major component of exposure, economic and quality of life factors under sensitivity, and educational and income level under adaptive capacity in order to provide a comprehensive assessment of the economic vulnerability of the study area. The subsequent recommendations can be applicable for establishing gender-specific levels of climate change vulnerability, sensitivity, and adaptability. This would be crucial in developing strategies to cater for the particular requirements of gender categories in lowering vulnerability to climate change as a strategy to create and carry out National Adaptation Plan for combating climate change as well as serving as alternative entry points for better understanding and action of implementing the Sustainable Development Goals (SDGs), specifically SDG 1 (Poverty), SDG 4 (Education), SDG 5 (Gender equality), SDG 8 (Economic growth), and SDG 13 (Climate Action).

## LITERATURE REVIEW

According to IPCC (2007) on fourth assessment report (AR4), vulnerability is the function of exposure, sensitivity and adaptive capacity. Environmental, physical, economic, and social variables were defined as four internal vulnerability factors (UNDRR, 2004). However, measuring economic vulnerability is complex (Kamanou & Morduch, 2002). It necessitates the estimation of a future economic state based on the measurement of known hazards and protective factors, or sources of resilience. Although there is a substantial body of literature on the sources of economic or livelihood vulnerability arising from the Sustainable Livelihoods tradition, there are too many unique sources of risk for a single measure to quantify them all (PEPFAR, 2017). The degree to which a territory is vulnerable to economic growth relies heavily on its wealth, since poverty reduces a region's capacity for adaptation (Watson et al., 1998). Although they are connected, poverty and vulnerability are distinct ideas; yet, the most vulnerable are often those who are least able to protect themselves (Moser & C., 1998). Due to its direct connection to resource availability, poverty is a crucial component of vulnerability. Poverty affects vulnerability by lowering resilience to consequences and influencing how well people can invest and mitigate risks. It also has an influence on how well people can cope with and recover from catastrophic occurrences (Adger & W.N., 1999). Aside from that, economic vulnerability assessments differed across genders owing to differences in economic position between men and women.

As remarked by U. Roehr (2007b), the effects of climate change on men and women differ based on their gender roles. Gender is a significant determinant in determining climate-related vulnerability (Omolo & Mafongoya, 2019). Women's vulnerability is exacerbated by a lack of accessibility to and influence over fundamental resources, as well as a lack of entitlements, (Denton & F., 2002; Sultana & F., 2014). Various studies have highlighted and advocated that including women in climate change prevention and adaptation from the grassroots to the national level would go a long way towards resolving gender inequality and vulnerability issues (Brody et al., 2008; Dankelman et al., 2008; Nellemann et al., 2011). Besides, Basiru et al. (2022), women were more vulnerable towards to climate change and variability in Cross River State, Nigeria. In addition, S. Bhadra (2017) noted that women's vulnerability to disasters is linked to their generally lower socioeconomic status. As found by M. Flatø et al. (2017), households with a single head who can be recognized based on residence or

employment status are more susceptible to climate change than those with two adults as the heads. Due to lower beginning wages and, to a lesser degree, other household factors that contribute to economic disadvantages, single male-headed households are more vulnerable. Furthermore, as added by the authors, female-headed households continue to be at risk when the income-dynamic effects of rainfall are taken into consideration. Apart, as stated by N. Omolo and P.L. Mafongoya (2019), women in Kenya were more vulnerable in regards to climate change.

Meanwhile, in order to develop the economic vulnerability assessments there are three major components that involved namely exposure (E), sensitivity (S) and adaptive capacity (AC). Previous study that had been conducted by Sreya et al. (2021) stated that female-headed households were found to be more vulnerable in terms of exposure sensitivity and adaptive capability as compared to male headed households. From the authors' study, they had developed several indicators under exposure components namely extreme weather events affected in past 6 years, losses suffered from the disasters that affected the household and recovery status of households from the disasters. Many male heads claimed to have experienced storms when out at sea fishing (Sreya et al., 2021). Female heads were not affected by these occurrences since none female surveyed actively participated in fishing. This was due to the fact that the majority of males in Kerala engaged in fishing, while women tended to concentrate on fisheries-related occupations. Male headed households were thus shown to be more exposed. However, the fishermen in Kerala suffered the most due to their low income position since the 1950s (L. Gulati, 1981). According to F. Noor Khan et al. (2018), the frequency of severe weather events has increased the dread and susceptibility of fisher women to climatic hazards, which disproportionately impact fishermen more than non-fishers. These incidents caused male-headed households to lose more money than female-headed households did (Sreya et al., 2021). Future sea level rise and severe weather events are predicted to cause an increase in losses from floods and cyclones (L.M. Bouwer, 2013a; S.A. Kulp & B.H. Strauss, 2019). Apart, as noted by J.E. Baez et al. (2020) claim that households affected by catastrophic weather events saw an increase in poverty. M.S. Rahman (2013) stated that, the economically vulnerable women were the most impacted by economic losses from catastrophes, which is consistent with this.

Further, sensitivity components describe how much a community or individual might suffer as a result of a climate-related tragedy. As remarked by Sreya et al. (2021), female headed were more sensitive in regards to the effect of climate change. A number of households with male heads admitted that despite having poor incomes and a variety of problems in the industry, they had traditionally relied on fishing for their living because of the emotional attachment they had to it (V. Priya & S.K. Sreeranganadhan, 2018). Besides, 20-35% of extra income may be added to primary income if it is diversified, particularly in the case of off-farm revenue (Azhar & B.A., 1995). Apart, according to Sreya et al. (2021), basic utility means how well-off the household is in providing for its essential necessities, such as food, housing, education, and medical care. Fishermen are constantly striving to improve their skills, so they must be pleased with the amount of wealth they experience as a result of their profession and income, despite the fact that government assistance enhances their quality of life (Ghani et al., 2017). Small-scale littoral households, regardless of their leadership, laboured to meet their daily needs for food and shelter. While there were numerous relatively well-off households in the category of male-headed households, there were hardly any in the category of female-headed households (Sreya et al., 2021). Female-headed households differed from male-headed households socioeconomically and were significantly more likely to be impoverished (R. Barros et al., 1997; S. Kossoudji & E. Mueller, 1983)

Adaptive capacity, on the other hand, is the capacity of systems, institutions, humans, and other organisms to adapt to potential danger by grasping opportunities and responding to the ensuing consequences. Thus, increasing adaptive capacity improves a system's ability to adapt to varying climate ranges and intensities (Smit & Wandel, 2006). In general, the fisher community had poor educational standards, which limited their ability to take on other jobs to some degree (Sreya et al., 2021). Although there are no current, reliable estimates of literacy levels in this research region, there is universal agreement that they are significantly lower than those that have been officially documented (Dehlavi et al., 2012). In addition, according to Ospina et al. (2010), ownership of varied, excess, and replaceable assets is essential for improved adaptive capability. Besides, in terms of natural and human resources, certification (and trainings) and property possessed by households are seen to be of critical relevance for measuring the adaptation capability (Piya et al., 2012). The type of housing (previously discussed under infrastructure) is among the physical assets. Further, low fisher income leads to low

economic status, limited social support or pension systems, poor health and living conditions for their families and restricting and preventing the implementation of adaption techniques to counteract severe environmental conditions and occurrences (Alam & Mallick, 2022; Béné, 2009; Katherine M. Maltby, 2022; Muallil et al., 2011). Salik and Majeed (2015), The Keti Bandar community's income diversification, education level, and infrastructure (access to basic utilities) indicate inadequate adaptive capability and high vulnerability.

In summary, in order to assess the economic vulnerability of Kuala Gula in relation to climate change, this study focused on male and female household members. The members of a household, such as parents and children, a husband and wife, grandparents, and other relatives, reside in the same residence. Apart, in order to develop the economic vulnerability index for the Kuala Gula coastal households, we developed several indicators which place an emphasis on environmental and economic factors. Exposure index were made up by several indicators namely knowledge, awareness and previous experiences among Kuala Gula households. According to Buloshi and Ramadan (2015), the public's awareness and knowledge of climate change constitute essential context for addressing climate change and related issues. Despite some gaps in knowledge about the causes and prevention of climate change, public awareness of the issue is fairly high. Apart, in term of prior experiences in regard to climate changes, the climate related hazard that the coastal communities often experienced such as flood and cyclones (Jahan et al., 2015; Nelson et al., 2022), lightning and huge storms (Diouf & Ouedraogo, 2020; Katherine M. Maltby, 2022; Martins & Gasalla, 2018), intense wind (M Muktha et al., 2016) erosion (de Longueville et al., 2020; Diouf & Ouedraogo, 2020), sea turbulence (Hasan & Nursey-Bray, 2017; Martins & Gasalla, 2018), sea level rise (Hasan & Nursey-Bray, 2017; Macusi et al., 2021), increased salinity of sea surface water (Alam & Mallick, 2022), temperature (Tiller & Richards, 2018), droughts (Mendez-Lazaro et al., 2018; Torres-Valcárcel et al., 2014) and rainfall changes as the effect of climate related hazards (Hasan & Nursey-Bray, 2017).

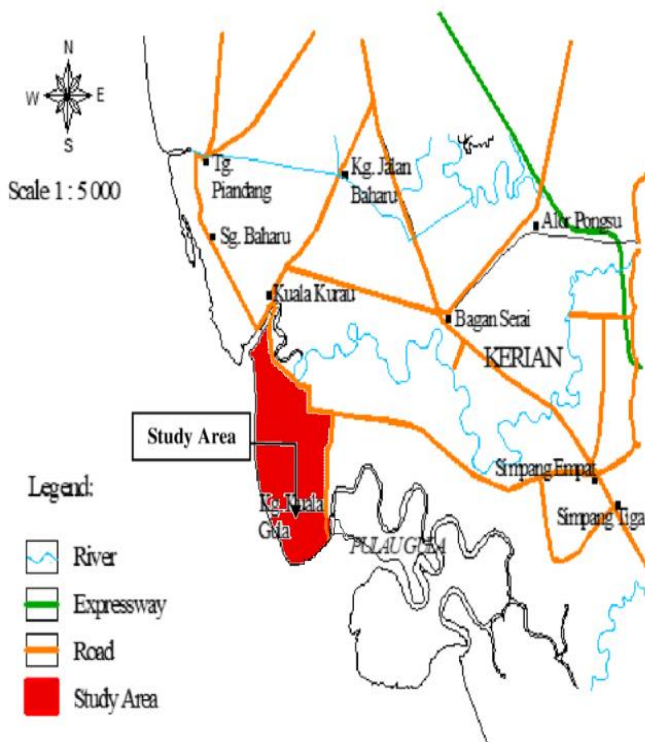
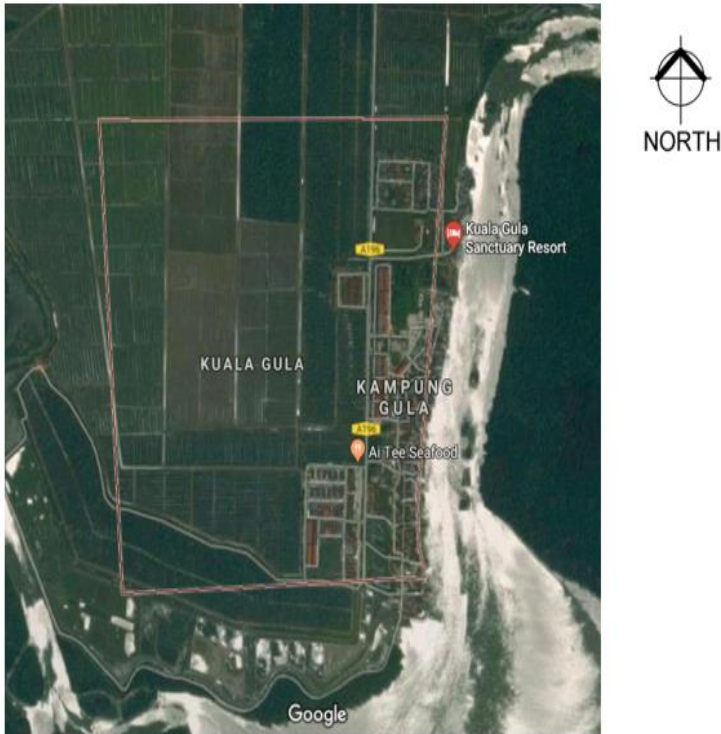
In addition, this study developed four indicators for the sensitivity index, namely: other sources of income, sole household earner, household's ability to cover basic utility demands and economic and quality of life factors. Meanwhile, in term of adaptive capacity, this study were developed five indicators under adaptive capacity index based on probable outcomes resulting from indicators of exposure and sensitivity which were the distance of residence from seashore or river, educational level, monthly household gross income, fixed assets and monthly individual income. In addition, in term of educational level indicator, low literacy and educational levels, weakened institutions, a lack of skill sets, and inadequate infrastructure are all factors that make it difficult to cope with the effects of climate change (UNDP, 2006). Understanding the relationship between gender equity and climate change adaptation and mitigation is crucial for decision-making. This is important since there are no clear or specific methods to address gender-related climate change issues (Brown & H.C., 2011). Additionally, vulnerability indices assist in the identification of vulnerable segments of society and the factors that contribute to their vulnerability, thereby facilitating the formulation of policies pertaining to these groups.

## **METHODOLOGY**

### **Study Area Selection**

The research was conducted in Kuala Gula, in the northern region of the west coast of Peninsular Malaysia. Kuala Gula is situated around 103 kilometres from Ipoh, 45 kilometres from Taiping, and 13 kilometres from Kuala Kurau, Perak and it is one of the fishing communities along the shore is Kuala Gula in Perak's Kerian district. It may be readily accessible from the North South Highway through the Bukit Merah exit (if coming from the north) or North of Taiping or Kamunting (if coming from the south) and it is located at latitude 4° 55' 19" N and longitude 100° 28' 27" E. Malay and Chinese communities make up the majority of the population along the coast, whereas the majority of Indians reside near the palm oil plantations estate in Kula Gula. Besides, approximately 7,000 people make up the population of Kuala Gula. In addition, agricultural plantations comprise 64.7% of the land use in these regions, followed by forests (19.4%), waterbodies (7.61%), and infrastructure and utilities (12.7%) (Kamariah, 2019). Further, palm oil plantation is a massive industry in Kuala Gula, where the

overwhelming majority of the interior land has been converted to support this agricultural endeavor. Fishing is the primary source of income for the local populations of Kuala Gula. Additionally, according to Rahman (2019), there are at least 7,000 acres of operational palm oil facilities in Kuala Gula. Besides, the rise of aquaculture activities has increased the amount of mangroves that have been reclaimed in Kuala Gula (Ismail & Rahman, 2016; Rahman, 2013, 2017). However, higher sea levels and more frequent cyclones have devastated 61% of Perak's 250-kilometer shoreline, including Kuala Gula (GEC, 2020). Apart, according to Global Environment Centre, GEC (2020), climate change makes Kuala Gula vulnerable to coastal erosion, floods, high winds and waves, tsunamis, and increasing sea levels and has affected local communities for nearly a decade.





Sources: Google Maps and Town and Country Planning Department of Peninsular Malaysia (2011)

**FIGURE 1:** The study area- Kuala Gula, Kerian District, Perak

**Data Collections**

The target population of the survey is coastal communities in the study area. Prior to the official survey, the Kuala Gula littoral communities (n=23) participated in face-to-face interviews as a pre-test. Pre-test interviews covered the following topics: (1)-(3) demographics and socioeconomics (4) coastal communities' knowledge and experience with climate change and sea level rise (5) level of knowledge, awareness, and concern of coastal communities regarding climate change and the environment; (6) experiences and perceptions relating to sea level rise (economy); and (7) economic impacts of sea level rise. According to the findings of the pre-test interviews, 65% of the respondents lack a formal education. The average household income of the respondents, which is less than RM 1,849, is low for all of them. Regarding coastal communities' awareness of and familiarity with the risks posed by climate change and sea level rise, 55% of respondents said they were aware of these risks and 52% said they had firsthand experience with them. In addition, in terms of the dimensions of the effect of climate change, 22% of respondents reported experiencing property loss, 65% reported experiencing property damage, and 78% reported assisting communities that had been impacted. Based on comments from the interviewees, we enhanced some incorrect questions and altered the questionnaire's phrases and sections to increase the validity and dependability of this research.

During the actual field visit, exposure (E), sensitivity (S), and adaptive capacity (AC) data were collected. Due to the multicultural nature of Kuala Gula, the distribution of respondents to the questionnaires includes Malay, Chinese, and Indian individuals. 400 household members made up the total number of respondents, with 215 male household members (MHM) and 185 female member households (FHM). As the population of Kuala Gula is approximately 7,000, the sample size was determined using Cochran's method; however, the numbers of male and female member household respondents were selected at random from different occupational categories, as shown in Table 1. Member household respondents were determined based on the filer, spouse, dependents, and all other individuals who typically reside together in the same residence. The ages of household members ranged from 18 to 80 years. We focused on the households' education level when distributing the questionnaires so that they could respond appropriately. For older households who had trouble reading and writing, we held a 30 to 40-minute one-on-one question-and-answer session. Those who could read the questionnaires were then free to respond on their own after we had explained each section. Separately, indications of exposure, sensitivity, and adaptability were evaluated using a well-structured questionnaire (closed-ended questions) and some sections were measured using 5 point of Likert scale. The questionnaire was divided into six sections: (A) household background; (B) information on the distance of housing from coastal area, background of household's assets/buildings and ownership; (C) the level of coastal community knowledge of climate change issues; (D) the level of coastal community awareness of climate change issues; (E) the experiences of the coastal communities on the issues of climate change; and (F) economic factors (access to markets and public facilities, economic activity, training and support from the government).

**TABLE 1.** Distribution of respondents by their occupation

Occupations	Major Livelihood Activities of Respondents	Percentage distribution of respondents by gender (%)	
		MHM	FHM
Fisherfolk	Fishing, Aquaculture	15.35	5.95
Government servants	Teaching and Healthcare	9.30	10.27
Private sectors servants	Palm Oil Estate labors, Estate Supervisors, Machine Technician, Clerks	32.56	24.32
Self Employed	Business owner (Shop and Restaurant) and Drivers(taxi, lorry & bus and e-hailing)	17.67	5.94

<b>Higher institution/College Students</b>	Studying	1.86	3.24
<b>Housewives</b>	Weaving, Daily Wage Labor under Community based Organisation (eg: Sahabat Bakau)	0.0	32.97
<b>Retirees</b>	Pensions	2.32	0.55
<b>Unemployed*</b>	None	20.93	16.76

\*Unemployed: The majority of respondents in the 'unemployed' group were former fishermen from Kuala Gula's earlier generations. Most of them were in their 60s and older.

## Research Method

The IPCC's vulnerability assessment approach served as a framework for the establishment of the Economic Vulnerability Index (EVI). Most of vulnerability and resilience evaluations take into account sensitivity, exposure, and adaptive capabilities to forecast potential effects (Adger, 2001, 2004; Bowen, 2012; Pelling, 2011). In addition, these three dimensions of vulnerability (exposure, sensitivity, and adaptive capacity) were used to frame the EVI tool as its main elements (Sreya et al., 2021). According to K.L. Ebi et al. (2006), exposure is defined as the size of the impacted catastrophes and the resulting losses, sensitivity as the degree to which the system was affected by exposure, and adaptive capacity as the ability of the system to recover from or endure the exposure. Separately, six indicators comprise the exposure component, while three and five indicators comprise the sensitivity and adaptive capacity components, respectively. The major and sub-components indicate for the vulnerability assessment is shown in Table 1. Although each main component has a varied number of sub-components, the EVI employs a balanced weighted average method (Kasturi et al., 2018) where each sub-component contributes equally to the overall score.

This was accomplished using a balance weighted average method, which has been utilized in many vulnerability assessment research (C. Sullivan et al., 2002; M.B. Hahn et al., 2009). The formula for this conversion was modified from the method that was used to calculate the life expectancy index, which is the ratio of the difference between the actual life expectancy and a predetermined minimum, and the range between the predetermined maximum and minimum life expectancy (UNDP, 2022) (also known as the human development index):

$$index_{Sg} = \frac{S_g - S_{min}}{S_{max} - S_{min}} \quad (1)$$

where  $S_g$  is the original subcomponent for gender  $g$  and  $S_{min}$  and  $S_{max}$  are the minimum and maximum values derived for each subcomponent from the male and female household member groups, respectively. Next, using equation (2), the sub-components were averaged after standardization to get the value of each major component:

$$M_g = \frac{\sum_{i=1}^n index_{Sgi}}{n} \quad (2)$$

where  $M_g$  corresponds to one of the three main components of gender,  $g$  [Exposure (E), Sensitivity (S), and Adaptive capacity (AC)] while the subcomponents indexed by  $i$  that make up each major component are represented by  $index_{Sgi}$  while the number of subcomponents in each major component is denoted by  $n$ . After calculating the values for each of the three main components for male and female member households, they were averaged using equation (3) to determine the LVI.

$$EVI_g = \frac{\sum_{i=3}^3 WM_i M_{gi}}{\sum_{i=3}^3 WM_i} \quad (3)$$

that can also be conveyed as:

$$EVI_g = \frac{w_E E_g + w_S S_g + w_{AC} AC_g}{w_E + w_S + w_{AC}}$$

where  $EVI_g$ , the Economic Vulnerability Index for gender,  $g$  equates the weighted average of major components. The weights of each major component,  $W_{Mi}$ , were calculated based on the number of subcomponents it contained. In order to ensure that all subcomponents contributed equally to the aggregate EVI (C. Sullivan & J.R. Meigh, 2002), weights were included. EVI ranges from 0 (least vulnerable) to 0.7 (most vulnerable) (Basiru et al., 2022; Sreya et al., 2021).

## EMPIRICAL FINDINGS

The economic vulnerability index (EVI) of Kuala Gula households was calculated using exposure, sensitivity, and adaptive capacity as subcomponents. Table 3 provides minimum, maximum and sub-components values. There are fifteen sub-components as indicators in the Economic Vulnerability Index (EVI) assessment in total that make up for three major components (Exposure, Sensitivity and Adaptive Capacity) which are level of knowledge about climate change issues, acknowledge climate change is occurring now or within the next several decades, awareness on the causes of climate changes, awareness on the strategies in overcoming climate change, residence impacted by climate change-related issues, personal experiences affected by climate change issues, other sources of income, sole household earner, household's ability to cover basic utility demands, distance to public facilities, access to public facilities, economic and quality of life factors, fixed assets and monthly individual income as presented in the descriptions on main and sub-components of Economic Vulnerability Index (EVI) (Table 2).

**TABLE 2.** The descriptions on main and sub-components of Economic Vulnerability Index (EVI)

Main components	Indicators: Sub-components	Sub-components explanations	Survey question descriptions	References
<b>Exposure</b>	Level of knowledge about climate change issues	Knowledge on climate-related hazards and issues that give multidimensional impact to the environment and livelihood	Select your level of knowledge about the change issue the following climate: Likert scale of 1 (Not at all know) to 5 (Extremely know) 1) Tsunami 2) Global warming affects the earth's ecosystem 3) Sea level rise endangers coastal areas 4) Climate change affects human health 5) Flooding is a concern for low-lying areas 6) Extreme drought events cause a water crisis 7) Strong winds/storms are becoming more frequent 8) Coastal and soil erosion is becoming more frequent 9) Destruction of nature and the built landscape 10) River/sea water quality is deteriorating 11) Climate change affects the degree of intensity and rate rainfall frequency 12) Climate change has affected both terrestrial ecosystems and marine, and is expected to	Developed to fulfill the intended purposes of this research.

		continue to affect many ecosystems, including, mangroves, coral reefs and caves	
Knowledge of climate change is rising now or in the coming several decades.	Did you know that climate change is happening in the present or in the next few decades?	Likert scale of 1 (Not at all know) to 5 (Extremely know) 1) Climate change that has occurred in the past few decades is more serious than before. 2) Climate change is frequently associated with other environmental issues, particularly problems distinct from ozone depletion. 3) Pollution has been occurring and increasing continuously. Climate change is of course caused by the burning of fossil fuels.	Adapted from (IPCC, 2018a)
Awareness on the causes of climate changes	The level of awareness on the causes of climate related changes	Are you aware the following is the causes of climate change? Likert scale of 1 (Not at all aware) to 5 (Extremely aware) 1) Carbon monoxide production has increased 2) Destruction of plants and forests 3) Liquidity of water blocks in Serbia 4) Industry-related waste gas	Adapted from (Buloshi & Ramadan, 2015)
Awareness on the strategies in overcoming climate change	Awareness on the strategies to mitigate climate change	From your awareness, how climate change can be overcome? Likert scale of 1 (Not at all aware) to 5 (Extremely aware) 1) Use of renewable energy sources 2) Minimize the use of natural resources 3) Use resources more efficiently 4) Implement circular economic (recycle, repurpose, return and resell) 5) Numerous trees should be planted. 6) Apply zero waste	Adapted from (Khatibi et al., 2021)
Residence impacted by climate change-related hazards	Previous experience that their residence was vulnerable to hazards related to the climate change	Has your residence ever encountered the incidence of the following climate change effects? Likert scale of 1 (Never) to 5 (Always) 1) Never 2) Sea level rise 3) Flood 4) Drought 5) Erosions 6) Tsunami 7) Sea/river water quality decreases 8) Strong wind/storm 9) Destruction of nature	Adapted from (Sofia & Rawshan, 2022)
Personal experiences affected by climate change issues	Individual experiences that encounter by climate change issues	Are you experiencing the effects of climate change as follows? Likert scale of 1 (Never) to 5 (Always) 1) The effects of climate change cause damage to place/residence/house 2) The effects of climate change cause a loss of place live/residence/house 3) The effects of climate change cause vehicle/property damage things	Adapted from (Collins, 2019; Godovykh & Maksim, 2021; Sainsbury, 2018; Sreya et al., 2021)

		<p>4) The effects of climate change affect physical health (injury, minor or major disability, permanent disability and others)</p> <p>5) The effects of climate change affect mental health (eg: emotions, feelings, mood and others)</p>	
<b>Sensitivity</b>			
Other sources of income	Having alternative sources of income or job in lieu of a primary source of income	Do you have any side income? 1) Yes 2) No	Adapted from (Basiru et al., 2022)
Sole household earner	Sole earner of income for the family	Are you the sole earner for your household? 1) Yes 2) No	Adapted from (Sreya et al., 2021; WorldBank, 1998)
Household's ability to cover basic utility demands	How well the household can fulfill its fundamental utility requirements.	List of utilities that the households fulfill its fundamental utility requirements: 1) Electricity 2) Clean water supply 3) Internet network 4) Cellular phone 5) Wired phone 6) Satellite television	Modified from (PEPFAR, 2017)
Economic and quality of life factors	Aspects of an improved standard of living and economic standing in terms of access to public facilities and government assistance	Likert scale of 1 (Strongly disagree) to 5 (Strongly agree) 1) As a factor in enhancing the quality of my life, the proximity of my home to public facilities (school, clinic, kindergarten) is crucial. 2) Adaptation training from the government or other authorities is crucial to me if climate change impacts occur (for example, solid waste management, energy efficiency management for electrical equipment and others) 3) I require training, assistance, and direction from the government or authorities to increase economic activity and achieve financial stability.	Developed to fulfill the intended purposes of this research.
<b>Adaptive Capacity</b>			
The distance of residence from seashore or river	The distance between their residence and the coast in order to evaluate the security of the household's infrastructure.	What is the distance of your residence from seashore or river? 1) Less than 500 meter 2) 501-1000 meter 3) 1001-1500 meter 4) 1501-2000 meter 5) Above 2000 meter	Developed to fulfill the intended purposes of this research.

Educational level	The highest level of education achieved by household members.	What is your highest educational attainment? 1) No formal education 2) Primary school 2) LCE/SRP/PMR/PT3 3) MCE/SPM 4) Certificate/Diploma/STPM/Foundation/Matriculation 5) Bachelor degree 6) Master degree/PhD	Adapted & modified from (Guo et al., 2021; Salik & Majeed, 2015)
Monthly household gross income	The monthly total income of household members	What is the total monthly income range for the members of your household? 1) Below RM2500 2) RM2501 – RM3170 3) RM3171 – RM3970 4) RM3971 – RM4850 5) RM4851 – RM7100 6) RM7101 – RM10970 7) RM10971 – RM15040 8) Above RM15040	Modified from (Alam & Mallick, 2022; Béné, 2009; Katherine M. Maltby, 2022; Muallil et al., 2011; Sreya et al., 2021).
Fixed assets	Assets value that belongs to households which are purchased for long-term use	How much the price for each asset below? (Vehicles, Furniture & ICT equipment) 1) Below RM1,000 2) RM1,000 – RM3,999 3) RM4,000 – RM6,999 4) RM7,000 – RM9,999 5) Above RM10,000	Developed to fulfill the intended purposes of this research.
Monthly individual income	The monthly individual income of household members	What is your monthly individual income range? 1) Below RM2500 2) RM2501 – RM3170 3) RM3171 – RM3970 4) RM3971 – RM4850 5) RM4851 – RM7100 6) RM7101 – RM10970 7) RM10971 – RM15040 8) Above RM15040	Developed to fulfill the intended purposes of this research

In term of exposure index, the indicators of exposure were expressed in terms of level of knowledge about climate change issues, acknowledge climate change is occurring now or within the next several decades, awareness on the causes of climate changes, awareness on the strategies in overcoming climate change, residence impacted by climate change-related issues, personal experiences affected by climate change issues, Due to the lack of meteorological data in Kuala Gula, the element of climatic fluctuation was not taken into consideration. From Table 4, high exposure indices for MHM and FHM with respective vulnerability scores of 0.528 and 0.518 indicate that they are vulnerable to climate change in Kuala Gula. The level of knowledge about climate change issues and knowledge of climate change is rising now or in the coming several decades slightly higher among FHM with the vulnerability score of 0.660 and 0.600 as compared to MHM (0.655 and 0.597) respectively. Consequently, the exposure indices for MHM and FHM were elevated, with respective vulnerability scores of 0.528 and 0.518 (Table 4). According to the statistical findings, both male and female households in Kuala Gula are vulnerable to climate change in the region. From the vulnerability score, FHM have a slightly deeper knowledge of climate change issues than MHM and nowadays, the knowledge can gain from the various



sources of platform especially social media platform. Social media is now one of the main sources of information on climate change wherein 23% of people use television to acquire their news, compared to 16% of those who use internet news sources. (Andi, 2020). In addition, women are more likely than males to seek out information via social media (Karatsoli & Nathanail, 2020). Additionally, both of male and female households acknowledge that pollution has been occurring and increasing continuously with similar vulnerability score of 0.678 in Table 3.

**TABLE 3.** Minimum, maximum and EVI sub-components' value

Major & sub-components	Descriptions of the subcomponents' constituent parts	Units	Min unit value	Max unit value	MHM	FHM
<b>Exposure</b>						
Level of knowledge about climate change issues	Tsunami	Scale (1-5)	1	5	0.737	0.727
	Global warming affects the earth's ecosystem	Scale (1-5)	1	5	0.581	0.568
	Sea level rise endangers coastal areas	Scale (1-5)	1	5	0.695	0.697
	Climate change affects human health	Scale (1-5)	1	5	0.686	0.709
	Flooding is a concern for low-lying areas	Scale (1-5)	1	5	0.690	0.697
	Extreme drought events cause a water crisis	Scale (1-5)	1	5	0.657	0.673
	Strong winds/storms are becoming more frequent	Scale (1-5)	1	5	0.705	0.734
	Coastal and soil erosion is becoming more frequent	Scale (1-5)	1	5	0.688	0.689
	Destruction of nature and the built landscape	Scale (1-5)	1	5	0.584	0.574
	River/sea water quality is deteriorating	Scale (1-5)	1	5	0.702	0.691
	Climate change affects the degree of intensity and rate rainfall frequency	Scale (1-5)	1	5	0.597	0.612
Knowledge of climate change is rising now or in the coming several decades.	Climate change has affected both terrestrial ecosystems and marine, and is expected to continue to affect many ecosystems, including, mangroves, coral reefs and caves	Scale (1-5)	1	5	0.538	0.554
	Climate change that has occurred in the past few decades is more serious than before.	Scale (1-5)	1	5	0.551	0.549
	Climate change is frequently associated with other environmental issues, particularly problems distinct from ozone depletion.	Scale (1-5)	1	5	0.560	0.574
Awareness on the causes of climate changes	Pollution has been occurring and increasing continuously. Climate change is of course caused by the burning of fossil fuels.	Scale (1-5)	1	5	0.678	0.678
	Carbon monoxide production has increased	Scale (1-5)	1	5	0.622	0.607
	Destruction of plants and forests	Scale (1-5)	1	5	0.702	0.715
	Liquidity of water blocks in Serbia	Scale (1-5)	1	5	0.510	0.527

	Industry-related waste gas	Scale (1-5)	1	5	0.624	0.661
Awareness on the strategies in overcoming climate change	Use of renewable energy sources	Scale (1-5)	1	5	0.584	0.603
	Minimize the use of natural resources	Scale (1-5)	1	5	0.607	0.619
	Use resources more efficiently	Scale (1-5)	1	5	0.614	0.611
	Implement circular economic (recycle, repurpose, return and resell)	Scale (1-5)	1	5	0.643	0.668
	Numerous trees should be planted.	Scale (1-5)	1	5	0.659	0.692
	Apply zero waste	Scale (1-5)	1	5	0.584	0.580
Residence impacted by climate change-related hazards	Never	Scale (1-5)	1	5	0.203	0.197
	Sea level rise	Scale (1-5)	1	5	0.523	0.497
	Flood	Scale (1-5)	1	5	0.563	0.403
	Drought	Scale (1-5)	1	5	0.373	0.359
	Erosions	Scale (1-5)	1	5	0.321	0.341
	Tsunami	Scale (1-5)	1	5	0.257	0.186
	Sea/river water quality decreases	Scale (1-5)	1	5	0.313	0.324
	Strong wind/storm	Scale (1-5)	1	5	0.533	0.424
Personal experiences affected by climate change issues	Destruction of nature	Scale (1-5)	1	5	0.327	0.345
	The effects of climate change cause damage to place/residence/house	Scale (1-5)	1	5	0.389	0.277
	The effects of climate change cause a loss of place live/residence/house	Scale (1-5)	1	5	0.260	0.203
	The effects of climate change cause damage to vehicles	Scale (1-5)	1	5	0.313	0.239
	The effects of climate change affect physical health (injury, minor or major disability, permanent disability and etc)	Scale (1-5)	1	5	0.157	0.176
	The effects of climate change affect mental health (eg: emotions, feelings, mood and others)	Scale (1-5)	1	5	0.250	0.227
<b>Sensitivity</b>						
Other sources of income	Do you have any side income?	Range(1-2)	1	2	0.921	0.795
Sole household earner	Are you the sole earner for your household?	Range(1-2)	1	2	0.405	0.211
Household's ability to cover basic utility demands	Electricity-1	Range(1-2)	1	2	0.014	0.005
	Clean water supply-2	Range(1-2)	1	2	0.047	0.049
	Internet network-3	Range(1-2)	1	2	0.460	0.519
	Cellular phone-4	Range(1-2)	1	2	0.442	0.503
	Wired phone-5	Range(1-2)	1	2	0.940	0.876
	Satellite television-6	Range(1-2)	1	2	0.619	0.600
Economic and quality of life factors	As a factor in enhancing the quality of my life, the proximity of my home to public facilities (school, clinic, kindergarten) is crucial	Scale (1-5)	1	5	0.750	0.760
	Adaptation training from the government or other authorities is	Scale (1-5)	1	5	0.749	0.670



	crucial to me if climate change impacts occur (for example, solid waste management, energy efficiency management for electrical equipment and others)					
	I require training, assistance, and direction from the government or authorities to increase economic activity and achieve financial stability	Scale (1-5)	1	5	0.629	0.739
<b>Adaptive Capacity</b>						
The distance of residence from seashore or river	Less than 500 to 2000 meter and above	Range(1-5)	1	5	0.290	0.328
Educational level	Level of education of the household members	Range(1-7)	1	5	0.407	0.422
Gross monthly household income	What is the total monthly income range for the members of your household?	Scale (1-5)	1	5	0.124	0.129
Fixed assets	Asset price for vehicles	Range(1-5)	1	5	0.312	0.281
	Asset price for home furniture	Range(1-5)	1	5	0.417	0.409
	Asset price for ICT equipment	Range(1-5)	1	5	0.366	0.347
Monthly individual income	What is your monthly individual income range?	Range(1-8)	1	8	0.122	0.081

Apart, in term of the awareness among the household members, FHM exposed with the higher level of awareness on the causes of climate changes and awareness on the strategies in overcoming climate change with the vulnerability score of 0.627 and 0.629 than MHM with the vulnerability score of 0.615 and 0.610 respectively (Table 4). Given that women are more likely than males to believe that climate change is detrimental. These MHM and FHM sub-components' vulnerability scores are not significantly different from one another. Thus men and women agree that global warming is occurring and is caused by humans, but women consistently perceive a greater risk that global warming will affect them personally (Matthew Ballew et al., 2018). Meanwhile, both male and female were aware that the destruction of plants and forests as one of the major causes of climate change and followed by industry-related waste gas. Further, as the strategies in overcoming climate change, both male and female household members were aware that there should be extensive tree planting in order to mitigate the climate change related issues with the vulnerability score of 0.659 and 0.692 respectively (Table 3). There were moderate vulnerability score for previous experiences faced by both male and female household members wherein the vulnerability score for residence impacted by climate change-related hazards of MHM and FHM were 0.379 and 0.342 respectively while the vulnerability score of personal experiences affected by climate change issues for MHM and FHM were 0.274 and 0.254 respectively (Table 4). Flood, severe wind/storm, and sea level rise were the most prevalent climate-related hazards experienced by households, with respective vulnerability scores of 0.563, 0.533, and 0.523 for MHH and 0.424, 0.403, and 0.497 for FHH (Table 3). Apart from the nine components taken into account under this sub-component, MHM were most exposed to the effects of climate-related hazards from their previous experiences (Table 3) since fisher folk were their primary line of work. As similar found by Sreya et al. (2021), many male heads reported being caught in cyclones while fishing at sea, male-headed households were subjected to a greater number of extreme weather events. This was due to the fact that the majority of the male households engaged in fishing. Despite a worldwide sea level rise estimate of 1.7 to 3.1 millimeters per year, Malaysia's regional sea level rise is anticipated to be greater due to the country's topography and climate. Low-lying locations with a large population and a high

level of socioeconomic activity are vulnerable to flooding (Nor Aslinda & Radzi, 2013). Meanwhile, moderate vulnerability score on the sub-components of personal experiences affected by climate change issues with the statistical score of 0.274 and 0.254 for MHM and FHM respectively (Table 3).

Further, from Table 3 on the subcomponents' constituent parts of personal experiences affected by climate change issues, the effects of climate change cause damage to place/residence/house give highest score as compared to other constituent parts under this sub-component for both households member with the vulnerability score of 0.389 and 0.277 respectively. Besides, the consequences of the climate change damage the vehicle of the household members with the vulnerability score of 0.310 and 0.239 for MHM and FHM respectively. Male household members suffered more losses from climate-related difficulties than female household members from the elements under this sub-component. The findings also supported by Sreya et al. (2021) as male households experienced more losses as a result of climate-related catastrophes than female households. The losses from floods and cyclones will increase further L.M. Bouwer (2013b), as sea level and severe weather occurrences are expected to rise in the future (B. H. S. S.A. Kulp, 2019). In addition, the results demonstrated that MHH were marginally more vulnerable to the negative effects of climate change on mental health (e.g., emotions, feelings, and mood) than FHH, with vulnerability scores of 0.250 and 0.227, respectively. The effects of climate change on mental health and emotional wellness are profound and complex (Emma Lawrance et al., 2021). Further, from the statistical results, there is a direct link between experiencing climate change's consequences, such as higher temperatures or more frequent and severe extreme weather events, and declining mental health, even leading to an increase in suicides (Cruz J et al., 2020; Perceval M et al., 2019; Rataj E et al., 2016). The likelihood of developing post-traumatic stress disorder (PTSD), depression or poor mood, and intense discomfort increases when one personally experiences the impacts of climate change, such as during a flooding disaster (Emma Lawrance et al., 2021). The effects of climate change, such as high temperatures, which harm both physical and mental health, are more likely to affect those who fit the criteria for mental illness.

The provision of mental healthcare runs the danger of being disrupted due to damage to infrastructure and supply chains caused by climate change effects (Emma Lawrance et al., 2021). After or even before a severe climate change event, effects on mental health may take place (Cianconi et al., 2020). The effects of climate change on mental health might vary from mild stress and discomfort to clinical illnesses, such as anxiety and sleep difficulties (Blanc J et al., 2019) to post-traumatic stress disorder, depressive disorders, and suicidal ideation (Ursano RJ et al., 2017; WHO, 2013). Other effects might include how people and communities see and experience their daily lives, as well as how they must adapt to and grasp the ramifications of climate change (WHO, 2013). However, the effects of climate change affect physical health were higher for FHM with the vulnerability score of 0.176 than MHM (0.157) (Table 3). Additionally, climate change impacts like droughts might have a greater impact (Humphrey V et al., 2018), particularly in rural regions (OBrien LV et al., 2014) including famine and forced migration (Abel GJ et al., 2019), the ensuing congestion of coastal and delta areas could also result in physical injury (Cianconi et al., 2020). Ecosystems with less biodiversity may be at danger from climate change, which might also affect fishing and hunting practices (IPCC, 2018b).

**TABLE 4.** Sub-components, Exposure, Sensitivity, Adaptive Capacity and Economic Vulnerability Indices for MHM and FHM

Main components	Sub-components	Index Values	
		MHM	FHM
<b>Exposure</b>		<b>0.528</b>	<b>0.518</b>
	Level of knowledge about climate change issues	0.655	0.660
	Knowledge of climate change is rising now or in the coming several decades.	0.597	0.600
	Awareness on the causes of climate changes	0.615	0.627

Awareness on the strategies in overcoming climate change	0.610	0.629
Residence impacted by climate change-related hazards	0.379	0.342
Personal experiences affected by climate change issues	0.274	0.254
<b>Sensitivity</b>	<b>0.560</b>	<b>0.573</b>
Other sources of income	0.921	0.795
Sole household earner	0.595	0.789
Household's ability to cover basic utility demands	0.420	0.425
Economic and quality of life factors	0.710	0.723
<b>Adaptive Capacity</b>	<b>0.305</b>	<b>0.285</b>
The distance of residence from seashore or river	0.290	0.328
Educational level	0.407	0.422
Gross monthly household income	0.124	0.129
Fixed assets	0.365	0.346
Monthly individual income	0.122	0.081
<b>Overall Economic Vulnerability Index, EVI</b>	<b>0.125</b>	<b>0.134</b>

$$EVI_{\text{Male}} = LVI - IPCC_{\text{Male}} = (E_{\text{MHM}} - AC_{\text{MHM}}) * S_{\text{MHM}} = (0.528 - 0.305) * 0.560 = 0.125$$

$$EVI_{\text{Female}} = LVI - IPCC_{\text{Female}} = (E_{\text{FHM}} - AC_{\text{FHM}}) * S_{\text{FHM}} = (0.518 - 0.285) * 0.573 = 0.134$$

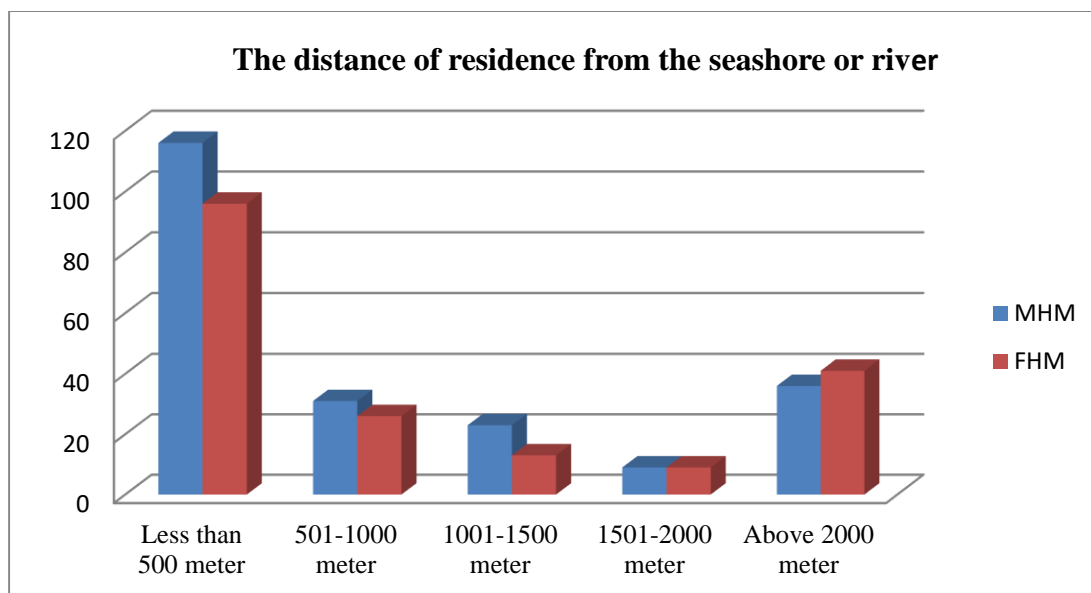
Next, the second major component is sensitivity. It is defined as the extent to which a household's economic features may make it susceptible to the effects of climate changes. The sensitivity indices for MHM and FHM were deemed to be extremely sensitive and more vulnerable in term of economically. FHM indicates a greater sensitivity index with a score of 0.573 than MHM (0.560) (Table 4). This was determined by calculating the households' incomes and economic standing. In this context, sensitivity is described as the extent to which households may be influenced by climate changes due to their economic features. This was determined by assessing the household's income and economic position. A greater sensitivity index indicates that an intervention should be considered. The vulnerability score of the sensitivity's sub-components showed that other source income indicate highest score for both household members, MHM and FHM with the vulnerability score of 0.921 and 0.795 respectively. Consequently, the exposure indices for MHM and FHM were elevated, with respective vulnerability scores of 0.528 and 0.518 (Table 3). According to the statistical findings, both male and female households in Kuala Gula are vulnerable to climate change in the region. This sub-component index showed the most sensitive among the household, indicates that the majority of households does not have alternative sources of income and rely solely on their primary source of income. The majority of male household members are fishermen, while the majority of female household members are housewives, with some of them employed in the private sector as the second greatest occupation category contribution. (Table 1). Households have no other source of income besides fishing, which could increase their vulnerability in the event of extreme climate events (Sreya et al., 2021). Since fishing carries a high level of risk, they also need to have at least one other supplementary job to secure the financial stability of themselves and their family (Zaimah R, et al., 2012).

As remarked by T. Panayotou (1980), the commercialization of the fisheries sector necessitates the promotion of occupational diversity outside of the fisheries sector in order to ensure a more secure standard of living. Meanwhile, from Table 4, the vulnerability score of the sub-component of sole household earner for MHM and FHM were 0.595 and 0.789 respectively. Moreover, 87 of male household members were sole earner while another 128 male household were not sole earner meanwhile 39 of female household members were sole earner and the rest of them, 146 were not sole earner. Since

this study focusing on the household members of Kuala Gula, there is household respondents were headed-households and there were that their household members are also earner or working for their family. MHM and FHM had a vulnerability score of 0.420 and 0.425, respectively, for their ability to meet basic utility requirements. In this subcomponent, FHM scored significantly higher than MHM. FHM were highly The vulnerability score of electricity, clean water supply, internet network, cellular phone, wired phone and satellite television for MHM were 0.014, 0.047, 0.460, 0.442, 0.940 and 0.619 while for FHM were 0.005, 0.049, 0.519, 0.503, 0.876, 0.600 respectively (Table 3). The majority of MHM and FHM were more aware of the need for an internet network, mobile phone, wired phone, and satellite television. However, households no longer use wired telephones because they have been replaced by mobile phones. For the youthful and middle-aged members of the household, a reliable internet connection is a necessity, as the internet has become an essential tool for work, education, and other purposes. As found by Sreya et al. (2021), the small-scale coastal households, regardless of their headship, labored to meet their daily needs.

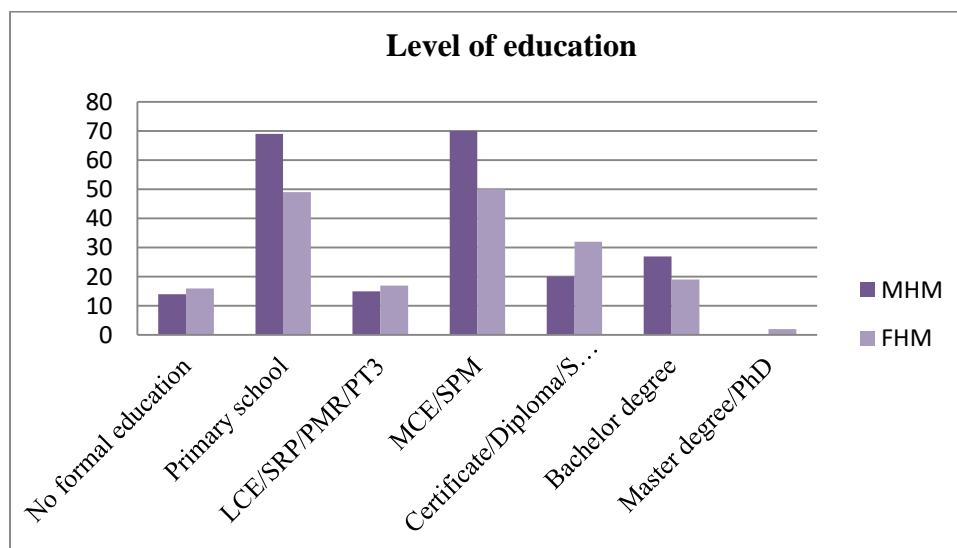
Besides, the vulnerability scores for economic and quality of life factors for MHM and FHM were 0.71 and 0.723, respectively (Table 4). Both of households were sensitive in enhance their economic standing for their family. From Table 3, the statistical finding on the sub-component indicate that as a factor in enhancing the quality life of households, the proximity of their home to public facilities is crucial with the vulnerability score of 0.750 and 0.760, adaptation training from the government or other authorities is crucial to them if climate change impacts occur (for example, solid waste management, energy efficiency management for electrical equipment and others) with the score of 0.749 and 0.670 respectively. In addition, the households sensitive on and required training, assistance, and direction from the government or authorities to increase economic activity and achieve financial stability with the corresponding score of 0.629 and 0.739. Fishermen always strive to improve their skills, thus they must be delighted with the amount of wealth they experience as a result of their profession and income (Ghani et al., 2017). Apart, government assistance does improve fishermen's quality of life, as observed by (Ghani et al., 2017). Additionally, Dara Aisyah and S. (2014), found that the fishermen's income increased significantly after receiving assistance and funding from the government, provide more credence to this. The revenue of fisherman has changed significantly since then as well. But in order to prevent inconsistencies in the funding of aid and subsidies among them, the government must also reassess and keep track of the adequacy of the support given to the nearby fishing community.

Meanwhile, the adaptive capability score of the household is expressed in terms of its vulnerability. From Table 4, the adaptive capacity index among MHM and FHM were low with the score of 0.305 and 0.285 respectively. The adaptation ability of coastal communities is often lower than that of the overall population (I. Rudiarto & D. Pamungkas, 2020). The scores for the household's adaptive ability are provided by the following subcomponents. The vulnerability score for the distance of residence from seashore or river for MHM and FHM were 0.290 and 0.328 respectively. Most of them live close to seashore or river (Figure 2).



**FIGURE 2:** The distance of MHM and FHM’s residence from the seashore or river

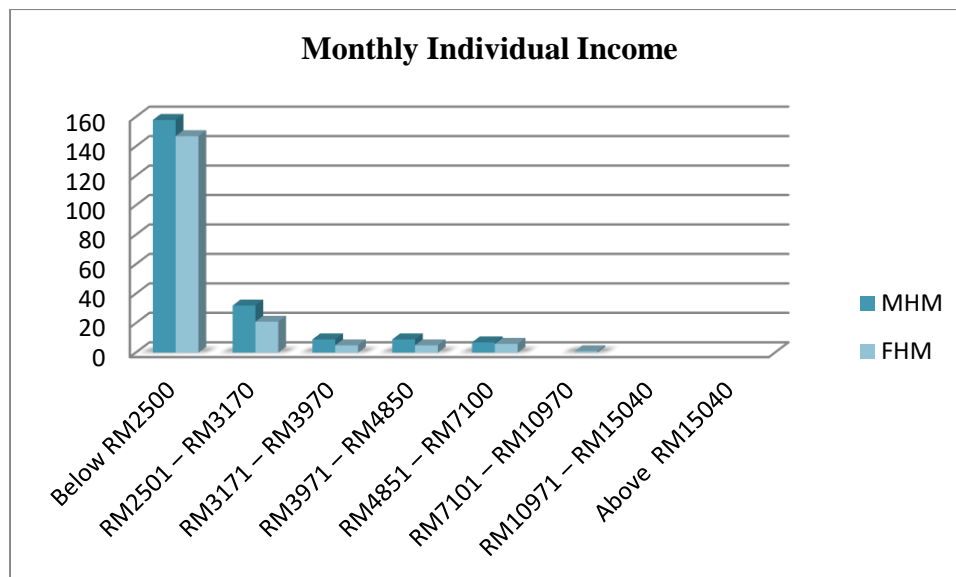
From figure 2, 116 of MMH and 96 of FHM were live near to the seashore or river with the distance less than 500 meter. Likewise, 269 male and female household members lived within one kilometer of a coastline or river. Hence, without proper retaining concrete wall, these communities will be in danger once the climate related hazards occur such as flooding and sea level rise. The socio-economic well-being of coastal communities and states may be compromised as a result of climate-related hazards like sea level rise, which can reduce the size of an island or state and its infrastructure, including airports, roads, and capital cities, which typically predominate in coastal areas. These hazards may also exacerbate inundation, erosion, and other coastal hazards and pose a threat to essential infrastructure, neighborhoods, and facilities (Handmer et al., 2012). Apart, for MHM and FHM, the moderate respective vulnerability score for the educational level were 0.407 and 0.422.



**FIGURE 3:** The level of education of MHM and FHM in Kuala Gula.

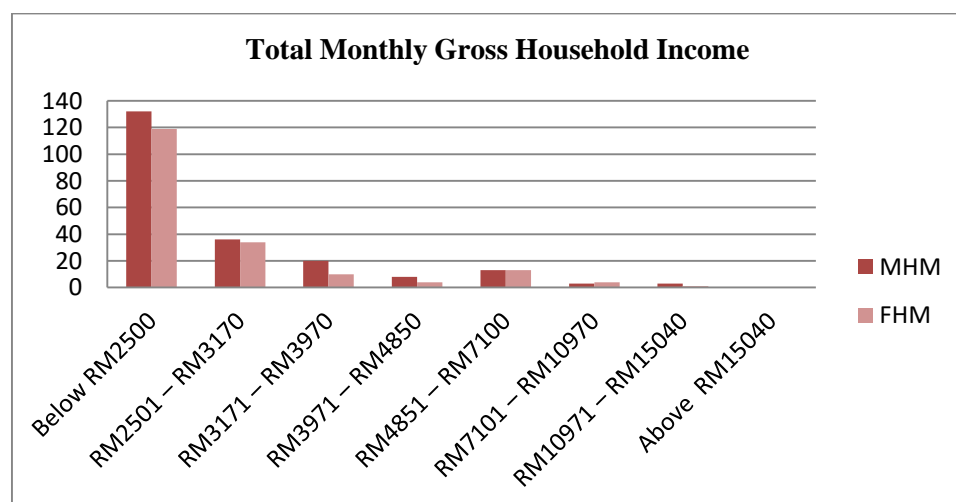
The majority of MHM and FHM were taught through the high school level. Besides, 70 of MHM and 50 of FHM had completed secondary school, whereas 69 and 49 of MHM and FHM only attended primary school and 14 and 16 of MHM and FHM lacked formal education. In addition, as shown in Figure 3, the majority of households with tertiary education are government and private

servants. The ability of communities to adapt to risks and vulnerabilities associated with climate change is considerably enhanced through education (Wamsler et al., 2012), both before and after disasters (Striessnig et al., 2013)



**FIGURE 4:** Monthly individual income of MHM and FHM

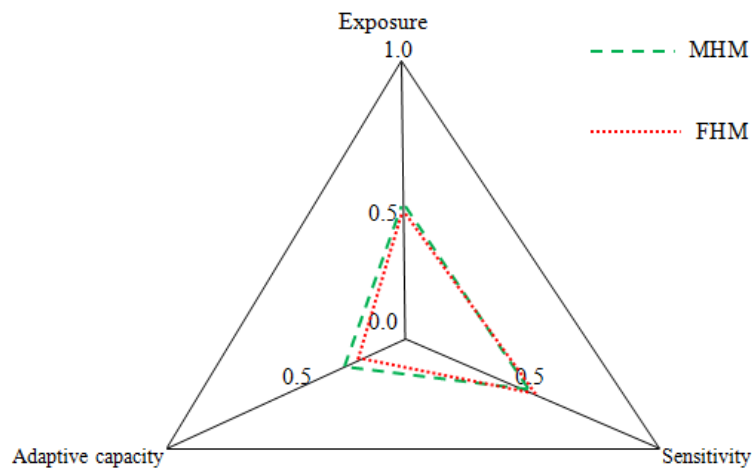
Besides, lower gross monthly household income and monthly individual income for both household with the vulnerability score's MHM of 0.124 and 0.122 and for FHM, 0.120 and 0.081 respectively. Besides, FHM had a lower vulnerability score based on individual income than MHM. Additionally, from Figure 4, 158 of MHM and 147 of FHM were earned below than RM2500 per month. It indicates that the coastal households live below the poverty threshold. Hence, expansion of the household income-generating strategies remains a viable option for both household categories.



**FIGURE 5:** Total monthly gross household income of Kuala Gula

Moreover, from Figure 5, majority of the households stated that the total monthly gross household income of Kuala Gula below than RM2500 with 132 and 119 household members for MHM and FHM respectively. This result of total household income considered as lowest income range or considered as bottom 40% of the Malaysian household income (B40). In addition, the vulnerability score and the chart in Figures 4 and 5 showed that the monthly income of the male and female family members of Kuala Gula was lower. Besides, MMH and FHM have vulnerability scores for fixed assets

of 0.365 and 0.346, respectively. The vulnerability score of total assets of vehicles, furniture and ICT equipment were 0.312, 0.417 and 0.366 for MHM and 0.281, 0.409 and 0.347 for FHM respectively. Consequently, the adaptive capacity index among MHM and FHM were low with the score of 0.305 and 0.285 respectively (Table 3). They still lack in the type of vehicle assets and majority of them only had motorcycle and for the fisher folks they had *sampan* or boat. Consequently, based on the statistical results of each indicator of adaptive capacity, the adaptive measure for female household members in Kuala Gula should be strengthened.



**FIGURE 6:** Male household members (MHM) and female household members (FHM) vulnerability triangle diagram of the major component of the Economic Vulnerability Index

In overall, from the research we found that, in terms of sensitivity and adaptive capacity, female household members were found to be more vulnerable than male household members, while their exposure was marginally less i.e., exposure (MHM-0.528;FHM-0.518), sensitivity (MHM-0.560;FHM-0.573) and adaptive capacity (MHM-0.305;FHM-0.285). Figure 6 indicate the vulnerability diagram of the three major aspects of the Economic Vulnerability Index for MHM and FHM in Kuala Gula. However according to Sreya et al. (2021), in terms of exposure, female-headed households emerged as more vulnerable. Conversely, our statistical result found that male household members were highly exposed to climate change. Although, Sreya et al. (2021) found that the exposure were highly among female headed, however they found that while fishing at sea, numerous male heads reported being impacted by storms. Female-headed households were not affected by these occurrences because a few of the female headed households surveyed actively engaged in fishing. MHM were more vulnerable than FHM based on the subcomponent of previous experiences within the exposure index. MHM had a higher vulnerability score for this subcomponent (previous experiences). Consequently, the households were more exposed as a result of their extensive prior exposure to climate-related issues. According to (K. Van Aelst & N. Holvoet, 2016), social practices increased women's vulnerability to climate change by heightening their exposure. The most exposed area may not necessarily be the most sensitive or have the least ability to cope, even if both home groups belonged to the same geographic location (G.A. Gbetibouo et al., 2010; M. Islam et al., 2014). This is because the influence of climate change would be perceived unevenly across the households. Between MHM and FHM, there were slightly discrepancies in the vulnerability score for adaptive capability. L. Phan et al. (2019), concurred that males had a higher potential to adjust to the effects of climate change. According to S. Bhadra (2017), women's vulnerability to climate change is related to their typical lower socioeconomic level. Based on the EVI's assessment of MHM and FHM's economic vulnerability to climate-related problems, FHM was found to be more vulnerable (0.134) than MHM (0.125) (Figure 6). Due to their limited ability to adapt, low fixed asset value, low monthly income, increased vulnerability to economic instability, and inability to meet their basic utility needs, FHM are economically exposed to climate change challenges. This result was parallel to the study conducted by (Basiru et al. (2022); K. Balikoowa et al., 2019) that female were more vulnerable to the climate change.



## CONCLUSION

According to the study's findings, economically disadvantaged coastal households suffered severe losses due to climate change. Climate changes were found to have a significant effect on both MHM and FHM community. This result highlights the impact of gender on the economic vulnerability of household members. This study revealed a disparity between male and female household members' sensitivity to climate change in the Kuala Gula coastal area. In addition, the results demonstrated that female household members are more vulnerable to climate change and have a lower adaptive capacity. As a whole, female household members were significantly more exposed to climate change than male household members with a higher EVI. This study demonstrated conclusively that economic vulnerability on the gender dimension can be analyzed using exposure, sensitivity, and adaptive capacity within the framework for sustainable vulnerability. This study develops specific indicators for each main vulnerability component. The exposure index made up by several indicators which are level of knowledge and awareness in regards to climate related issues and the experiences of the coastal households towards the climate related hazards. Meanwhile, sensitivity index comprised of multiple indicators, namely sources of income, sole household earner, household's ability to cover basic utility demands and economic and quality of life factors while adaptive capacity were made up by indicators of the distance of residence from seashore or river, educational level, gross monthly household income, fixed assets and monthly individual income.

According to the statistical findings, exposure to climate change-related concerns has an impact on coastal households' increased knowledge and awareness. From the statistical result of exposure index, the exposure of male and female were only slightly different. In this research, female household members had greater levels of knowledge and awareness about climate change than did male household members. Apart, better of knowledge and awareness level influence in greater of exposure towards the climate change issues. In the meantime, the educational level of the FHM was higher than MHM in Kuala Gula. Hence, we can conclude that FHM had better knowledge than MHM in regards to climate change. However, male household members scored higher on experiences' exposure. Higher prior experiences towards climate related issues caused the household more vulnerable and exposed to climate change.

In terms of the sensitivity index, female household members contribute to a higher sensitivity index, as they are more sensitive to climate change's effects. Apart, most of the households were did not have alternative source of income. Every coastal household family must comply with a policy intervention that makes it essential for them to have at least one other source of income so they can make ends meet during the off-season (C.A. Paulus et al., 2019). This would guarantee that the family would experience less stress during a catastrophe connected to climate change. Aside from economic and quality of life factors as a subcomponent under sensitivity, female household members really require training, assistance, and direction from the government or authorities in order to improve their economic status and attain financial stability.

In addition, lower adaptive capacity index for female household members indicate that they are more vulnerable to the impact of climate change. The monthly income of FHM was lower than MHM. The majority of female household members are housewives who do not engage in income-generating activities. They only rely on their husband that relatively earned with lowest income range or considered as bottom 40% of the Malaysian household income (B40) wherein they earn less than RM4, 850 per month. In addition, the proximity of their residency to the coastline or river necessitates the promotion of preventative measures, such as the construction of a retaining wall, to prevent and mitigate the effects of climate-related hazards such as sea level rise and flooding. The majority of youthful members of the household have only completed secondary education. Therefore, the intervention must be considered by the government in order to ensure that the community in Kuala Gula can increase its educational level, particularly among the younger generations, so that it can improve their economic standing.

Providing a facility to educate job-related skills to the coastal population may enable them to pursue other livelihood alternatives outside of the fishing industry during lean seasons or the creation of new programs that are solely for female household members, with free beginning money provided to establish new businesses. Women ought to be brought to the forefront of different sectors, earning a higher income, and becoming an integral part of the economic, social, and cultural life of coastal communities (J. Kurien, 2002). We conclude that the perspective of gender may be the optimal method



for assessing disparities in vulnerability to the effects of climate change. The unintended consequence of ignoring gender course in sustainability debates can damage or misinform the path of adaptation strategy as a result of allocating resources based on the incorrect presumption of vulnerability outcomes. The study also found that decreasing vulnerability among vulnerable female households necessitates a proactive adaptation that addresses indicators of exposure, sensitivity, and adaptability. In addition, the findings of this study can assist in comprehending the factors that contribute to vulnerability and enhancing gender resilience in terms of financial stability and economic diversification options within coastal communities. This will facilitate the identification of the most vulnerable populations in programs for climate change adaptation.

As climate-related risks are expected to increase in the future, immediate attention should be paid to policies that assure secure livelihoods for both men and women in coastal communities. Programs to enhance the adaptive capacity of coastal households, with a particular focus on female household members, should also be developed. Local government action, both monetary and policy intervention, is required to implement a new system. Gender-based duties and obligations should be eliminated via gender-inclusive education and awareness programs. The climatic catastrophe-related viewpoint of "act after disaster, not before disaster" must gradually but steadily evolve in order to elevate coastal households out of poverty and improve the economic well-being exacerbated by the effects of climate change. Gender vulnerability assessments in climate adaptation programmers that can be integrated into ongoing national efforts to develop localized action plans, like the National Adaptation Plan for Combating Climate Change, could be a pathway as an alternative entry points for better understanding and action of implementing the Sustainable Development Goals (SDGs), particularly on the poverty, education, gender equality, economic growth, and climate action for coastal households in Malaysia.

The research illustrates the adaptability and suitability of computing EVI in order to examine economic vulnerability assessment to climate change from a gender viewpoint. The study's conclusions, however, are restricted to the vulnerabilities that were present at the time of the research and are primarily relevant to the study's emphasis; the aspects of climatic variability were not included in this study. Future research may enhance the EVI for a broader emphasis aspects and proper applicability in practical situations. This study focuses on the male and female household members however, gender headed- households are not explored in this research. Lastly, this study focused on the quantitative close ended surveyed, hence utilizing both quantitative and qualitative methodologies in future studies may be thought of as the ideal way.

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## **AUTHOR CONTRIBUTIONS**

Conceptualization, M.M.K., F.F.S., K.N.A.M., A.J., and N.M.; Data curation, F.F.S., M.M.K., A.J. and N.M.; Formal analysis, F.F.S. and M.M.K.; Methodology, F.F.S., M.M.K. and K.N.A.M.; Software, F.F.S., and M.M.K.; Supervision, F.F.S., K.N.A.M., A.J., and N.M.; Writing—original draft, M.M.K., F.F.S., K.N.A.M., A.J. and N.M.; Writing—review & editing, M.M.K., F.F.S., A.J., and N.M. All authors have read and agreed to the published version of the manuscript.

## **CONFLICTS OF INTEREST**

The authors declare no conflict of interest or close personal connections that may have looked to have influenced the work disclosed in this publication.

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## FINANCIAL INCLUSION AND INCOME INEQUALITY: A THRESHOLD ANALYSIS

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### **ABSTRACT**

*Financial inclusion plays a crucial role in addressing income inequality by promoting economic empowerment and reducing disparities among individuals and communities. This study intends to investigate the effect of financial inclusion on income inequality in selected 55 developed and developing countries in 2014, 2017, and 2020. For this purpose, a new financial inclusion index is constructed where it is more reliable than the previous index which some information on financial inclusion that has been ignored by past researchers such as financial technology and barriers has been included. The role of financial inclusion on income inequality is estimated using a cross-sectional threshold method. The results demonstrate that there is a threshold effect in the financial inclusiveness and income inequality relationship. We found that the impact of financial inclusion on income inequality is positive and significant only after a certain threshold level of the financial inclusion index has been attained. The findings suggest further boosting access and utilization of financial inclusion in maximizing the well-being of the population is potent in reducing income inequality and delivering long-run economic development.*

**Keywords:** Financial inclusion, income inequality, threshold estimation

**JEL :** O3,O33,C31,C18,C50

### **ABSTRAK**

*Keterangkuman kewangan memainkan peranan penting dalam menangani ketidaksamaan agihan pendapatan dengan menggalakkan pemerkasaan ekonomi dan mengurangkan jurang perbezaan dalam kalangan individu dan masyarakat. Kajian ini berhasrat untuk mengkaji kesan keterangkuman kewangan terhadap ketidaksamaan agihan pendapatan di 55 negara yang terpilih pada tahun 2014, 2017 dan 2020. Bagi tujuan kajian ini, indeks keterangkuman kewangan baharu dibina di mana indeks ini lebih baik daripada indeks sebelumnya dimana ia mengambil kira beberapa maklumat tentang sistem kewangan yang telah diabaikan oleh para penyelidik yang lalu seperti teknologi kewangan yang dapat memudahkan lagi perkhidmatan kewangan dan halangan-halangan yang menyebabkan populasi terkeluar daripada sistem kewangan. Peranan rangkuman kewangan terhadap ketidaksamaan pendapatan dikaji dengan menggunakan kaedah ambang keratan rentas. Keputusan menunjukkan bahawa terdapat kesan ambang dalam keterangkuman kewangan dan hubungan ketidaksamaan pendapatan. Kami mendapati bahawa kesan rangkuman kewangan terhadap ketidaksamaan*

*pendapatan adalah positif dan ketara hanya selepas tahap ambang tertentu indeks rangkuman kewangan telah dicapai. Penemuan mencadangkan peningkatan dalam akses dan penggunaan rangkuman kewangan untuk memaksimumkan kesejahteraan penduduk adalah berkesan dalam mengurangkan ketidaksamaan pendapatan dan meningkatkan pembangunan ekonomi jangka panjang.*

**Katakunci:** *Keterangkuman kewangan, ketidakseimbangan agihan pendapatan, kesan ambang*  
**JEL:** *O3,O33,C31,C18,C50*

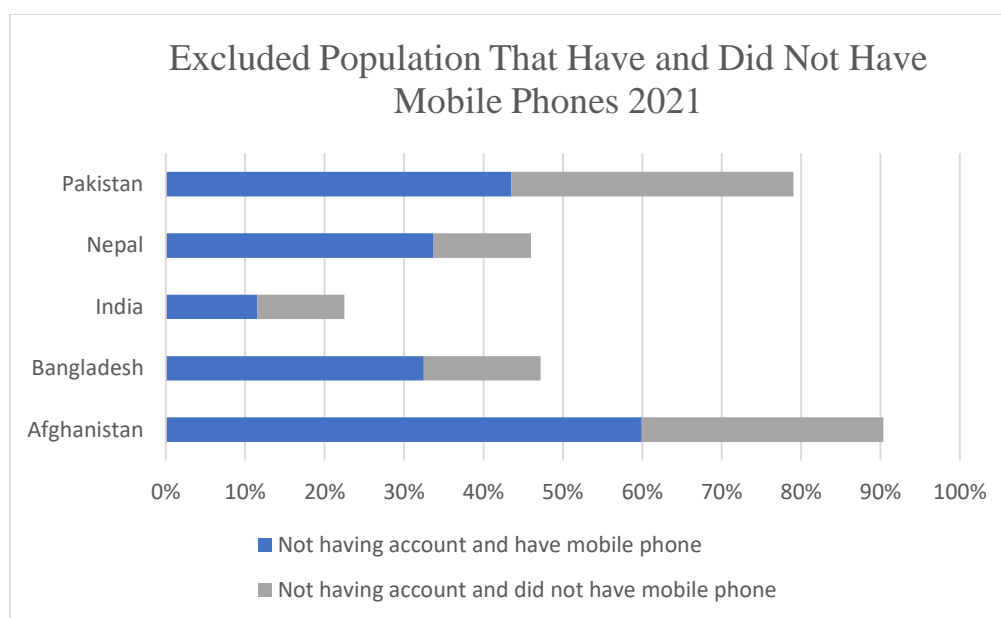
## INTRODUCTION

Income inequality has become a persistent global issue and is recognized as a significant challenge by the United Nation's Sustainable Development Goals (SDGs). Income inequality refers to the unbalanced distribution of income and wealth among individuals or groups within society. Statista (2022) has reported that the most population that lives below the poverty line is in Africa. Income inequality could be caused by various factors such as economic factors including differences in labor market conditions, technological advancements, globalization, and the concentration of wealth. Social factors like education, skills, gender disparities, and social mobility can also contribute to income inequality. According to Omar and Inaba (2020), the prevailing nature causes the slowing of poverty reduction particularly in developing countries. The lack of asymmetric information, transaction cost, and other market imperfections has challenged policymakers in extending the socioeconomic benefits, particularly in rapid economic growth, and has contributed to the imperfect allocation of these capital resources causing some participants in the economy may be excluded from the financial services and market, thus hindering their progress in economic advancement (Demir et al., 2020). Thus, addressing income inequality is important to promote inclusive growth, social protection, and equal opportunities for all populations and it requires a comprehensive approach that combines economic policies, social interventions, and political actions.

Financial inclusion has been recognized as a key element in combating poverty and income inequality in the country. Over the years, there has been significant improvement in the development of the financial sector, resulting in increased attention from numerous researchers toward the relationship between financial inclusion and economic growth (Nizam et. al., 2020) as well as income inequality (Park and Mercado, 2015; Segning et. al. 2023). Theoretically, a well-developed inclusive financial system provides a wide range of services that can be accessed easily by all population segments and provide new business opportunities that can benefit the economy. Financial inclusion refers to all initiatives to make formal financial services accessible and affordable to all economic participants, particularly low-income groups. Financial inclusion has recently been perceived as a dynamic tool in sustainable and inclusive economic growth and increasing job creation, leading to reduced poverty and income inequality. Financial inclusion enables the participant in the economy to become more capable of making longer-term consumption and investment decisions and dealing with unexpected short-term shocks. It's important to note that the relationship between financial inclusion and income inequality can be complex and context-specific. Various factors such as regulatory environments, institutional frameworks, and socioeconomic conditions can influence the effectiveness of financial inclusion policies in reducing income inequality. Therefore, a comprehensive approach that combines improved access to financial services, financial literacy programs, and supportive policies is crucial for achieving meaningful results in reducing income inequality through financial inclusion.

Financial system innovation such as financial technology (FinTech) offers new revolutions in the financial institution operation and changed the way of customers engage with financial products and services. Technology has significantly improved the speed and efficiency of financial systems. Automation and digital processes allow streamlined operations, reducing manual errors and increasing overall efficiency. Ediagbonya and Tioluwani (2023) stated it is essential for financial inclusion in eradicating poverty, particularly in developing and emerging markets through financial technology. Besides, Global Findex (2021) revealed that the usage of technology among the excluded population is relatively high. Figure 1 shows the usage of mobile phones among the excluded population in different South Asian countries. As shown in Figure 1, among 90 percent of the excluded population in Afghanistan 60 percent of them have used mobile phones meanwhile in Bangladesh, among 47 percent

excluded population, only 15 percent of them did not have mobile phones. This shows that the development of technology has increased and is affordable for all income groups in the world. Thus, the use of technology in the financial system could be beneficial to financial inclusion with the aim to reduce poverty and income inequality in the country. Asongu and Odhiambo (2019) also found a negative relationship between the use of technology and inequality. Fintech has revolutionized payment systems, making it easier and more affordable for individuals to send and receive money. Digital payment platforms, such as mobile money and e-wallets, enable secure and convenient transactions, even for those without access to traditional banking services. This is particularly beneficial for low-income individuals, migrant workers, and those in rural areas who rely on remittances or need efficient payment options for their businesses.



Source: Global Findex 2021

**FIGURE 1:** The excluded population that have and did not have mobile phones in different countries in South Asia in 2021.

Poverty issues becomes worst since the pandemic Covid-19 occurred in 2020. The crisis slowed down all the economic activities around the world and affected the growth of economies particularly in developing countries. Many populations lose their income making the rate of poverty increase from 8.4 percent in 2019 to 9.3 percent in 2020 (World Bank, 2022). Despite the recovery policies has been done in many countries, the number of people living under the poverty line has increased by 70 million to 700 million population. According to the World Bank 2022, 685 million of the population are still living under the poverty line in 2022. United Nations has stated that those who live on less than \$2.15 per person at purchasing power parity are considered as living in extreme poverty. The crisis has increased the pressure on policymakers to restore economic growth and reduce poverty in the country. The use of internet and digital has increased during the pandemic, particularly in financial technology. Fintech has the potential to extend financial services to underserved populations who have limited or no access to traditional financial institutions. Through mobile banking, digital wallets, and online platforms, fintech enables individuals to access financial services conveniently and at lower costs. This is particularly beneficial for those in remote areas, where physical bank branches may be scarce or inaccessible. Besides, fintech solutions can significantly reduce transaction costs associated with financial services. By leveraging digital platforms and automation, fintech companies eliminate the need for physical infrastructure, paperwork, and manual processes, leading to cost savings. This cost efficiency enables financial institutions and fintech startups to offer affordable and accessible financial services to a broader range of individuals, including those with low incomes. Thus, fintech improves financial inclusion in terms of financial access, disseminating information, enhancing social linkages, and increasing rural e-commerce which could contribute to reducing poverty (Wang and He, 2020).

This paper contributes to the literature in several ways. First, we construct a comprehensive new financial inclusion index that takes the demand-side and supply-side factors that include most indicators considered in the literature including new indicators in FinTech as the role of financial technology has increasingly important in addressing the poverty and income inequality issues. Second, the threshold effect of financial inclusion on income inequality. The threshold will analyze the level of financial inclusion in affecting income distribution in the country. Finally, a comprehensive study about the role of financial inclusion with financial technology contributes to reducing income inequality, particularly in developing countries is presented in this paper.

## LITERATURE REVIEW

Financial inclusion has been widely discussed as a key element in economic growth and reducing income inequality by past researchers (Li, 2019; Yang and Fu, 2019; Nizam et. al., 2020; Verma and Giri, 2022; Jima and Makoni, 2023). The concept of financial inclusion is to ensure easy access, availability, and the use of formal financial services for all participants in the economy (Ozili, 2020; World Bank, 2019). Park and Mercado (2018) defined financial inclusion as the process of providing affordable, convenient, and timely financial services to all members of society, particularly the poor and vulnerable. Studies suggest that improving access to financial services, such as banking, credit, and insurance, can help low-income individuals and marginalized communities increase their income and accumulate wealth. By providing access to formal financial services, individuals can save, invest, and access credit for entrepreneurial activities, which can lead to increased income and reduced income inequality.

The advantages of boosting financial inclusion are numerous, since the access and the use of formal financial services can boost economic growth, poverty eradication, and income inequality reduction (Demirgüç-Kunt et. al., 2015). Financial inclusion has seen an improvement with the development of FinTech. Fintech offers affordable financial products and services to the excluded population (Ozili, 2021) which mostly come from the lower income bracket. The literature has presented a positive effect of financial inclusion in reducing poverty and income inequality (Akinrinola and Folorunso, 2022; Narain et. al., 2022; Demir et. al., 2020; Omar and Inaba, 2020; Ouechtati, 2020; Churchill and Marisetty, 2020; Park and Mercado, 2018; Neaime and Gaysset, 2018). An effective and efficient financial system boosts economic growth and reduces poverty (Erlando et. al., 2020). Khanh Chu (2019) compared the impact of financial inclusion based on income level in their studies and found that the inclusivity in formal financial services is based on income level, thus increasing income, particularly in low-income countries is important to reduce poverty.

The financial inclusion policy aims to increase key targets such as the number of banks per population and credit availability for the population, with a specific focus on low-income communities. By providing better access to financial services, it is expected that these communities will have greater opportunities to improve their income levels, ultimately leading to poverty alleviation which leads to the poverty rate decreases, the policy also seeks to reduce the rate of inequality in society (Park and Mercado, 2015; Neaime and Gaysset, 2008; Le et. al., 2019; Fouejieu et. al., 2020). Park and Mercado (2015) examine the effect of financial inclusion on 37 selected Asian countries where financial inclusion is significant in reducing poverty and income inequality. The same outcome is found in Le et. al. (2019) and Fouejieu et. al. (2020) studies in which financial inclusion has a negative and significant effect on poverty. It also highlighted the macroeconomic indicator effect on financial inclusion to income inequality globally. Research indicates that when more people have access to financial services, it can lead to inclusive economic growth. Financially inclusive economies tend to have higher employment rates, increased productivity, and reduced income inequality. By providing individuals with the tools and opportunities to participate in the formal financial system, financial inclusion can contribute to poverty reduction and improve overall economic well-being.

Although the importance of financial inclusion has been highlighted in boosting economic growth and reducing income inequality, the measurement of financial inclusion is still lacking some information that should be provided in measuring income inequality. Sarma (2016) measures the level of financial inclusion by including three important dimensions such as availability, accessibility, and usage in the measurement. By using a multidimensional index, Sarma (2016) found that financial

inclusion has a significant and positive effect on boosting economic growth in the country. This is supported by Nizam et. al. (2020) studies which include financial technology in the dimensions as the development of the financial system has changed over time. If financial technology is adequately implemented, it becomes essential in financial inclusion to reduce poverty, particularly in developing and emerging markets (Ediagbonya and Tioluwani, 2023). The measurement of financial inclusion however needs an improvement which includes all the possible indicators that provide information about the financial system (Sarma, 2016). However, it is important to note that there is no universally agreed-upon measurement framework for financial inclusion, and different studies and organizations may adopt different approaches and indicators based on their specific contexts and research objectives. The measurements of financial inclusion provide a starting point for assessing and comparing the level of financial inclusion across different populations and regions.

The development of financial technology has been instrumental in driving advancements in financial inclusion. These developments in fintech have significantly expanded the reach of financial services, reducing barriers and increasing access for previously underserved populations (Pazarbasioğlu et. al., 2020). By leveraging technology, data, and innovative business models, fintech has played a pivotal role in promoting financial inclusion and contributing to poverty reduction efforts worldwide (Asongu and Odhiambo, 2019). Fintech solutions promote digital payments, reducing reliance on cash and enabling individuals to participate in the formal economy (Chatterjee, 2020; Chatterjee and Anand, 2017). This is particularly important for individuals in poverty who may not have access to traditional banking services. Digital payments foster financial inclusion by providing a secure, convenient, and traceable means for individuals to receive wages, access government transfers, engage in commerce, and build a transaction history that can unlock future financial opportunities. Fintech expands access to essential financial services for underserved populations, including those living in poverty. Mobile banking, digital wallets, and other fintech solutions provide convenient and affordable channels for individuals to save, borrow, make payments, and manage their finances (Arner et. al., 2020; Thakor, 2020; Ozili, 2018). By enabling access to formal financial services, fintech helps individuals save, build assets, and access credit, empowering them to improve their economic situation and lift themselves out of poverty.

The relationship and the effect of financial inclusion on income inequality have been widely discussed by past researchers, however, there is still a lack of literature on the level of financial inclusion that needs to be achieved by countries to reduce income inequality. Thus, this study aims to analyze the threshold effect of financial inclusion for the country to reduce income inequality.

## DATA AND METHODOLOGY

This study employs cross-country estimations and utilized macro data from 55 selected developed and developing countries for the years 2014, 2017, 2021. The selection of countries was primarily dictated by the availability and reliability of data. The dependent variable used in this study is the Gini index as a proxy for income inequality. This data was obtained from Standardized World Income Inequality Database (SWIID). Meanwhile, the financial inclusion index is an independent variable. This index is constructed based on five dimensions, using a combination of the approach of demand and supply-side datasets. The dataset of five dimensions which are accessibility that consists of bank penetration, availability of banking services, usage of financial services, barrier for the population from using financial services and products in the financial system, and digital financial technology (fintech) is obtained from the Financial Access Survey (FAS) database of the International Monetary Fund (IMF) and Global Findex database respectively.

### Constructing A New Financial Inclusion Index (IFI)

This study involves first calculating a dimension index for each dimension of financial inclusion to develop an index. By following Sarma (2008, 2015), the equation for dimension index is written as:

$$d_{i,c,t} = w_{i,c,t} \frac{A_{i,c,t} - m_{i,c,t}}{M_{i,c,t} - m_{i,c,t}}, \quad w_{i,c,t}, 0 \leq w_{i,c,t} \leq 1 \quad (1)$$

where,

- $d_{i,c,t}$  = dimension  $i$  of financial inclusion in a country  $c$  at a time  $t$
- $w_{i,c,t}$  = weightage of the indicator  $i$  in a country  $c$  at time  $t$
- $A_{i,c,t}$  = actual value of the indicator  $i$  in a country  $c$  at time  $t$
- $m_{i,c,t}$  = minimum value of the indicator  $i$  in a country  $c$  at time  $t$
- $M_{i,c,t}$  = maximum value of the indicator  $i$  in a country  $c$  at time  $t$

The normalization process of the data is shown in equation (1) without the  $w_{i,c,t}$  by using the Min-Max approach to smooth out the varied scales and convert the highly skewed indicators and enable improved comparability of this data. By removing the minimum value and dividing it by the range of the indicators' values, this technique brings all of the indicators into an equal range between 0 and 1. (Le et al.,2019; Yorulmaz, 2018). The minimum value is zero for each dimension while the maximum value for each dimension is determined based on observations of the 90th percentile of the dimension value distribution as the upper bound for the dimension.

$$x_1 = \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{w_1^2 + w_2^2 + \dots + w_n^2}} \tag{2}$$

$$x_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}} \tag{3}$$

$$IFI = \frac{1}{2} [x_1 + x_2] \tag{4}$$

Equation (2) implies the normalization of a simple average Euclidian distance of  $x$  where the distance is between the worst point 0 and the ideal point  $w$  to ensure the value of  $x_1$  lie between 0 and 1. Higher value of  $x_1$  indicates more financial inclusion. Equation (3) implies the inverse of the normalization of Euclidian distance of  $x$ . In this equation, the numerator of the second component is the Euclidean distance between  $X$  and the ideal point  $W$ , normalized by the denominator and subtracted by 1 which will result in the inverse normalized distance. Similar to equation (2) the normalization will result in the value of  $x_2$  lie between 0 and 1. Equation (4) concludes the value of the IFI index which takes a simple average of  $x_1$  and  $x_2$  from the worst point 0 to the ideal point  $w$ .

Therefore, if the assumption all of the dimensions are important in measuring the financial inclusion index, we can simplify that  $w_i = 1$  for all  $i$ . In this scenario, the ideal state is represented by the point  $W = (1,1,1, \dots, 1)$  in  $n$ -dimensional space, and the IFI formula can be written as:

$$IFI = \frac{1}{2} \left[ \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{n}} + \left( 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \dots + (1-d_n)^2}}{\sqrt{n}} \right) \right] \tag{5}$$

The weightage of the indicator  $w_i$  in the equation are determined endogenously with the parametric method PCA ( $z$ ). Five dimensions: bank penetration ( $p_k$ ), availability ( $a_k$ ), usage ( $u_k$ ), barrier ( $b_k$ ) and fintech ( $f_k$ ) has taken into account which includes all the possible indicators that provide information about the financial system to measure the financial inclusion index. Thus, the equation of the financial inclusion index for a country can be represented as the equation (6):

This study involves first calculating a dimension index for each dimension of financial inclusion to develop an index. By following Sarma (2008, 2015), the equation for dimension index is written as:

$$d_{i,c,t} = w_{i,c,t} \frac{A_{i,c,t} - m_{i,c,t}}{M_{i,c,t} - m_{i,c,t}}, \quad w_{i,c,t}, 0 \leq w_{i,c,t} \leq 1 \tag{1}$$

where,

- $d_{i,c,t}$  = dimension  $i$  of financial inclusion in a country  $c$  at a time  $t$

$w_{i,c,t}$  = weightage of the indicator  $i$  in a country  $c$  at time  $t$   
 $A_{i,c,t}$  = actual value of the indicator  $i$  in a country  $c$  at time  $t$   
 $m_{i,c,t}$  = minimum value of the indicator  $i$  in a country  $c$  at time  $t$   
 $M_{i,c,t}$  = maximum value of the indicator  $i$  in a country  $c$  at time  $t$

The normalization process of the data is shown in equation (1) without the  $w_{i,c,t}$  by using the Min-Max approach to smooth out the varied scales and convert the highly skewed indicators and enable improved comparability of this data. By removing the minimum value and dividing it by the range of the indicators' values, this technique brings all of the indicators into an equal range between 0 and 1. (Le et al., 2019; Yorulmaz, 2018). The minimum value is zero for each dimension while the maximum value for each dimension is determined based on observations of the 90th percentile of the dimension value distribution as the upper bound for the dimension.

$$x_1 = \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{w_1^2 + w_2^2 + \dots + w_n^2}} \quad (2)$$

$$x_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}} \quad (3)$$

$$IFI = \frac{1}{2} [x_1 + x_2] \quad (4)$$

Equation (2) implies the normalization of a simple average Euclidian distance of  $x$  where the distance is between the worst point 0 and the ideal point  $w$  to ensure the value of  $x_1$  lie between 0 and 1. Higher value of  $x_1$  indicates more financial inclusion. Equation (3) implies the inverse of the normalization of Euclidian distance of  $x$ . In this equation, the numerator of the second component is the Euclidean distance between  $X$  and the ideal point  $W$ , normalized by the denominator and subtracted by 1 which will result in the inverse normalized distance. Similar to equation (2) the normalization will result in the value of  $x_2$  lie between 0 and 1. Equation (4) concludes the value of the IFI index which takes a simple average of  $x_1$  and  $x_2$  from the worst point 0 to the ideal point  $w$ .

Therefore, if the assumption all of the dimensions are important in measuring the financial inclusion index, we can simplify that  $w_i = 1$  for all  $i$ . In this scenario, the ideal state is represented by the point  $W = (1, 1, 1, \dots, 1)$  in  $n$ -dimensional space, and the IFI formula can be written as:

$$IFI = \frac{1}{2} \left[ \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{n}} + \left( 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \dots + (1-d_n)^2}}{\sqrt{n}} \right) \right] \quad (5)$$

The weightage of the indicator  $w_i$  in the equation are determined endogenously with the parametric method PCA ( $z$ ). Five dimensions: bank penetration ( $p_k$ ), availability ( $a_k$ ), usage ( $u_k$ ), barrier ( $b_k$ ) and fintech ( $f_k$ ) has taken into account which includes all the possible indicators that provide information about the financial system to measure the financial inclusion index. Thus, the equation of the financial inclusion index for a country can be represented as the equation (6):

$$IFI_k = \frac{1}{2} \left[ \frac{\sqrt{p_k^2 + a_k^2 + u_k^2 + b_k^2 + f_k^2}}{\sqrt{n}} + \left( 1 - \frac{\sqrt{(z-p_k)^2 + (z-a_k)^2 + (z-u_k)^2 + (z-b_k)^2 + (z-f_k)^2}}{\sqrt{n}} \right) \right] \quad (6)$$

The index of financial inclusion can be categories into three categories which are:

- i)  $0 \leq IFI \leq 0.3$ ; Low financial inclusion (LFI)
- ii)  $0.3 < IFI \leq 0.6$ ; Medium financial inclusion (MFI)



iii)  $0.6 < IFI \leq 1$ ; High Financial inclusion (HFI)

The higher value of the financial inclusion index indicates higher inclusiveness of financial services in that country and vice versa. The choice of the index is based on Sarma (2012, 2016).

$$IFI_k = \frac{1}{2} \left[ \frac{\sqrt{p_k^2 + a_k^2 + u_k^2 + b_k^2 + f_k^2}}{\sqrt{n}} + \left( 1 - \frac{\sqrt{(z-p_k)^2 + (z-a_k)^2 + (z-u_k)^2 + (z-b_k)^2 + (z-f_k)^2}}{\sqrt{n}} \right) \right] \quad (6)$$

The index of financial inclusion can be categories into three categories which are:

- iv)  $0 \leq IFI \leq 0.3$ ; Low financial inclusion (LFI)
- v)  $0.3 < IFI \leq 0.6$ ; Medium financial inclusion (MFI)
- vi)  $0.6 < IFI \leq 1$ ; High Financial inclusion (HFI)

The higher value of the financial inclusion index indicates higher inclusiveness of financial services in that country and vice versa. The choice of the index is based on Sarma (2012, 2016).

### Cross-Section Threshold Regression

This study applied the cross-section threshold regression method to shed light on the non-monotonic effect of financial inclusiveness on economic growth. Financial inclusiveness and economic growth issues are dynamic by nature and to understand the adjustment, this method could be used. Allowing for dynamics in the underlying process may be crucial for recovering consistent estimates of other parameters.

The first step of the estimation is to test the null hypothesis of linearity  $H_0: \beta_1 = \beta_2$  against the threshold model. If the null hypothesis is rejected, then statistically, there is evidence of threshold level regression with two regimes and the model is non-linear. When a threshold value exists, the sample is estimated to be  $IFI_{(Fintech)_i} \leq \gamma$  referring to the first regime and  $IFI_{(Fintech)_i} > \gamma$  the second regime. Statistically, both regimes give different decisions in estimation.

This study follows Hansen (1996, 2000) who suggests a heteroscedasticity-consistent Lagrange Multiplier (LM) bootstrap procedure to test the null hypothesis of a linear formulation against a threshold regression alternative. Since the threshold parameter  $\gamma$  is not identified under the null hypothesis of the no-threshold effect, the  $p$  values are computed by a fixed bootstrap method. Hansen (2000) shows that this procedure yields asymptotically correct  $p$  values. If the hypothesis of  $\beta_1 = \beta_2$  is rejected and a threshold level is identified, then we should test again the threshold regression model against a linear specification after dividing the original sample according to the threshold identified. This procedure is carried out until the null of  $\beta_1 = \beta_2$  can no longer be rejected.

### EMPIRICAL RESULTS

Based on the value of financial inclusion index,  $IFI \text{ index} = 0$ ; denotes complete financial exclusion, while  $IFI \text{ index} = 1$ ; indicates complete financial inclusion. The higher value of the financial inclusion index, the more inclusive of financial services in a particular country. The level of Financial Inclusion Index (IFI) is presented in figure 2. Based on the observation in figure2, different countries have a different level of financial inclusion. Among the 55 countries for which IFI has been computed, in the year 2014, Kenya ranked the highest IFI with a value of 0.9791, while Algeria ranked the lowest IFI with a value of 0.1769. Meanwhile, in the year 2017, Turkey ranked the highest IFI with a value of 0.7773, and Algeria also ranked the lowest IFI with a value of 0.1705. In 2021, China ranked the highest with 0.8453 and Algeria remained the lowest IFI with a value 0.2069.

### Hansen (2000) Threshold Regression

The impact of financial inclusion on income inequality has been estimated using Equation (4) to each model for the years 2014, 2017, 2021 respectively. As mentioned previously, we employed a splitting of the sample threshold method proposed by Hansen (1996, 2000). To investigate the threshold effect of financial inclusion upon economic growth. The result of each model for years 2014, 2017, 2021 are presented in Tables 1–6. The findings reveal several interesting observations. First, Tables 1, 3, and 6 tested the hypotheses null of no threshold against the alternative of threshold allowing heteroskedastic errors (White corrected). It shows that the p-value of the hypothesis of no threshold effects as computed by the bootstrap method with 5000 replications and 15% trimming percentage are rejected at a highly significant level for both years. These findings clearly indicate that the relationship between income inequality and financial inclusiveness is non-linear, and therefore the imposition of a priori mono-tonic restriction on the relationship also could be ambiguous. The finding provides a better explanation for a dynamic relationship between financial inclusion and income inequality, where financial inclusion could effectively contribute to income distribution only at a certain level of the index or any of its interaction terms. We also tested whether the high IFI group could be split further into sub-regimes. The bootstrap p-values were insignificant for the second sample split, thus it suggests that only the single threshold is adequate for the model of the year 2014, 2017 and 2021.

**TABLE 1:** Threshold estimates of financial inclusion index (IFI) for 2014.

2014	first split	second split
Number of Bootstrap Replications: 5000	5000	5000
Trimming Percentage:	0.15	0.15
Threshold Estimate:	0.514998	0.613048971
LM-test for no threshold:	12.796325	6.6411562
Bootstrap P-Value:	0.0948	0.9558

Test of Null of No Threshold Against Alternative of Threshold		
Allowing Heteroskedastic Errors (White Corrected)		
2014	first split	second split
Number of Bootstrap Replications: 5000	5000	5000
Trimming Percentage:	0.15	0.15
Threshold Estimate:	0.514998	0.613048971
LM-test for no threshold:	12.796325	6.6411562
Bootstrap P-Value:	0.0948	0.9558

**TABLE 2:** Regression results using the financial inclusion index (IFI) as a threshold variable.  
Dependent variable: Income inequality (2014)

Independent Variables	OLS	St Error	Regime 1	Regime2
Intercept	2.6372	0.5139	0.2440	2.0545
ifi	0.2892	0.1545	0.8704	0.4318
gdp	0.0173	0.0083	0.0061	0.0245
lcpi	0.0831	0.0878	0.7242	0.1102
lgs	0.0171	0.0145	-0.0119	0.0301
popg	0.0359	0.0154	-0.0728	0.0446
Observations:	55			

Degrees of Freedom:	49			
Sum of Squared Errors:	1.7613			
Residual Variance:	0.0359			
R-squared:	0.1741			
Heteroskedasticity Test (P-Value):	0.9641			

Based on the threshold effect, a one-unit increase in IFI will reduce income inequality by 0.8704 percent and 0.4318 percent in a high and low regime of financial inclusion respectively.

## CONCLUSION

This study provides new evidence of the nonlinear impact of financial inclusiveness on income inequality through the threshold level of financial inclusion index for 55 countries for the years 2014, 2017, and 2021. The cross-section model based on the concept of threshold effect proposed by Hansen (2000) was used to capture the relationship between financial inclusion index (IFI) and income inequality across countries. The threshold point tests the different effects of financial inclusion on income inequality with a comparison between low-level IFI countries and the high-level ones. These findings, therefore, underline the importance of policymakers to focus on the turning point and aspects of financial inclusion to ensure the greater performance of the economy.

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# PROJEK PEMBASMIAN KEMISKINAN DI SABAH: ISU DAN CABARAN

*(POVERTY ERADICATION PROJECT IN SABAH: ISSUES AND CHALLENGES)*

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## **ABSTRACT**

*Since independence, the government has invested billions of ringgit in the fight against poverty. Despite a decrease in the percentage of the population living in poverty at the national level, Sabah has had the highest poverty rate in Malaysia since 1997. Why is the poverty alleviation program less effective in reducing this social phenomenon among the poor communities in the state of Sabah? Based on these questions, this paper attempts to discuss the issues and challenges confronting stakeholders involved in the state of Sabah's poverty eradication program. This paper focuses on the Inisiatif Pendapatan Rakyat (IPR) Phase 1 project in two communities namely Kg. Penimbawan, Tuaran, and Kg. Bongkol, Pitas. This qualitative study discovered that participants, implementing agencies, and other stakeholders face issues and challenges when implementing poverty eradication projects. This study discovered that among the issues faced by participants in the poverty eradication project are issues with participants' attitudes towards the project, such as less focus on the project, lack of interest, the existence of a subsidy mentality, and the lack of clarity of the project's goals. However, it was discovered that the implementing agency had issues with market support. The difficulties these three parties are currently facing could have an effect on how long the IPR Project can successfully eradicate poverty in both localities.*

*Keywords: Poverty; Poverty Eradication Project; Inisiatif Pendapatan Rakyat; Project Sustainability*

## **ABSTRAK**

Kerajaan telah membelanjakan berbilion ringgit bagi mengurangkan kemiskinan sejak merdeka. Meskipun berlaku penurunan peratusan kemiskinan di peringkat nasional, namun negeri Sabah masih mencatatkan kadar kemiskinan tertinggi di Malaysia sejak tahun 1997. Mengapakah program pembasmian kemiskinan yang diperkenalkan kurang berkesan dalam mengurangkan fenomena sosial ini dalam komuniti miskin di negeri Sabah? Bertitik tolak daripada persoalan tersebut, kertas kerja ini cuba membincangkan isu dan cabaran yang dihadapi oleh pemegang taruh yang terlibat dalam program pembasmian kemiskinan di negeri Sabah. Penelitian dalam kertas kerja ini memberi perhatian terhadap projek Inisiatif Pendapatan Rakyat (IPR) Fasa 1 di dua lokaliti iaitu Kg. Penimbawan, Tuaran dan Kg. Bongkol, Pitas. Kajian yang dikendalikan menggunakan pendekatan kualitatif ini mendapati wujud isu dan cabaran yang dihadapi oleh peserta, agensi pelaksana dan pemegang taruh lain dalam melaksanakan projek pembasmian kemiskinan. Isu sikap peserta terhadap projek yang disertai seperti kurang fokus terhadap projek, kurang minat, kewujudan minda subsidi dan ketidakjelasan matlamat projek

merupakan antara isu yang dihadapi peserta dalam projek pembasmian kemiskinan yang disertai. Manakala di pihak agensi pelaksana pula didapati wujud masalah dari segi sokongan pasaran dan pemasaran produk projek. Jelasnya, kepelbagaian cabaran yang dihadapi ketiga-tiga pemegang taruh ini boleh memberi kesan terhadap kemampuan projek pembasmian kemiskinan Projek IPR pada masa hadapan di lokasi kajian.

*Kata Kunci: Kemiskinan; Projek Pembasmian Kemiskinan; Inisiatif Pendapatan Rakyat; Kemampuan Projek*

## PENGENALAN

Pengurangan insiden kemiskinan telah menjadi hasrat kebanyakan negara dan ia diangkat sebagai agenda penting dalam pelan pembangunan sesebuah negara. Keseriusan matlamat membasmi kemiskinan khususnya miskin tegar diterjemahkan di peringkat global bila mana Pertubuhan Bangsa-Bangsa Bersatu meletakkan ia sebagai perkara pertama dalam Matlamat Pembangunan Mampan (SDG) yang perlu dihapuskan menjelang tahun 2030. Bagi Malaysia, usaha pembasmian kemiskinan bukan perkara baharu, malah ia telah dijadikan agenda negara yang dimasukkan dalam Rancangan Malaysia. Misalnya Rancangan Malaysia Pertama (1966-1970) menyebut kerajaan akan meneruskan segala usaha untuk mengurangkan kemiskinan dengan menyediakan kemudahan dan peluang kepada kumpulan miskin. Selaras dengan itu, banyak program yang diperkenalkan bagi maksud mengurangkan fenomena sosial ini dalam masyarakat. Pengenalan Dasar Ekonomi Baru (1970-1990) membuktikan betapa seriusnya kerajaan Malaysia dalam usaha menangani isu kemiskinan di negara ini. Pembasmian kemiskinan dan penyusunan semula masyarakat merupakan objektif utama dalam DEB telah memberi impak signifikan terhadap penurunan peratusan kemiskinan dalam negara. Buktinya, peratus kemiskinan berkurang dengan ketara iaitu menurun daripada 49.3 peratus pada tahun 1970 kepada 12.4 peratus pada 1992 iaitu dua tahun selepas tamatnya DEB (Jabatan Perangkaan Malaysia, 2023). Selepas DEB, kerajaan telah memperkenalkan Dasar Pembangunan Negara (1991-2000) bagi meneruskan usaha mencapai pembangunan seimbang yang bertujuan membasmi kemiskinan tegar dan mengurangkan kemiskinan relatif antara etnik. Sehingga tahun 2020, program pembasmian kemiskinan di Malaysia adalah di bawah rangka kerja Dasar Wawasan Negara (2001-2020) (Wan Nor Azriyati et al., 2011). Terkini, Inisiatif Pendapatan Rakyat (IPR) diperkenalkan yang bermatlamat (i) menambah pendapatan keluarga miskin tegar dan B40 serta (ii) menyelesaikan masalah ekonomi harian menerusi inisiatif yang disediakan kerajaan (Kementerian Ekonomi, 2023).

Impak positif daripada pengenalan pelbagai program pembasmian kemiskinan ini dijelmakan menerusi kejayaan Malaysia menurunkan angka kemiskinan. Insiden kemiskinan mutlak menyaksikan pengurangan daripada angka 5.6 peratus pada tahun 2019 berbanding 7.6 peratus pada tahun 2016 (Rancangan Malaysia Ke-12, 2021-2025). Pencapaian mengurangkan kadar kemiskinan ini dikaitkan dengan usaha berterusan dan kejayaan program-program pembangunan yang dilaksanakan oleh pemerintah di seluruh negara (Sharifah Rohayah & Khoo, 2016; Zulkarnain & Isahaque, 2013; Wan Nor Azriyati et al., 2011; Mohamed Zaini, 2010; Ishak & H. Osman-Rani, 1996). Meskipun begitu, akibat daripada pandemik COVID-19, Jabatan Perangkaan Malaysia mengesahkan insiden kemiskinan mutlak di Malaysia kembali meningkat kepada 8.4 peratus pada 2020 (Rancangan Malaysia Ke-12, 2021-2025). Bagaimanapun, ini tidak menafikan peranan pemerintah dalam program pembasmian kemiskinan yang bersifat progresif (Sharifah Rohayah & Khoo, 2016) selama ini. Umumnya, projek pembasmian kemiskinan yang diperkenalkan pemerintah boleh berbentuk atas-bawah (*top-down*), bawah-atas (*bottom-up*) mahupun pendekatan rakan kongsi. Setiap jenis pendekatan dalam pelaksanaan projek ini mempunyai kekuatan dan kelemahan tersendiri yang boleh menjejaskan mahupun memberi kejayaan kepada sesuatu projek yang diperkenalkan. Di Malaysia, kajian mendapati banyak program-program pembangunan (Haris, 2007) termasuk projek pembasmian kemiskinan bersifat atas-bawah (Mohd. Zin & John, 2015) dan ini menurut Cho (1990) hanya menghadkan penglibatan komuniti miskin di peringkat akar umbi. Keterbatasan penglibatan komuniti miskin dalam pembangunan boleh mengagalkan usaha untuk mengeluarkan kelompok ini daripada kancas kemiskinan. Berbeza dengan pendekatan atas-bawah dalam pembangunan, pendekatan bawah-atas dan rakan kongsi dilihat sebagai pendekatan yang memberi manfaat jangka panjang dan memupuk penglibatan aktif komuniti

(Asnarulkhadi, 2011; Haris & Abd Hadi, 2012; Haris, 2015) dalam projek pembasmian kemiskinan yang disertai. Jelasnya, usaha untuk mengurangkan kemiskinan bukan semata-mata merupakan tanggungjawab pemerintah tetapi juga golongan miskin sendiri. Pengenalan pelbagai projek pembasmian kemiskinan tidak akan berjaya tanpa penglibatan aktif dan serius daripada isi rumah miskin serta agensi pelaksana. Sejauh manakah peserta dan agensi pelaksana boleh memastikan kejayaan projek pembasmian kemiskinan yang diperkenalkan kerajaan? Justeru itu, kajian ini menengahkan isu dan cabaran yang dihadapi oleh peserta dan agensi pembangunan dalam pelaksanaan Projek Inisiatif Pendapatan Rakyat-Basmi Miskin Tegar yang merupakan projek pembasmian kemiskinan terkini di Malaysia.

## PROJEK PEMBASMIAN KEMISKINAN: SOROTAN KAJIAN LEPAS

Isu kemiskinan merupakan fenomena sosial yang masih menjadi perhatian dan menarik minat ahli akademik, ahli politik dan masyarakat di peringkat global dan lokal. Di Malaysia, topik ini kembali hangat dan dibincangkan secara terbuka dalam wacana di media mahupun menerusi penyelidikan serta penulisan ilmiah di universiti tempatan mempunyai hubungan dengan lima peristiwa penting yang berlaku di negara ini. *Pertama*, laporan yang dikeluarkan oleh Prof. Philip Alston, Pelapor Khas Pertubuhan Bangsa-Bangsa Bersatu selepas kunjungannya ke lima buah negeri iaitu Kuala Lumpur, Selangor, Kelantan, Sarawak dan Sabah pada Ogos 2019. Penemuan beliau mendapati insiden kemiskinan di Malaysia adalah lebih tinggi daripada statistik rasmi yang dikeluarkan kerajaan. Untuk itu, beliau mengesa agar Malaysia mengkaji semula pelbagai dimensi indeks kemiskinan dan Pendapatan Garis Kemiskinan (PGK) bagi mengetahui realiti sebenar isu ini (Zanariah, 23 Ogos 2019). Alston berpendapat, maklumat yang tidak tepat mengenai kadar kemiskinan menyebabkan dasar kerajaan hanya dilaksanakan secara umum dan tidak khusus untuk membasmi kemiskinan golongan tertentu (United Nations, 2020). *Kedua*, semakan semula Pendapatan Garis Kemiskinan (PGK) pada tahun 2019. Berdasarkan metodologi PGK tahun 2019, PGK nasional adalah RM2,208 (Rancangan Malaysia Ke-12, 2021-2025). *Ketiga*, pandemik COVID-19 yang melanda dunia pada penghujung Disember 2020 dan siri-siri Perintah Kawalan Pergerakan dalam negara. Jelasnya, pandemik ini telah memberi kesan langsung terhadap ekonomi Malaysia dan menjejaskan kehidupan penduduk negara ini (Fathullah, 2021) sama ada di kawasan bandar (lihat Puteri Marjan & Theebalaksham, 2020; UNICEF Malaysia, 2021) mahupun luar bandar (lihat Ubong et al., 2021). Buktinya, ekoran krisis yang dicituskan daripada Pandemik COVID-19, peningkatan kadar kemiskinan berlaku hampir tiga peratus dalam tempoh setahun yang menyaksikan ia menokok kepada 8.4% pada tahun 2020 berbanding hanya 5.6% pada tahun 2019 (Jabatan Perangkaan Malaysia, 2020). *Keempat*, respon dan tindakan Malaysia ke atas pencapaian Matlamat Pembangunan Mampan (SDG). Malaysia perlu menunjukkan komitmen memerangi miskin tegar dan mencapai sasaran menoktahkan miskin tegar menjelang 2030. Akhir sekali, peristiwa yang tidak kurang penting adalah pengenalan Indeks Kemiskinan Pelbagai Dimensi (MPI) pada tahun 2016 bagi mengukur kemiskinan daripada perspektif yang lebih inklusif. Indeks ini mengukur kemiskinan berdasarkan empat dimensi iaitu pendapatan, pendidikan, kesihatan dan taraf hidup (Rancangan Malaysia Ke-12, 2021-2022). Implikasi daripada kelima-lima peristiwa ini bukan sahaja mengundang perdebatan ahli akademik-politik-ekonomi tetapi lebih signifikan ia telah membawa perubahan dalam pendekatan dan tindakan pemerintah melawan kemiskinan. Satu program pembasmian kemiskinan yang bersifat holistik, komprehensif dan inklusif amat diperlukan.

Umumnya, projek yang berkaitan dengan pembasmian kemiskinan di Malaysia boleh dibahagikan kepada enam kategori utama (Rujuk Jadual 1). Jelas daripada pengkategorian ini menunjukkan bahawa projek-projek pembasmian kemiskinan di Malaysia tidak sahaja bersifat *ecocentric* yang memberi fokus kepada pembangunan ekonomi tetapi turut berorientasi pembangunan manusia (*homocentric*) yang menekankan pembentukan komuniti berdikari dan bermaklumat (Asnarulkhadi, 2010). Peralihan penting dalam pembangunan sebegini adalah mengambil kira penglibatan golongan sasaran dalam proses perancangan, pelaksanaan dan pembuatan keputusan yang membabitkan kumpulan ini. Justeru itu, penglibatan peserta dan komuniti dalam projek pembasmian kemiskinan berupaya meningkatkan pendapatan dan dalam masa sama meningkatkan kemahiran dan pengetahuan.

**JADUAL 1:** Kategori Program Pembasmian Kemiskinan di Malaysia

Kategori Program Pembasmian Kemiskinan
1. Program Penyediaan Kemudahan Asas, Infrastruktur Sosial dan Khidmat Sosial
2. Program Peningkatan Produktiviti
3. Program Reformasi Tanah
4. Program Peningkatan Pendapatan (Berbentuk Bantuan Kewangan)
5. Program Khusus Rakyat Termiskin - Program Pembangunan Rakyat Termiskin
6. Program Khusus Rakyat Termiskin - Skim Pembangunan Kesejahteraan Rakyat

(Sumber: Ubahsuai daripada Asnarulkhandi, 2010)

Di Malaysia terdapat sebanyak enam kementerian dan 40 agensi yang dikenalpasti mempunyai peranan langsung dalam membasmi kemiskinan (Mohamed Zaini, 2010). Kepelbagaian kementerian/agensi ini menurut Mohamed Zaini (2010) dan Rosazman et al. (2009) menyebabkan wujudnya pertindihan pelaksanaan projek yang boleh menjejaskan keberkesanan projek.

Kajian Zakiyah dan Norzalinda (2021) mendapati Geran Pelancaran (GP) dalam bentuk wang ringgit sebanyak RM2,700 yang disediakan oleh Jabatan Kebajikan Masyarakat (JKM) kurang berjaya dalam mengeluarkan peserta yang terdiri daripada ibu tunggal dan OKU daripada miskin tegar. Kajian yang melibatkan seramai 234 orang responden di tiga negeri Zon Utara (Perlis, Kedah dan Pulau Pinang) dan tiga negeri Zon Timur (Terengganu, Kelantan dan Pahang) ini menunjukkan sebanyak 84.0% responden masih mempunyai pendapatan RM1,000 dan ke bawah selepas menyertai program GP. Kajian tersebut mengenalpasti wujud dua masalah utama yang dihadapi responden sama ada sebelum mahupun selepas mengikuti program GP iaitu masalah kewangan (51.4%) dan kekurangan modal pusingan (56.0%). Hal ini dikaitkan dengan ketiadaan pemantauan terhadap peserta GP dan program susulan berkaitan keusahawanan. Untuk itu, Zakiyah dan Norzalinda (2021) mencadangkan pelaksanaan pemantauan perlu diseirinkan bersama pengenalan sesuatu projek dan program keusahawanan untuk memotivasikan peserta GP. Hal ini penting demi memastikan kemampunan dan kebolehan projek untuk berkembang pada masa hadapan.

Peri penting sikap positif dalam menentukan kejayaan sesuatu projek pembasmian kemiskinan ditunjukkan dalam kajian Azlina et al. (2019) ke atas peserta Projek Peningkatan Pendapatan (PPP) Orang Asli di Perak. Seramai 110 Orang Asli yang disoal selidik terdiri daripada peserta yang terlibat dalam tiga projek iaitu projek tanaman (56.4%), projek penternakan (41.9%) dan projek pastri (1.7%). Kajian ini menunjukkan responden mempunyai sikap positif yang memberi kesan terhadap peningkatan pendapatan selepas menyertai PPP. Buktinya, peratusan kategori pendapatan bulanan RM1,000 hingga RM1,999 meningkat daripada 8.2% sebelum kepada 14.5% selepas peserta menyertai PPP. Malahan sebanyak 48.2% responden mengakui bahawa berlakunya pertambahan pendapatan sejak mereka mengikuti projek masing-masing. Satu perkara penting daripada kajian Azlina et al. (2019) adalah wujudnya projek aktif yang mencecah lebih dua tahun (20.9%) malah ada yang aktif empat tahun (20.9%). Hal ini menunjukkan keberlanjutan dan kemampunan projek boleh berlaku sekiranya peserta memiliki sikap positif kerana ia mempengaruhi penglibatan aktif mereka dalam projek yang seterusnya meningkatkan taraf hidup peserta dan isi rumah. Daripada kedua-dua kajian yang diusahakan ini, jelas menunjukkan bahawa program pembasmian kemiskinan yang bersifat meningkatkan pendapatan sedia ada masih kurang berupaya mengeluarkan peserta yang terlibat daripada kehidupan miskin tegar yang dilalui.

Pengetahuan yang dimiliki peserta tentang sesuatu projek pembasmian kemiskinan menjadi salah satu faktor penglibatan aktif peserta seterusnya penentu penting kejayaan projek. Menurut Kwok & Haris, (2014), pengetahuan mempunyai perkaitan langsung dengan darjah penglibatan. Kedua-dua penyelidik menegaskan tanpa adanya kesedaran dan pengetahuan tentang program pembasmian kemiskinan, ahli masyarakat setempat berkemungkinan tidak akan melibatkan diri dalam menjayakan program yang diperkenalkan ke atas mereka. Kajian Kwok & Haris (2014) ke atas 260 ketua isi rumah

etnik Iban di daerah Song, Sarawak mendapati semua responden tidak mengetahui nama kementerian yang bertanggungjawab melaksanakan program Skim Pembangunan Kesejahteraan Rakyat (SPKR). Selain itu, lebih 66.0% responden pula tidak mengetahui objektif program yang disertai. Bagaimanapun, kajian tersebut menyaksikan sebanyak 63.1% responden mengenali pegawai yang bertugas di lapangan. Hal ini kerana pegawai terbabit dikatakan sering mengadakan perbincangan mengenai hal ehwal rumah panjang dan memantau program-program yang dilaksanakan di bawah. Meskipun begitu, kajian Kwok & Haris (2014) ini tidak menunjukkan hubung kait di antara pengetahuan dan tahap penglibatan responden dalam (SPKR) di lokasi kajian.

Penglibatan dalam projek pembasmian kemiskinan memerlukan usaha berterusan daripada peserta dan komuniti miskin. Kajian Jalilah, Diana dan Rohana (2021) mendapati peserta terlibat secara aktif dalam projek penternakan lokan di Kg. Kopunadan, Kudat, Sabah seawal program tersebut diperkenalkan. Setiap proses pelaksanaan projek menyaksikan penglibatan peserta dan memberi kebebasan kepada peserta untuk turut serta dalam merancang dan membuat keputusan tentang keperluan projek. Peserta dibekalkan dengan maklumat berkenaan projek yang membolehkan mereka bersedia berhadapan dengan limitasi projek. Bagi menjamin kelestarian projek pula, kajian tersebut mendapati peserta membina dan mengukuhkan jaringan bersama pemegang taruh yang mempunyai kaitan dengan projek terutamanya Pejabat Daerah, Jabatan Perikanan dan ahli politik tempatan. Projek penternakan lokan ini juga telah berjaya dikembangkan ke program bentuk baharu dengan memperkenalkan Pesta Lokan yang bertujuan menjana pendapatan tambahan di samping meneguhkan budaya etnik Rungus. Penemuan kajian Jalilah, Diana Demiyah dan Rohana (2021) ini seiring dengan apa yang ditegaskan Haris (2007) tentang pentingnya penglibatan komuniti dalam satu-satu projek kerana menerusi penglibatan sahaja pembangunan boleh dicapai dan bertahan.

Kajian Nor Aini dan & Doris (2012) ke atas ibu tunggal di Semenanjung Malaysia yang menggunakan analisis jurang mendapati wujud empat masalah utama berkaitan projek yang disertai golongan ini. Pertama, ketidaksesuaian bentuk projek dengan usia peserta. Kedua, tempoh masa program yang singkat menyebabkan penyampaian maklumat tidak dapat dilakukan dengan baik. Ketiga, ketidakhadiran ke program yang dianjurkan ekoran ketiadaan sokongan sosial untuk menguruskan penjagaan anak-anak peserta yang kecil ataupun menghidap penyakit kronik. Akhir sekali, kekurangan pengetahuan berkenaan program yang disertai yang mengakibatkan peserta tidak berminat menyertai program. Daripada kajian lepas yang dibincangkan, jelas menunjukkan pentingnya penglibatan peserta dalam projek yang diperkenalkan kepada mereka. Penglibatan peserta lebih bermakna dan efektif sekiranya mereka faham tentang projek yang disertai. Dengan demikian, komitmen dan sikap ambil peduli perlu dipupuk ke atas setiap peserta agar mereka lebih bersedia berhadapan dengan cabaran dan berusaha mempertahankan seterusnya memperkembangkan potensi projek yang disertai.

## **METODOLOGI KAJIAN**

Penelitian terhadap projek IPR-BMT di Sabah ini dilakukan menggunakan pendekatan kualitatif. Data dikutip menggunakan kaedah temu bual dan pemerhatian di lapangan. Temu bual dijalankan berpandukan rangka temu bual berstruktur bersama dua orang pegawai lapangan dan seorang pegawai eKasih yang terlibat secara langsung dengan projek IPR-BMT. Setiap sesi temu bual berlangsung di antara 30 hingga 40 minit. Data temu bual ini kemudiannya ditranskrip dan dianalisis secara manual bagi membolehkan penginterpretasian data secara mendalam dan penerokaan serta pencarian makna boleh dilakukan (Othman, 2009). Oleh kerana temu bual dilaksanakan secara berstruktur, maka tema-tema utama perbualan telah dikenalpasti lebih awal yang merangkumi tiga tema utama iaitu (i) peranan yang dimainkan agensi dalam melaksanakan projek pembasmian kemiskinan; (ii) cabaran melaksanakan projek; dan (iii) pengalaman projek pembasmian kemiskinan masa lepas. Menyedari bahawa sumber daripada dokumen boleh menyokong dan menambah bukti serta mengesahkan maklumat yang diperolehi menerusi temubual (Suseela, 2013) dan pemerhatian (Othman, 2009), maka kajian ini turut menggunakan dokumen sebagai data dalam kajian ini. Untuk itu, penelitian terhadap dokumen seperti laporan bertulis yang disediakan oleh pegawai lapangan, statistik kemiskinan di Sabah daripada Unit eKasih Tuaran dan Rancangan Malaysia turut dilakukan. Perbincangan projek pembasmian kemiskinan IPR-BMT dalam kajian ini merujuk kepada isu dan cabaran yang dihadapi



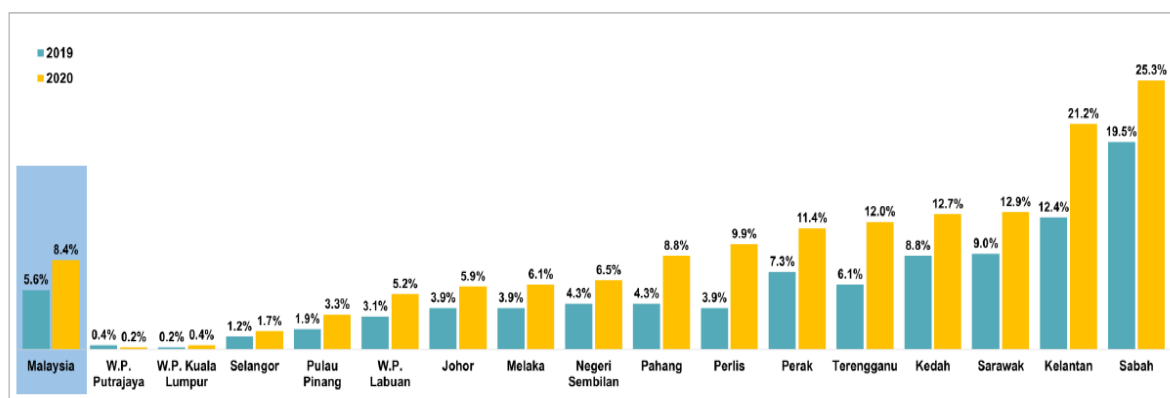
oleh dua lokaliti iaitu Kg. Penimbawan, Tuaran dan Kg. Bongkol, Pitas daripada perspektif agensi pelaksana. Pemilihan kedua-dua lokasi ini bertitik tolak daripada peserta projek IPR-BMT di lokaliti ini telah memulakan projek lebih lima (5) bulan ketika kajian diusahakan. Selain itu, kedua-dua kawasan kajian ini adalah antara lokasi awal yang menerima projek menambah pendapatan ini di negeri Sabah.

## HASIL KAJIAN DAN PERBINCANGAN

Perbincangan hasil kajian ini dibahagikan kepada dua bahagian utama. Bahagian pertama memberi tumpuan terhadap kemiskinan dan latar belakang projek IPR-BMT di Sabah. Bahagian kedua pula menyentuh mengenai isu dan cabaran IPR-BMT di negeri ini dengan fokus kepada dua lokasi iaitu Kg. Penimbawan, Tuaran dan Kg. Bongkol, Pitas.

### Kemiskinan dan Latar Belakang Projek IPR-BMT Di Sabah

Kemiskinan merupakan isu yang penting dan genting di Sabah terutamanya bila dilaporkan sebagai negeri yang mempunyai kadar kemiskinan mutlak tertinggi pada tahun 2019 dan 2020 di Malaysia. Carta 1 menunjukkan Sabah mencatatkan peningkatan insiden kemiskinan mutlak dari 19.5% pada tahun 2019 kepada 25.3% bagi tahun 2020. Rekod turut menunjukkan Sabah menduduki tangga teratas dalam insiden kemiskinan mutlak di Malaysia sejak tahun 1997 (Jabatan Perangkaan Malaysia, 2023). Dalam pada itu, lapan daripada 10 daerah yang disenaraikan sebagai daerah termiskin pada tahun 2019 di Malaysia berada di Sabah (Rancangan Malaysia Ke-12, 2021-2025). Pendapatan Garis Kemiskinan 2019 bagi negeri Sabah adalah RM2,537 (Rancangan Malaysia Ke-12, 2021-2025). Banyak projek pembasmian kemiskinan yang diperkenalkan di Sabah, namun mengapakah insiden kemiskinan masih tinggi? Menerangkan hal ini, Ragayah (2002) menjelaskan kadar kemiskinan tinggi di negeri ini mempunyai kaitan dengan beberapa faktor seperti kekurangan prasarana, kehadiran warga asing dan kesukaran aksesibiliti di kawasan pedalaman Sabah.



**CARTA 1:** Insiden Kemiskinan Mutlak Mengikut Negeri, Malaysia, 2019 dan 2020

Data turut menunjukkan berlaku peningkatan dalam jumlah ketua isi rumah miskin dan miskin tegar di Sabah dalam tahun kebelakangan ini. Sebagai contoh pada tahun 2019, seramai 16,938 ketua isi rumah miskin tegar manakala ketua isi rumah miskin pula 21,373 orang (Unit Penyelarasan Pelaksanaan, 2019) yang direkodkan dalam sistem eKasih. Bagaimanapun seperti yang dipaparkan dalam Jadual 2, angka ini mengalami pertambahan lebih 100% pada tahun 2023 iaitu ketua isi rumah miskin meningkat kepada 48,277 orang. Peningkatan turut ditunjukkan dalam jumlah ketua isi rumah miskin tegar yang menyaksikan berlakunya pertambahan kepada 23,260 orang pada tahun yang sama. Menjelaskan berkenaan hal ini, Pegawai eKasih yang ditemu bual mengatakan:

“Orang sekarang isi eKasih untuk mendapatkan bantuan. Semua berlumba-lumba mahu isi eKasih. Ada kes kami temui yang memalsukan maklumat. Selepas COVID-19, kerajaan mahu bekalkan bantuan dalam bentuk wang ringgit. Ramai yang mohon. Jika tiada COVID-19, mungkin tidak ramai”.

Maka dengan ini, pertambahan bilangan ketua isi rumah miskin dan miskin tegar di negeri ini mempunyai hubungkait dengan persepsi bahawa mendaftar dalam eKasih membolehkan mereka menerima bantuan daripada kerajaan termasuk dari segi kewangan. Kepayahan hidup yang dilalui sepanjang pandemik COVID-19 turut mempengaruhi peningkatan angka ini. Perincian bilangan ketua isi rumah miskin dan miskin tegar mengikut daerah di Sabah ditunjukkan dalam Jadual 2. Sebanyak 11 daerah yang mencatatkan jumlah ketua isi rumah miskin tegar lebih daripada seribu orang. Seperti yang ditunjukkan dalam Jadual 2, daerah Pitas merupakan daerah paling ramai ketua isi rumah miskin tegar iaitu 1,761 (7.6%) orang diikuti Kudat sebanyak 1,735 orang (7.5%). Kedua-dua daerah ini terletak di kawasan utara negeri Sabah. Sebaliknya daerah yang paling sedikit ketua isi rumah miskin tegar adalah Kalabakan yang mencatatkan 70 orang.

**JADUAL 2:** Jumlah Ketua Isi Rumah Miskin dan Miskin Tegar Mengikut Daerah di Sabah, 2023 (Setakat 31 Mei 2023)

Bil.	Daerah	Miskin	Miskin Tegar	Jumlah
1	Beaufort	2,111	793	2,904
2	Beluran	1,710	1,114	2,824
3	Kalabakan	379	70	449
4	Keningau	2,445	1,478	3,923
5	Kinabatangan	1,258	487	1,745
6	Kota Belud	3,194	1,322	4,516
7	Kota Kinabalu	2,408	811	3,219
8.	Kota Marudu	2,972	1,309	4,281
9.	Kuala Penyu	790	368	1,158
10.	Kudat	2,727	1,735	4,462
11.	Kunak	759	324	1,083
12.	Lahad Datu	1,569	935	2,504
13.	Nabawan	1,955	776	2,731
14.	Papar	1,893	676	2,569
15.	Penampang	635	254	889
16.	Pitas	2,725	1,761	4,486
17.	Putatan	396	95	491
18.	Ranau	2,101	1,345	3,446
19.	Sandakan	2,622	1,361	3,983
20.	Semporna	2,490	1,543	4,033
21.	Sipitang	767	221	988
22.	Tambunan	1,027	349	1,376
23.	Tawau	2,900	995	3,895
24.	Telupid	501	268	769
25.	Tenom	1,772	1,118	2,890
26.	Tongod	1,332	661	1,993
27.	Tuaran	2,839	1,091	3,930

<b>Jumlah Keseluruhan</b>	<b>48,277</b>	<b>23,260</b>	<b>71,537</b>
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(Sumber: eKasih, Unit Penyelarasan Pelaksanaan, 2023)

Meskipun berlaku transformasi penting dalam memahami dan mengukur kemiskinan di Malaysia, namun PGK masih menjadi indikator dan kriteria utama dalam menentukan ketua isi rumah yang layak terlibat dalam projek-projek pembasmian kemiskinan. Hal ini kerana PGK masih menjadi satu permulaan yang penting bagi menganalisis kemiskinan (Ragayah, 2007) dan kriteria penting yang digunakan oleh pihak kerajaan di negara ini (Mohamed Saladin et al., 2011; Ragayah, 2007; Ataul Huq et al., 2009; Osman-Rani & Abd. Majid, 1991) menyalurkan bantuan menerusi projek-projek pembasmian kemiskinan kepada golongan miskin (Unit Penyelarasan Pelaksanaan, 2009) termasuklah projek Inisiatif Pendapatan Rakyat.

Projek Inisiatif Pendapatan Rakyat (IPR) bermula dengan pengumuman YB Perdana Menteri ke-9 pada 6 Disember 2021 yang ketika itu dikenali sebagai Basmi Miskin Tegar Keluarga Malaysia (BMTKM). Pada 20 Disember 2022, projek ini ditukar nama kepada Basmi Miskin Tegar (BMT) dan sekali lagi pada 24 Februari 2023 projek ini dinamakan semula dengan penambahbaikan kepada projek sedia ada dengan nama Inisiatif Pendapatan Rakyat (IPR). Di bawah IPR sebanyak empat inisiatif utama untuk membasmi kemiskinan dan menambah pendapatan diperkenalkan menerusi Inisiatif Usahawan Tani (INTAN), Inisiatif Usahawan Makanan (INSAN), Inisiatif Operator Perkhidmatan (IKHSAN) dan Basmi Miskin Tegar (BMT). Pelaksanaan inisiatif ini menurut YAB Perdana Menteri ke-10 bertujuan mengupayakan golongan termiskin bagi meningkatkan pendapatan mereka secara mampan.

Uniknya projek pembasmian yang diterajui Kementerian Ekonomi yang bertindak sebagai penyelaras dan pemudah cara ini julung kalinya melibatkan universiti awam sebagai rakan strategik (Unit Perancang Ekonomi, 2020). Projek IPR ini juga menyaksikan kerjasama dengan pelbagai pihak yang terdiri daripada kementerian dan agensi pelaksana, sektor swasta, syarikat berkaitan kerajaan (GLC), pertubuhan masyarakat sivil (CSO), organisasi berasaskan komuniti (CBO). Kerjasama strategik ini bertujuan memastikan kemampunan pelaksanaan IPR seterusnya mengambil kira dasar pemisah (*exit policy*) kumpulan sasar selepas tempoh dua tahun projek bermula (Unit Perancang Ekonomi, 2020). Satu pendekatan lain yang juga menarik adalah pelantikan pegawai lapangan di setiap lokaliti/daerah. Keberadaan pegawai lapangan dijangka memberi impak positif terhadap pemantauan dan kemampunan projek pembasmian kemiskinan di Malaysia. Kewujudan pegawai lapangan yang memberi tumpuan khusus kepada pelaksanaan dan pemantauan projek di peringkat lokaliti/daerah adalah penting kerana antara isu yang menyumbang kepada kegagalan projek/program sebelum ini adalah kurangnya pemantauan terhadap projek yang diperkenalkan kerajaan (Rosazman et al, 2009).

Penglibatan langsung Universiti Awam (UA) dalam projek IPR-BMT di peringkat akar umbi juga penting dalam memastikan tanggungjawab pembasmian kemiskinan adalah tugas semua pihak termasuk golongan akademik. Sebagai rakan strategik, UA berperanan mengendalikan pemetaan ketua isi rumah miskin tegar, terlibat dalam perbincangan cadangan projek bersama pihak berkuasa tempatan seperti pejabat daerah, melakukan pemantauan dan menganjurkan program berkaitan peningkatan pengetahuan dan kemahiran peserta projek. Dengan kata lain, sumbangan ahli akademik bermula pada tahap awal projek dan tidak hanya menjadi pengkaji yang menilai projek yang telah dilaksanakan.

Perbincangan dalam makalah ini memberi tumpuan terhadap projek IPR-BMT Fasa 1 yang merupakan projek rintis di Sabah. Umumnya projek IPR-BMT menggunakan pendekatan baharu yang menggunakan pendekatan keseluruhan negara (*whole-of-nation approach*), pendekatan bawah-atas (*local problem, local solution*) serta penyelesaian kemiskinan secara bersasar dan bukannya *one size fits all* menerusi tindakan bersepadu di peringkat persekutuan, negeri dan daerah. Pendekatan yang diperkenalkan menerusi pelaksanaan IPR-BMT ini penting kerana setiap negeri dan daerah di Malaysia berada pada tahap pembangunan yang berbeza (Ishak & H. Osman-Rani, 1996). Justeru, setiap lokaliti mempunyai kebebasan menentukan projek yang ingin dilakukan mengikut cadangan Pejabat Daerah selepas sesi perbincangan bersama dengan ketua isi rumah miskin tegar yang terpilih.

Di Sabah, sebanyak 10 lokaliti telah dikenalpasti terlibat dalam projek rintis IPR-BMT dengan keutamaan diberikan kepada daerah yang tersenarai sebagai daerah termiskin di Malaysia (Rancangan Malaysia Ke-12, 2021-2025). Seperti yang ditunjukkan dalam Jadual 3, enam daripada lokaliti IPR-BMT rintis ini merupakan kampung yang berada dalam daerah termiskin di Sabah iaitu Pitas, Tongod, Beluran, Kota Belud, Nabawan dan Kota Marudu. Secara keseluruhannya terdapat seramai 322 orang

ketua isi rumah miskin tegar (KIRMT) yang terlibat dalam projek rintis IPR-BMT di Sabah. Universiti Malaysia Sabah sebagai rakan strategik UA telah melaksanakan pemetaan di kesemua lokaliti bermula 3 November 2022 dan berakhir pada 16 Disember 2022. Daripada keseluruhan KIRMT dalam projek rintis ini, sebanyak 39 (12.1%) KIRMT adalah dari Kg. Bongkol manakala 23 orang (7.1%) lagi dari Kg. Penimbawan.

**JADUAL 3:** Jumlah Peserta Mengikut Lokaliti Projek Rintis IPR-BMT di Negeri Sabah (Fasa 1)

Lokaliti	Daerah	Bilangan Peserta (%)
1. Kg. Bongkol	Pitas	39 (12.1%)
2. Kg. Pinangah	Tongod	42 (13.0%)
3. Kg. Sembirai	Kota Belud	36 (11.2%)
4. Kg. Tetabuan	Beluran	19 (5.9%)
5. Kg. Lima	Nabawan	38 (11.8%)
6. Kg. Tandek	Kota Marudu	22 (6.8%)
7. Kg. Kaingaran	Ranau	35 (10.9%)
8. Kg. Pelakat	Sipitang	24 (7.5%)
9. Kg. Binsulok	Membakut	44 (13.7%)
10. Kg. Penimbawan	Tuaran	23 (7.1%)
<b>Jumlah Keseluruhan</b>		<b>322 (100.0%)</b>

(Sumber: Sistem iBox, 2022)

Secara keseluruhannya terdapat sebanyak tiga projek yang disertai oleh peserta IPR-BMT dari Kg. Penimbawan, Tuaran dan lapan projek di Kg. Bongkol, Pitas. Bagaimanapun, bagi maksud perbincangan dalam kajian ini, fokus diberikan kepada tiga projek di Kg. Bongkol yang melibatkan Projek Perkhidmatan Penghantaran Barang (9 peserta); Projek Penjualan Sayur (3 peserta); dan Projek Penjualan Ayam Standard (6 peserta). Manakala satu projek di Kg. Penimbawan iaitu Projek Peralatan Menangkap Ikan (13 peserta). Kesemua projek IPR-BMT ini bersifat *one-off*. Memandangkan peserta projek ini semuanya merupakan ketua isi rumah miskin tegar, maka projek pembasmian kemiskinan ini menyediakan pakej lengkap termasuk tapak perniagaan, modal, peralatan dan latihan/kursus berkaitan projek yang disertai kepada semua peserta projek. Misalnya peserta Projek Perkhidmatan Penghantaran Barang di Kg. Bongkol menerima motosikal, kos mendapatkan lesen ditanggung kerajaan, *luggage box* dan telefon bimbit serta disediakan kursus tatacara penggunaan Halo Delivery oleh Pengurus Cawangan Halo Delivery. Dengan kata lain, peserta IPR-BMT hanya perlu memulakan projek yang diberikan kepada mereka tanpa perlu merisaukan tentang sebarang kos permulaan projek.

### Isu dan Cabaran IPR-BMT di Sabah: Satu Penilaian Awal

Kajian ini mendapati isu dan cabaran dalam pelaksanaan IPR-BMT di Sabah berlaku di pelbagai peringkat dan melibatkan peserta dan pemegang taruh. Kajian dalam kalangan peserta IPR-BMT di dua lokaliti mendapati wujud dua kelompok peserta yang dibezakan berdasarkan komitmen terhadap projek. Pertama, peserta yang secara aktif menjalankan projek manakala kedua, peserta pasif yang menangguhkan pelaksanaan projek IPR-BMT. Peserta aktif ditakrifkan sebagai peserta yang melibatkan diri dalam projek seurus selepas pengagihan projek berlaku. Manakala peserta pasif pula terdiri daripada peserta yang lewat memulakan projek atau peserta yang sehingga kajian ini dijalankan masih belum memulakan projek. Perbincangan dalam bahagian ini mengupas isu dan cabaran dalam pelaksanaan IPR-BMT daripada perspektif agensi pelaksana di dua lokaliti iaitu Kg. Penimbawan, Tuaran dan Kg. Bongkol, Pitas.

## **Memupuk Budaya Kemiskinan**

Faktor budaya telah lama diperkatakan sebagai satu penyebab penting yang mengukuhkan elemen negatif kehidupan orang miskin. Oscar Lewis yang merupakan pengkaji awal mengemukakan wujudnya pengaruh budaya dalam memahami fenomena kemiskinan. Sifat, tingkah laku dan amalan yang dimiliki oleh orang miskin termasuklah berputus asa, bersikap acuh tidak acuh dan berserah pada takdir menyebabkan mereka kekal hidup dalam kemiskinan (Lewis, 2010). Meskipun perspektif budaya dalam memahami kemiskinan dikritik di peringkat global, namun dalam konteks Malaysia, isu kemiskinan masih mempunyai hubungkait rapat dengan budaya (Asnarulkhadi, 2010; Chamhuri, 2004). Kajian di dua lokaliti ini menunjukkan ada peserta yang masih belum pun memulakan projek masing-masing meskipun selepas hampir sebulan peralatan diserahkan kepada peserta. Malah seorang peserta masih belum mengeluarkan enjin sangkut daripada kotak. Hal ini ditemui ketika penyelidik membuat pemetaan di Kg. Penimbawan. Bila ditanya, peserta menggunakan faktor cuaca tidak menentu sebagai sebab belum turun ke laut walhal peserta lain sudah menggunakan peralatan menangkap ikan yang sama sehari selepas peralatan diserahkan kepada mereka.

Penemuan serupa turut berlaku dalam kalangan peserta Projek Perkhidmatan Penghantaran Barang di Kg. Bongkol, Pitas. Kajian mendapati seramai tiga orang peserta yang telah menerima pakej lengkap projek sejak Disember 2022 masih belum memulakan perkhidmatan penghantaran barang. Menurut pegawai lapangan, peserta dinasihatkan untuk melakukan sekurang-kurangnya satu perkhidmatan seminggu, namun mereka enggan berbuat demikian. Mengulas tentang isu ini, pegawai lapangan mengatakan motosikal digunakan oleh peserta untuk melakukan pekerjaan tetap mereka sebagai penoreh getah. Sikap dan komitmen peserta menjadi salah satu faktor penentu penting dalam kejayaan projek pembasmian kemiskinan. Keazaman dan kesungguhan peserta mempengaruhi kesanggupan mereka untuk berhadapan sebarang bentuk cabaran yang timbul sepanjang melaksanakan projek. Sikap bertanggung dalam memulakan projek adalah amat dikesalkan dan merugikan kerana kerajaan telah membelanjakan sejumlah wang untuk setiap projek. Untuk itu, menjadi tanggungjawab peserta berusaha menjana pendapatan tambahan daripada projek yang diikuti seperti yang disebut dalam borang akujanji projek. Sikap bertanggung dan keengganan memulakan projek tanpa alasan munasabah patut dielak. Apa yang berlaku ini merupakan kemiskinan sikap (Asnarulkhadi, 2010) yang menuntut perubahan sikap positif (Chamhuri, 2004).

## **Fokus dan Mengutamakan Pekerjaan Sedia Ada**

Memandangkan projek yang disertai berbeza dengan kelaziman aktiviti ekonomi peserta, maka mereka cenderung mengutamakan pekerjaan utama masing-masing. Perkara ini ditemui dalam kalangan peserta Projek Perkhidmatan Penghantaran Barang di Kg. Bongkol. Kesemua peserta ini menggunakan motosikal IPR-BMT untuk mengambil upah menoreh getah dan kelapa sawit. Kesannya, tidak ada pendapatan direkod bagi projek yang disertai sejak ia diserahkan kepada peserta. Menurut informan yang merupakan pegawai lapangan:

“Ya, menjejaskan pendapatan daripada projek BMT tapi diorang (mereka) dapat pendapatan dari kerja diorang. Macam peserta COD, ada yang ambil upah menoreh getah dan sawit. Peserta ni tiada masa COD. Kebanyakan peserta ada kerja lain selain projek BMT, jadi mereka tidak dapat fokus kepada BMT sahaja.”

Walaupun begitu, penggunaan motosikal telah memudahkan pergerakan peserta melakukan pekerjaan utama. Hal ini kerana sebelum terlibat dalam projek ini, ada yang tidak memiliki kenderaan sendiri dan terpaksa menumpang kenderaan penduduk kampung untuk mengambil upah menoreh di kebun getah atau kelapa sawit. Jelasnya, projek ini telah memberi nilai tambah dari segi pemilikan harta peserta dan memberi kemudahan pengangkutan ke tempat kerja meskipun ia bertentangan dengan matlamat projek.

## **Kurang Komitmen Peserta Terhadap Projek IPR-BMT**

Kesungguhan, komitmen dan minat merupakan elemen penting bagi memastikan cabaran yang timbul sepanjang terlibat dalam boleh diatasi. Kajian lepas menunjukkan tiga sifat ini berupaya mengeluarkan

peserta daripada masalah yang dihadapi dalam projek. Selain itu, ia membantu peserta meneroka peluang-peluang baharu demi memastikan kelangsungan projek yang disertai (Jalilah, Diana Demiyah & Rohana, 2021). Bagaimanapun, data yang diperolehi daripada informan mendapati sebilangan besar peserta Projek Perkhidmatan Penghantaran Barang yang kurang komited dan kurang berminat melaksanakan projek. Menurut informan:

“Kami ada buat jadual, sekurangnya kalau sibuk sangat, dalam seminggu, sekali buat COD. Tapi macam susah diorang (mereka) ikut, mereka tidak memberi kerjasama.”

### **Penggunaan Peralatan Projek untuk Penjanaan Pendapatan Baharu**

Penggunaan peralatan projek untuk tujuan menjana pendapatan baharu ditemui berlaku dalam IPR-BMT fasa rintis ini. ‘Penyalahgunaan peralatan’ untuk aktiviti ekonomi baharu ini ditemui ada berlaku dalam kalangan peserta Projek Peralatan Nelayan di Kg. Penimbawan, Tuaran. Kajian ini mendapati bot dan enjin digunakan sebagai pengangkutan air dan berjaya menyumbang pendapatan mencecah RM300 sehari. Menurut pegawai lapangan yang ditemui bual, aktiviti mengangkut penumpang dilakukan ketika peserta tidak turun ke laut. Hal ini disahkan menerusi laporan pendapatan yang diberikan kepada pegawai lapangan yang menunjukkan dalam tempoh seminggu, peserta ada turun ke laut dan turut melakukan ‘grab air’ di sekitar perkampungan Penimbawan ke Jeti Serusup. Kombinasi dua aktiviti ekonomi daripada penggunaan peralatan bot dan enjin ini memberi pendapatan tambahan kepada sumber ekonomi utama sebagai nelayan. Meskipun begitu, wujud juga khabar angin yang mengatakan ada peserta yang menjual peralatan projek, namun kesahihan maklumat ini belum dapat dipastikan lagi.

### **Isu dan Cabaran Agensi Pelaksana**

Kajian ini menemukan tiga isu dan cabaran yang dihadapi oleh agensi pelaksana dalam projek IPR-BMT di dua lokaliti yang diselidiki. Isu berkait peranan pegawai lapangan, bekalan barang jualan dan kemampuan projek IPR-BMT merupakan cabaran yang juga memerlukan perhatian serius kerajaan bagi memastikan kelancaran dan kejayaan projek ini pada masa hadapan.

### **PEGAWAI LAPANGAN**

Pendekatan penting dalam Projek IPR yang baharu diperkenalkan ini adalah pelantikan pegawai lapangan yang berperanan membantu menyelaras dan memantau projek serta melakukan sesi libat urus di lokaliti yang ditetapkan. Dengan kata lain, pegawai lapangan adalah pegawai perhubungan di antara Pejabat Daerah-Kementerian Ekonomi-Peserta IPR dan merupakan individu yang mengetahui setiap aspek berkaitan projek IPR yang wujud di satu-satu lokaliti/daerah. Menyedari bahawa Projek IPR-BMT masih di peringkat awal pelaksanaannya, namun, kajian ini mendapati wujud kecenderungan peserta yang kurang patuh kepada arahan yang diberikan oleh pegawai lapangan. Buktinya, ada dalam kalangan peserta belum memulakan projek meskipun telah diminta berbuat demikian oleh pegawai lapangan. Kehadiran pegawai lapangan diharapkan boleh membawa perubahan penting dalam pemantauan projek dan mencapai matlamat membasmi miskin tegar. Namun, pegawai lapangan yang sebahagian besarnya merupakan graduan baharu yang juga masih kurang pengalaman dalam pasaran kerja. Hal ini menyebabkan wujud cabaran berhadapan peserta IPR-BMT yang sebahagian besarnya lebih berusia. Keadaan ini dinyatakan oleh salah seorang pegawai lapangan seperti berikut:

“Kadang-kadang susah juga sebab kita ni muda kan, jadi mereka (peserta projek) ni tidak takut.”

Pemerhatian penyelidik ketika melaksanakan pemetaan mendapati pegawai lapangan mempunyai pengetahuan dan kecekapan yang berbeza-beza. Sebahagian besar pegawai lapangan yang dilantik merupakan individu yang komited dan bersungguh-sungguh dalam tugas mereka. Namun, rata-rata mereka ini kurang kemahiran untuk mendekati peserta dan ketika berhadapan isu-isu berbangkit di

peringkat lokaliti. Justeru itu, latihan untuk meningkatkan kemahiran pegawai lapangan perlu diadakan bagi melahirkan kumpulan pegawai lapangan yang terlatih.

### **Bekalan Barang Jualan tidak Mencukupi**

Pembekalan produk untuk dijual oleh peserta merupakan antara peranan rakan agensi dalam Projek IPR-BMT. Selain membantu dari segi menyalurkan bekalan, agensi turut berperanan memberi khidmat nasihat, bimbingan dan memudahcara pemasaran produk yang dihasilkan peserta. Dalam kes Projek Penjualan Ayam Standard di Kg. Bongkol, Pitas, rakan agensi adalah Koperasi Pembangunan Desa (KPD). Agensi ini menjual ayam pada harga yang lebih murah kepada peserta agar keuntungan boleh diperolehi daripada jualan ayam tersebut. Bagaimanapun, kajian ini mendapati peserta berhadapan dengan bekalan ayam yang tidak konsisten dan ini menyebabkan peserta mendapatkan stok ayam dari tempat lain. Isu ini diuraikan oleh pegawai seperti berikut:

*“Supply ayam tidak konsisten dari KPD. Jadi peserta ambil stok dari tempat lain, terpaksa jual mahal. Bila ada stok dari KPD jual murah lagi. Pelanggan pandai bingung lama-lama sebab kejap-kejap tukar harga.”*

Situasi ini memberi kesan terhadap keuntungan yang diperolehi peserta kerana bekalan ayam dibeli pada harga yang lebih mahal. Misalnya, peserta membeli dada/paha ayam pada harga RM22.00 sebungkus daripada KPD dan menjual semula kepada penduduk Kg. Bongkol RM27.00 sebungkus. Keuntungan daripada setiap bungkus jualan ini adalah RM5, bagaimanapun jika stok jualan diperolehi dari tempat lain, margin keuntungan lebih kecil. Cabaran dari segi memperoleh keuntungan kesan daripada terputusnya stok ayam daripada agensi dijelaskan informan di bawah:

*“Kalau dapat bekalan daripada KPD peserta jual RM27 sekilo, untung RM5. Kalau ambil stok dari tempat lain, mahal kadang untung diorang ambil dalam RM1 sahaja bagi setiap kilo.”*

### **Kemampuan Projek Tanpa Pemantauan Agensi**

Kebolehan projek pembasmian kemiskinan untuk bergerak sendiri tanpa pemantauan agensi pelaksana adalah cabaran yang sudah mula ditunjukkan dalam kalangan peserta projek IPR-BMT di Kg. Penimbawan dan Kg. Bongkol. Kekhawatiran berkait kemampuan projek menjadi isu genting dalam semua jenis program pembangunan termasuklah program pembasmian kemiskinan. Keupayaan projek pembangunan untuk bertahan dan bergerak secara mandiri oleh peserta kerap didebatkan dalam kajian pembangunan (Jalilah, Diana Demiyah & Rohana, 2021; Abdul Rasid & Mohamad Zaid, 2014). Hujahnya, komuniti atau peserta tidak berupaya untuk meneruskan projek pasca pemantauan kerana tidak ada keupayaan dari segi kewangan, mendapatkan bekalan dan memasarkan barang/produk secara mandiri. Motivasi dan komitmen peserta juga ada pasang surut yang boleh memperlahankan fokus dan penglibatan mereka dalam projek yang diikuti.

## **PENUTUP**

Ketua isi rumah miskin tegar yang terlibat dalam projek IPR-BMT ini terdiri daripada individu yang mewarisi kehidupan miskin daripada keluarga masing-masing. Untuk itu, bagi mengeluarkan kumpulan ini daripada kemiskinan memerlukan pendekatan yang holistik termasuk membangunkan kapasiti mereka sebagai peserta projek. Nilai-nilai baik seperti rajin, bersungguh-sungguh, komited dan berdaya saing perlu dipupuk dan ditanam daripada awal projek. Kesemua nilai ini boleh melahirkan peserta yang menghargai pemberian kerajaan yang boleh mempengaruhi peningkatan pendapatan isi rumah masing-masing sekaligus keluar daripada miskin tegar. Kehadiran pegawai lapangan yang dilantik secara khusus bagi mengurus dan mentadbir projek IPR dilihat berupaya membimbing, memantau dan seterusnya meningkatkan penglibatan peserta dalam projek IPR-BMT. Sesungguhnya, isu dan cabaran yang dihadapi peserta, pegawai lapangan dan rakan agensi seawal pelaksanaan projek IPR-BMT ini

perlu diberi perhatian oleh agensi pelaksana. Hal ini penting bagi memastikan isu yang boleh menyekat kejayaan dan keberterusan projek ini diatasi dari awal lagi. Sikap dan komitmen peserta jika tidak ditangani dengan bijak dan berhati-hati boleh menyebabkan pelaburan kerajaan menerusi usaha pembasmian kemiskinan khususnya miskin tegar di Malaysia akan menemui kegagalan.

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# MALAYSIA'S RAINFOREST BIODIVERSITY A SUSTAINABLE GREEN INVESTMENT

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## ABSTRACT

### INTRODUCTION

The Covid-19 global pandemic (“**the pandemic**”) has a profound impact on the world, forcing us to rethink our traditional approaches. Malaysia’s economic state is further affected as we have been experiencing mega revenue crisis even before the pandemic due to the erratic fluctuation of our commodities like petroleum and palm oil. A huge paradigm shift is necessary to overcome the over reliance on petroleum and palm oil as Malaysia’s mega revenue generator.

### THE POWER OF NEGLECTED ASSETS

Malaysia possesses diverse and valuable natural resources. Traditionally, we have neglected assets with tremendous commercial potentials to generate mega revenues for Malaysia. One of the neglected assets is the Malaysian rainforest, which is rich in biodiversity and bio-active compounds (“**compounds**”). Extensive research by institutions like Forest Research Institute of Malaysia (“**FRIM**”) has revealed the therapeutic potential of these compounds in combating diseases. We can tap into the economic potential of these compounds by commercialising them into pharmaceutical products.

However, the commercialisation of these compounds faces major hurdle due to the exorbitant capital requirement for drug development. To address the capital challenge, the Malaysian government should collaborate with global investors and sovereign funds through a special purpose vehicle, the Global Rainforest Biotechnology

Gateway (“**GRBG**”). The GRBG will serve as an intellectual property bank, housing world’s rainforest intellectual properties, and spearhead the preclinical and clinical trial activities of the compounds, thus fostering the Malaysian drug development industry.

In conclusions, Malaysia must embrace unconventional strategies to navigate the economic challenges brought by the pandemic. By leveraging the Malaysian rainforest, the country can unlock new mega revenue streams beyond petroleum and palm oil, propel its drug development industry and position itself as a leader in the global rainforest economy. The GRBG will also revolutionise global disease treatment, making it a vital national strategic asset.

Keywords: mega revenue generator; neglected asset; pharmaceutical products; intellectual properties; global disease treatment

## ABSTRAK

### PENGALAN

Wabak Covid-19 (“**pandemik**”) telah memberikan impak mendalam kepada dunia, memaksa kita untuk memikirkan semula pendekatan tradisional kita. Keadaan ekonomi Malaysia terjejas lebih teruk krisis penjana pendapatan utama negara sebelum pandemik disebabkan oleh harga pasaran komoditi seperti petroleum dan minyak sawit yang tidak menentu. Anjakan paradigma yang besar diperlukan untuk mengatasi kebergantungan melampau terhadap petroleum dan minyak sawit sebagai penjana hasil utama Malaysia.

## KEKUATAN ASET TERABAI

Malaysia memiliki pelbagai sumber alam semula jadi yang berharga. Secara tradisinya, negara kita telah mengabaikan asset-aset dengan pontensi nilai komersil besar yang boleh menjana pendapatan utama untuk Malaysia. Hutan hujan Malaysia yang kaya dengan biodiversiti dan kompaun bio-aktif (“**kompaun**”) merupakan antara asset yang diabaikan. Penyelidikan meluas oleh pelbagai institusi seperti Institut Penyelidikan Perhutanan Malaysia (“**FRIM**”) telah mengungkap pelbagai potensi terapeutik kompaun-kompaun ini dalam memerangi penyakit. Pelbagai potensi ekonomi boleh dimanfaatkan melalui pemasaran kompaun-kompaun ini sebagai produk farmaseutikal.

Walau bagaimanapun, pengkomersilan kompaun-kompaun ini menghadapi rintangan keperluan modal yang terlalu tinggi untuk proses pembangunan ubat. Oleh itu, kerajaan Malaysia harus bekerjasama dengan pelabur global dan dana kekayaan berdaulat (*‘sovereign funds’*) melalui entiti bertujuan khas yang dikenali sebagai Gerbang Bioteknologi Hutan Hujan Global (“**GRBG**”). GRBG akan berfungsi sebagai bank harta intelek hutan hujan dunia, dan menerajui aktiviti ujian praklinikal dan klinikal kompaun, sekali gus memajukan industri pembangunan ubat Malaysia.

Malaysia perlu menyokong sepenuhnya strategi-strategi bukan konvensional untuk mengharungi cabaran ekonomi. Dengan memanfaatkan hutan hujan negara, Malaysia dapat menjana saluran pendapatan baharu yang melangkaui petroleum dan minyak sawit, memacu industri pembangunan ubat dan menempatkan Malaysia sebagai peneraju dalam ekonomi hutan hujan global. GRBG juga akan merevolusikan rawatan penyakit di dunia, menjadikannya aset strategik nasional yang penting.

Kata kunci: penjana hasil utama; asset terabai; produk farmaseutikal; harta intelek; rawatan penyakit dunia

## INTRODUCTION

Petroleum and palm oil have been the pillar of the Malaysian economy for the last thirty (30) years. Based on the Reserves Life Index calculation, our nation’s petroleum reserves for oil and gas resources are projected to last for only fifteen (15) years but can be stretched to over forty (40) years with huge technology capital investment for optimal resources utilisation (Daim Nuradzimmah, 2023). Meanwhile, our palm oil has been facing consistent attacks and the latest resistance comes from the European Union’s (“**EU**”) import banning of Asian palm oil (Reuters 2023). This will further increase the stiff import rivalry between the Asian palm oil producers, including Malaysia, fighting over the now “smaller” palm oil market size. Hence, Malaysia’s high reliance on these commodities is no longer sustainable.

The Covid-19 global pandemic (“**the pandemic**”), coupled with the erratic fluctuation of our major commodities, petroleum and palm oil, has further aggravated our economic state. The pandemic’s profound impact on the global economy has forced us to rethink our traditional approaches. The struggle in generating sustainable mega revenue generators to the nation is a national crisis that requires immediate attention and solutions. Moving beyond petroleum and palm oil is no longer a myth but a journey Malaysia must embark on. A huge paradigm shift is necessary to overcome the over reliance on petroleum and palm oil as Malaysia’s mega revenue generators.

The main question is what choices do we have? The nation has just embraced changes in its political scenario. The people of Malaysia have decided that a new leadership is necessary to lead the country into a new era. We have created the new Malaysia. This may also be the appropriate signal for Malaysia to undertake a new economic agenda in order to survive the onslaught of globalisation. We are at a crossroad between sacrificing our traditional economic attitude or joining those countries (Jiyeong 2023) which are experiencing bailouts by the International Monetary Funds (“**IMF**”) or the World Bank. We could see various social unrest in these insolvent countries due to the stringent conditions imposed by the IMF or World Bank.

With the same exuberant spirit of change, we, as a nation, must embark on a new economic journey. The realisation of how catastrophic it can be from over relying on petroleum and palm oil as

Malaysia's main source of revenues is not to be taken lightly. Hence, a new approach has to be designed to generate new revenue streams. It is imperative that we embrace change and paradigm shift. But it doesn't necessarily have to be an arduous journey. If we can intelligently work our way out, the new Malaysia will emerge victoriously. The quest for the new Malaysian economic dynamics have just begun. Together, we will break new frontiers and once again be seen as a respectable and reputable nation to the world.

## **LITERATURE REVIEW**

The paper discusses the need for Malaysia to diversify its economic revenue stream beyond petroleum and palm oil, which have been the mainstay of the country's economy for several decades. The authors highlight the challenges faced by Malaysia, such as the limited lifespan of petroleum reserves and the European Union's ban on Asian palm oil imports. They argue that Malaysia must undertake a paradigm shift to overcome its overreliance on these commodities and find new sources of revenue.

The authors propose that Malaysia should tap into its neglected asset, the Malaysian rainforest, which is rich in biodiversity and bioactive compounds. They emphasize the therapeutic potential of these compounds in combating various diseases, including degenerative diseases. However, they note that the economic potential of these compounds has not been fully exploited, and the country's national parks are primarily serving as tourist attractions.

## **THE POWER OF NEGLECTED ASSETS**

Malaysia possesses diverse and valuable natural resources. One of the neglected assets is the Malaysian rainforest, which is rich in biodiversity. The Taman Negara and Endau Rompin National Park are more than 130 million and 250 million years old respectively. The Taman Negara itself is home to over 3,000 species of plants. Extensive research by institutions like Forest Research Institute of Malaysia ("FRIM") has revealed the therapeutic potential of bioactive compounds from Malaysia's rainforest plants in combating various diseases including degenerative diseases.

Our biodiversity is a rich treasure of knowledge with huge potential to generate mega revenue streams for the country (Malaysia National Biodiversity Policy 1998). Unfortunately, the economic potential of these bioactive compounds are not being exploited to their full potential and our national parks are merely serving as tourist attractions. The fear of losing and destroying our flora and fauna has put a halt in tapping the commercial viability of our biodiversity to its full potential. However, we as a nation must be committed in our search for alternative primary sources of revenue. While preserving our biodiversity, we must concurrently harness its benefits.

Since the beginning of the new millennium, Malaysia has focused its attention to biotechnology as the new engine of economic growth. In America, the same biotech drive has resulted in the "Biotech Boom" in the 1980s and they are certainly far ahead of us in terms of sophistication. Biotechnology requires a paradigm shift in Malaysia as we need to believe in the value of investing in research and development as well as the commercial viability of our findings. Without this overwhelming belief, Malaysia is expected to experience difficulties in propelling its biotechnology drive.

The paradigm shift does not revolve just around our biodiversity but also involves our human capital and other resources. A dynamic integration between our existing resources is crucial to make this agenda a success. In order to compete globally, Malaysia must thoroughly identify its strength and intelligently capitalise these assets to propel its biotechnology agenda. In global biotechnology, the major focus is on human capital to deliver new tools and techniques in developing new solutions. Malaysia is not short of scientific talents and in the spirit of "Malaysia Boleh" we must believe that our scientists will deliver.

## **MALAYSIAN BIOTECHNOLOGY: IDENTIFYING OUR NICHE STRATEGIES**

Our neighbouring country, Singapore, has been pushing its biotechnology drive to the limit ever since the early 2000s. They have created one of the world's best biotechnology zone called Biopolis with a massive budget of over SGD7 billion as of 2015 (Jean Claude Muller, 2016). Further to this, Singapore is also spending on luring over some of the best biotechnology brains. World's best scientists are now flocking to Singapore to enjoy massive research funding. Biopolis is meant to be a global biotech centre. Imagine a nation with little natural resources is willing to spend billions of dollars on biotechnology. This clearly demonstrates the high commercial value biotechnology has in driving a nation's economy.

However, after spending their wealth on biotechnology, a report from the World Bank in late 2006 concluded Singapore had only a fifty percent (50%) chance of succeeding as a biotechnology research hub due to lack of entrepreneurial culture, weak links between universities and business and Singapore's dependence on a "footloose group" of top scientists who could leave at short notice. Despite this, Singapore is now in its Phase 6 of Biopolis, meeting the demand of biotechnology start-ups and adding another 35,000 square metres area to support research activities. This indicates that turning biotechnology into a major economic driver is not an easy journey but feasible. It requires full commitment from all parties and efficient resource management on top of huge capital investment.

Malaysia, a country rich in biodiversity, is left far behind than Singapore who were once a part of us and has little natural resources. This may be attributed to poor management of our research works and commercialisation agenda. However, it is not an impossible journey to turn around and be an Asian power economic hub, housing world's best biotechnologies. Working as a nation, Malaysia can turn a once less important economic resource into a star revenue generator for our country. What counts are the results and we have to be very practical in trying to achieve our dreams. Finding our niche strategies is essential in making biotechnology into a mega revenue generator for the nation.

Malaysia's National Biotechnology Policy focuses on three (3) core areas, agriculture, healthcare and industrial. However, the policy seems to emphasise more on agriculture food security with fewer mentions of healthcare biotechnology. Somehow drug discovery and development has been marginalised which may be attributed to the taboo of huge capital injection and the inferior colonised mindset that we can never compete with the global giants of drug industry. We do not need to compete head on with the established drug giant but focus on delivering results with the resources we have by designing intelligent and efficient approaches. Even though the drug development business is complex, it is still the most lucrative of all the biotechnology sectors.

Malaysia has to be innovative in tapping into the economic benefits of global disease treatment that drives the drug development industry. We may not have sophisticated technologies such as bioinformatics or drug synthesis, but those are mere tools not the result. We must focus on the outcome. In disease treatment, what matters most is the ability to conjure up the solution with capacity to cure the disease. When Singapore decided to embark on their Biopolis, they knew that they were creating the means to achieve results. They were basically groping in the dark without specific focus. Thanks to Singapore's adaptive mindset, their Biopolis is still going strong even after 20 years of venturing into it.

The question for Malaysia is how do we determine our niche focus? Do we have any promising leads? The answer is yes. We are actually sitting on a pot of gold but only if we understand how to capitalise it. Our answer lies within the knowledge of our very own asset, the Malaysian rainforest. Through many generations, knowledge of the rainforest was transferred from the aborigines to our ancestors. The Malaysian rainforest is obviously a huge treasure of disease treatment which has become the envy of other nations. Quoting the Head of

Advance Institute of Medical and Dental Research USM, "It is estimated that 80% of the world's natural health bio active compounds can be found in Peninsular Malaysia and Borneo" (M. Amzad Hossain 2011). With such a huge asset, Malaysia can jump start the drug development process.

Developing drugs means there are prevailing drug industry procedures we need to adhere to. Issues like the need for sophisticated technology, research patents and clinical trials are all leading to the same obstacle, the huge capital requirement to develop a single drug. This is how the Western world controls the global drug industry by discouraging small nations like Malaysia with high barrier to entry. To neglect our national treasures just because of this seems absurd as we have the other resources

required for drug development. Our bright minds and talents are capable and at par with the world's best talents while our abundant natural resources are there ready for us.

There are several issues that Malaysia needs to thoroughly address in order to embark on this new economic journey. Among them is the lack of interest but more importantly lack of believe in investing into knowledge. This is the largest hindrance as investors failed to see the huge potential commercial values of research programmes, which leads to the lack of symbiotic relationship between Malaysian scientific community and private sectors. There is also an issue of the objective of research work is only for academic purposes without realising that the research findings can be commercialised and turned into an economic driver for the country.

A leap of faith and a huge change in mindset from all parties are crucial to facilitate the success of Malaysia's biotechnology programme. We must believe that we can change the status quo. We must have the desire to change the landscape of the global biotechnology industry. Without all this, the Malaysian biotechnology drive will remain a half-baked effort to survive in the search of a new economy by tapping into the economic potential of these compounds by commercialising them into pharmaceutical products. Together we must break new frontiers.

## **SEIZING OPPORTUNITIES FROM THE GLOBAL DRUG FIASCO**

The global drug industry is facing various lashbacks and crises. There are four (4) main issues surrounding the global drug industry. The first one is the recalls of numerous drugs from the global market due to serious chemical side effects, like the recent recall of an anxiety drug, Xanax (Jolynn Tumolo 2023). Second is the emergence of numerous degenerative diseases without cure like arthritis and Alzheimer's disease. Third is the expiry of drug patents, leading to production of cheaper generic drugs like paracetamol, which resulted in increased competition and may significantly erode revenue. The last one is numerous cases of scientists faking the research results which consequently putting the integrity of the approving authorities like the United States Food and Drug Authorities ("U.S. FDA") in question.

How can Malaysia, a small developing country in South East Asia seize the opportunities? The above issues mainly surround the harmful side effects of synthetic drugs developed by the pharmaceutical industry players and imposed tremendous pressure on drug giants. Numerous mergers and acquisitions ("M&As") in the global pharmaceutical industry are taking place to maintain market share and competitiveness. One recent example is the acquisition of Prometheus Biosciences for its bowel disease candidate by Merck & Co. worth USD10.8 billion (Annalee Armstrong 2023). This is a positive signal for Malaysia as we can leverage on the abundant safe and natural bioactive compounds of our rainforest and consequently attract the interest of big pharma giants in investing or collaborating with Malaysia.

Malaysia can also seize the momentum of MicroRNAs which are gaining popularity in the pharmaceutical industry especially after the microRNAs-based Covid-19 vaccine produced by AstraZeneca. MicroRNAs are mostly used in the development of therapeutic agents to various diseases such as degenerative diseases, metabolic diseases, pain management, immunology, cardiology and virology. This indicates huge opportunities for Malaysian rainforest bioactive compounds. While the global pharmaceutical corporations are focusing on developing synthetic microRNAs, Malaysia can champion the natural or plant-based microRNAs as they are expected to be human-friendly, without lethal side effects as compared to the synthetic ones.

On top of the above, the global population is now in search for safe and natural treatment alternatives due to the increased awareness of the adverse and life-threatening side effects of synthetic drugs. China's Traditional Chinese Medicine ("TCM") is the perfect example of how alternative medicine can significantly contribute to a nation's economic growth. The volume of TCM commodity in China reached a total of USD 6.174 billion in 2019. TCM has become the key driver of sustained development of China's health economy. The pandemic has also attracted unprecedented attention on TCM from the world due to products' efficacy and many TCM products included as treatments for the pandemic by China showed satisfactory clinical effect in China (Liyao Xiang 2022).

Malaysia can also benefit from the knowledge passed down by our ancestors on the applications of our traditional medicine that comes from our own biodiversity. Certain indigenous plants, animals

and their derivatives have long been used to treat diseases in Malaysia. For example, roots of "*tongkat ali*" (*Eurycoma longifolia*) contain bioactive compounds with the potential to be developed as antimalarial drug. Many plants, not presently used in traditional medicine, also contain bioactive compounds that are likely to be the starting materials for a large number of drugs. The crude extract of the bark of "*bintangor*" (*Calophyllum lanigerum*) contains the active component against the HIV virus.

The passed down knowledge supported with scientific findings can be a powerful tool in aiding the commercialisation of our bioactive compounds. Therefore, there is a need for the nation, endowed with rich biological diversity and steeped in a traditional healing culture, to develop the economic potential of the medicinally useful plants. Nearly one quarter of medicines prescribed in the United States of America are of plant origin, for example, and the market for plant-derived pharmaceuticals is estimated at USD 9 billion per year in the United States alone. In the OECD (Organisation for Economic Cooperation and Development) countries, the total retail value of plant-based drugs was USD43 billion in 1986. Hence, not exploiting our rich rainforest biodiversity is a waste.

## METHODOLOGY

### External Sources of information

To assist in our analysis and building a frame of the value of the Neglected Asset , we reached out a variety of other sources of information to help us with our study and establishing a framework for the worth of the Neglected Asset. Many of these sources are freely accessible to the public, while others are restricted. Some of these sources is in the list of reference.

### Internal Sources of information

We have depended on our partner in Seoul, Korea, Naerok Resources Pty Ltd, as our key internal sources of information. We have provided our partner with Malaysia modified coconut oil, also known as cultured coconut extract (CCE), for further research. It is now known as SUPER C3 and is patented. Our team consists of the following individuals:

#### **Research Director : OK MIN**

Dong-A University (2004) Ph.D. in Biotechnology  
Study on derived functional materials  
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Guest Professor, Jiangsu University of Science and Technology, China  
Professor, Department of Applied Life Science, Dong-A University

#### **Kim Kyung Sook**

University of Tokyo, Japan  
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#### **Cho Jong Hyun**

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Emory University, School of Medicine, Instructor as a Faculty

#### **Huh Jae Bok**

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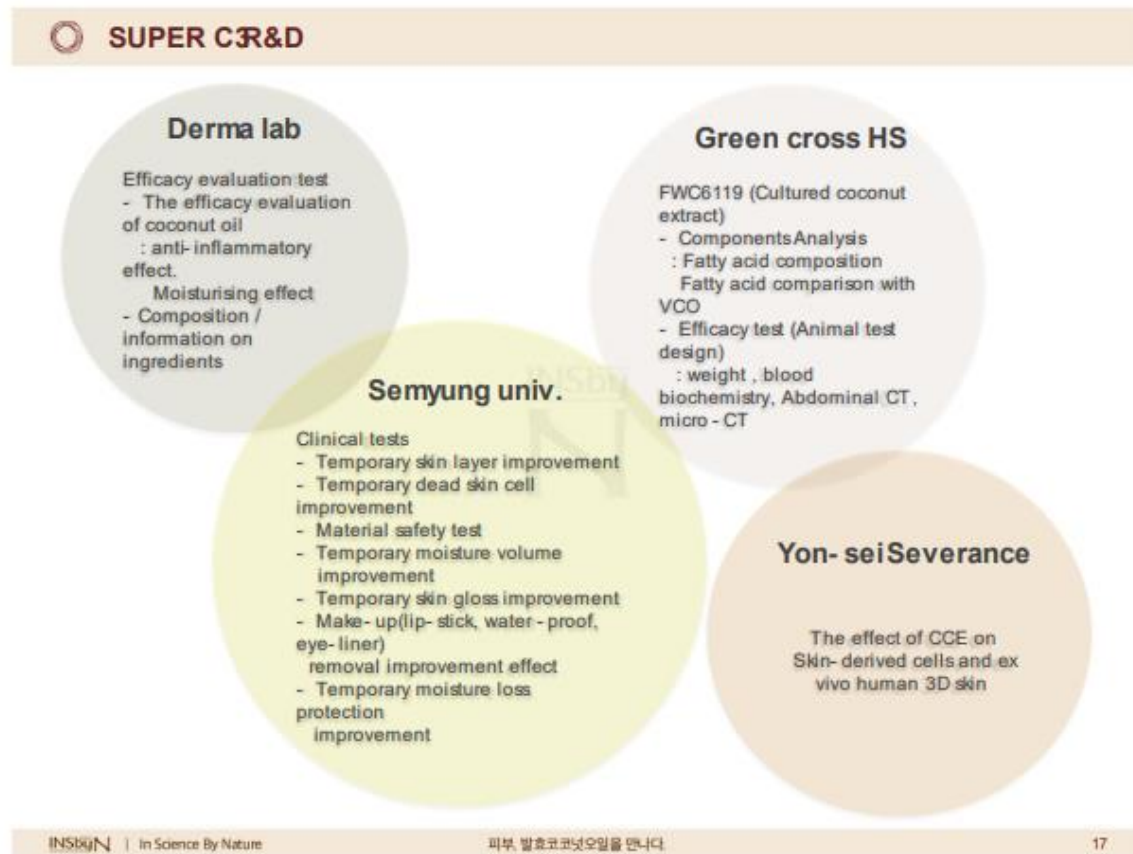
**Lee Kwang Sik**

Visiting Researcher, Korea Agricultural Development Agency  
 Professor, Department of Applied Life Sciences, Dong-A University

**Ahn Hee-young**

Professor, Department of Biological Engineering, Dong-A University

Lead By Prof OK Min, the progress is as below



**FIGURE 1.** Research and Development of SUPER C3 in Korea



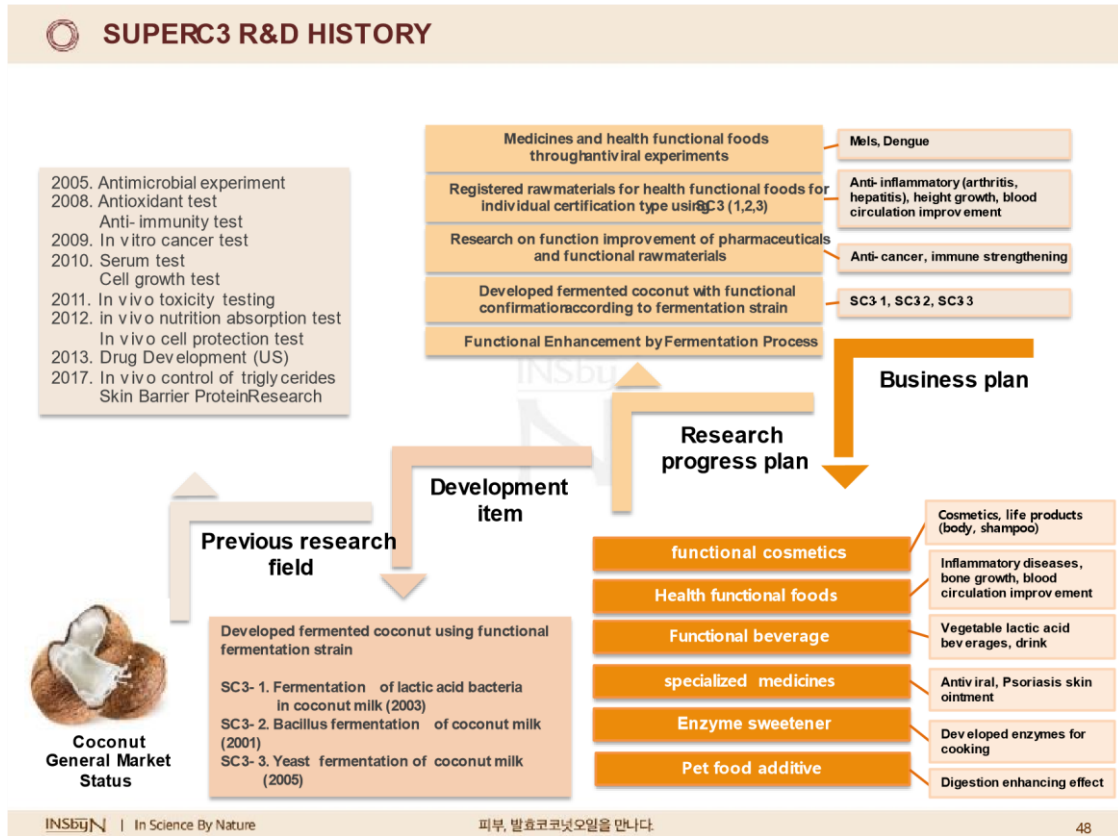


FIGURE 2. Chronology of the development and testing of SUPER C3

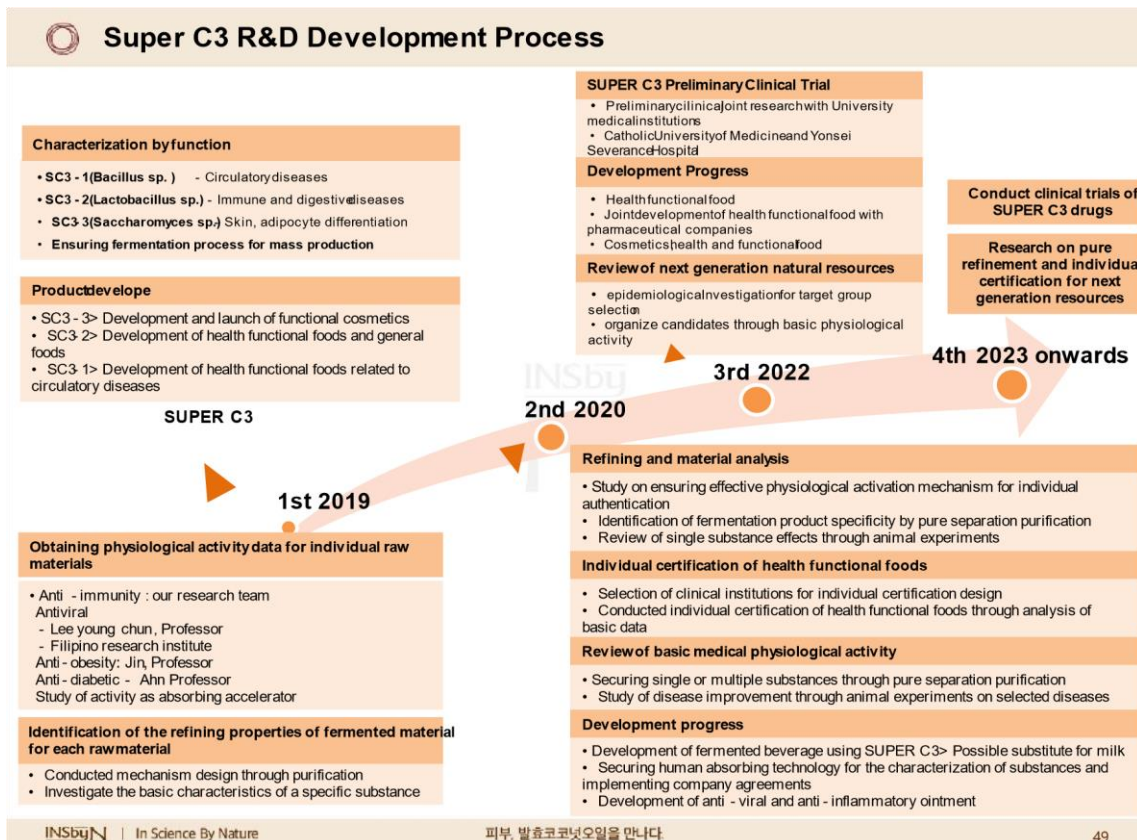
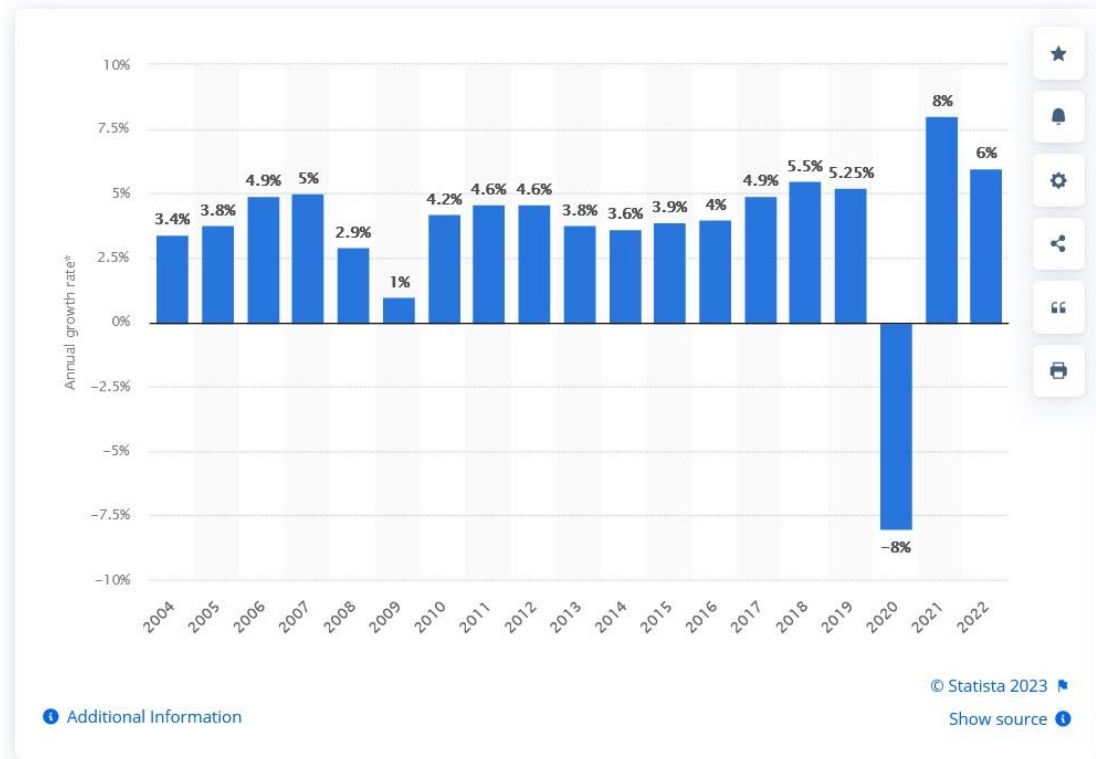


FIGURE 3. Development of SUPER C3 from year 2019

Based on all above we have selected 4 main market that SUPER C3 may eventually become and important component of. Each of these is presented in very brief summary below.

i. The Cosmetic Market: Skin and hair care

The worldwide cosmetic business is divided into six major categories, with skincare accounting for 33.8% of the global market from 2004 to the present. The rising demand for innovative and sophisticated cosmetic products with a natural and scientific foundation is a major market driver. Cosmetic market product is worth USD 635.7 billion in 2019



**FIGURE 4.** The rising demand of cosmetic market globally

ii. The Diabetes Market

Diabetes affects a large number of individuals worldwide: 537 million people will have diabetes by 2021. This figure is expected to rise to 783 million by the year 2045. Diabetes costs the world a lot of money. Diabetes-related healthcare treatment will cost 966 billion US dollars worldwide in 2021. The United States alone spent over 380 billion US dollars of the worldwide amount for 2021. Diabetes healthcare expenditures are anticipated to rise by 84 billion US dollars by 2045.

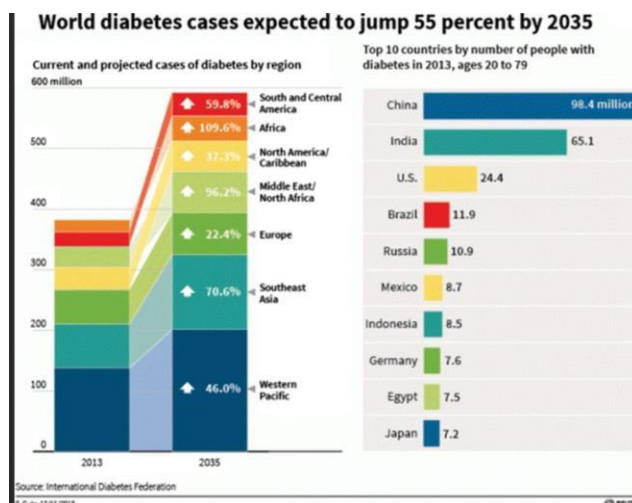


FIGURE 5. Total diabetes cases based on geographically

iii. Dengue Market

Dengue is categorised as a neglected illness by WHO, and there are presently no authorised vaccines or medications for the treatment of dengue virus infection (Geoffrey Dow 2012). The worldwide dengue vaccines market is estimated to be worth roughly \$965 million USD by 2028, up from around \$325 million USD in 2021. In Latin America and the Caribbean, the number of dengue cases is expected to reach about three million by 2022.

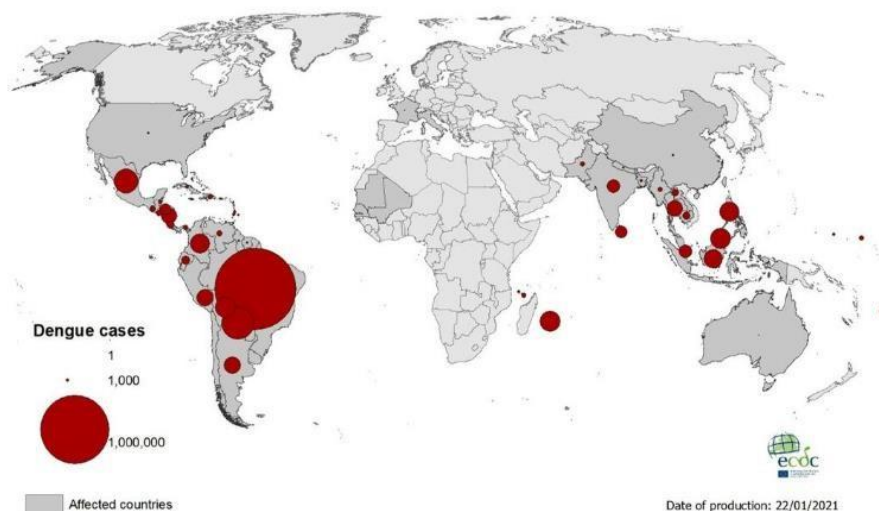
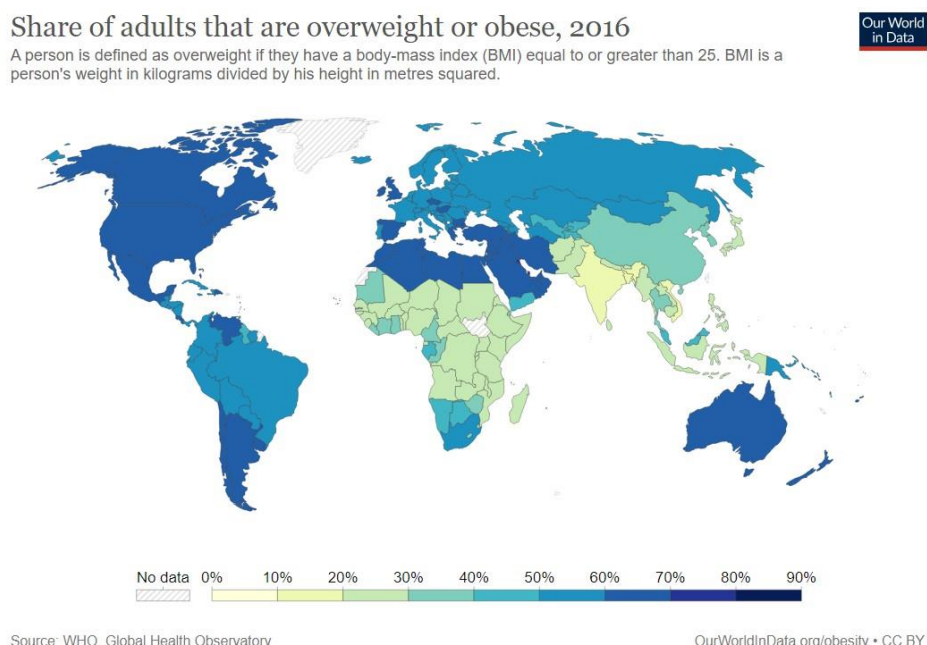


FIGURE 6. Dengue case globally

iv. The Weight management market

Weight management refers to the practise of making lifestyle and nutritional modifications in order to maintain a healthy body weight. Based on the person's height, gender, and age, most weight control treatments emphasise healthy diet and daily physical exercise. People nowadays use a variety of weight-loss programmes, which include meal replacement products, low-calorie meals and drinks, low-calorie sweeteners, green tea/herbal tea, exercise programmes, and surgeries. In 2022, the worldwide weight management market will be worth US\$ 503.8 billion. Looking ahead, IMARC Group forecasts the market to reach US\$ 722.8 billion by 2028, with a compound annual growth rate (CAGR) of 6.1% from 2023 to 2028.



**FIGURE 7.** No of adults that are overweight in 2016

## RESULT AND DISCUSSION

As discussed in the previous sections, the commercialisation of bioactive compounds of the Malaysian rainforest faces major hurdles due to the exorbitant capital requirement for drug development. However, we do not have the luxury to waste time and must start our journey in generating new mega revenue generators beyond petroleum and palm oil. To address the capital challenge, we need to create a capital ecosystem to move the Malaysian biotechnology industry. The Malaysian government should collaborate with global investors and global sovereign funds that value and understand the significance of drug development through a special purpose vehicle, the Global Rainforest Biotechnology Gateway (“GRBG”).

The idea of GRBG comes from the establishment of the largest technology-focused investment fund, Softbank Vision Fund (“**Vision Fund**”) of Japan in 2017. With a size of USD100 billion, Vision Fund’s anchor investor is the Public Investment Fund (“**PIF**”), a sovereign fund of Saudi Arabia. Creating a biotechnology investment fund will attract more diverse global investors due to its numerous downstream applications in the global market. Bill and Melinda Gates Foundation, Norwegian and Qataris sovereign funds are some of the potential anchor investors for GRBG. If materialised, Malaysia may be leading one of the top global venture funds. The question is how do we attract investors? The GRBG will serve as an intellectual property bank (“**IP Bank**”), housing world’s rainforest bioactive compounds as intellectual properties (“**IPs**”). GRBG may secure the rights to millions of bioactive compounds not just from our Malaysian rainforest but the Indonesian and Amazon rainforest among others. The sheer value of the IPs will attract global investors from various regions. The IP Bank will then be monetised through a series of initial public offerings (“**IPOs**”) fund raising. This will generate mega cash flows to support the commercialisation of bioactive compounds not just in Malaysia but globally too.

Essentially, GRBG is an initiative with sustainable and bankable green monetisation of biotechnology IPs. GRBG will develop an ecosystem that promotes the advancement of the Malaysian economy with huge technology and global capital input. GRBG will spearhead scientific research, large scale farming, preclinical, clinical trial, capital raising, corporate manoeuvre, marketing and other related activities for the commercialisation of these compounds, thus fostering the Malaysian drug development industry. This will easily create millions of job opportunities for our people and create huge socio-economic impacts to Malaysia.

GRBG will transform Malaysia into a global biotechnology hub beyond our imagination and propel Malaysia into a new economic era beyond petroleum and palm oil. This will catapult Malaysia onto the global biotechnology map attracting global scientists and biotechnology investors. Through GRBG, Malaysia will become a global leader in the biopharmaceutical and healthcare industry and open up numerous windows of opportunities with huge potential returns. GRBG will essentially break many global frontiers with its vision to globally dominate the world's rainforest bioactive compounds.

Under GRBG, numerous companies and special purpose vehicles will be established to accommodate scientific research activities, large scale farming, commercialization programs, global partnerships and collaborations, global IPOs, IP's ownership, global corporate maneuvers, production facilities, global marketing and other related activities. This will easily create millions of job opportunities for the people of Malaysia. Beyond this, GRBG will create a huge economic impact to Malaysia.

Essentially, the proposed GRBG is an eco-humanitarian initiative with sustainable and bankable green monetisation of biotechnology IPs. It develops an eco-system which promotes the advancement of Malaysian economy with huge technology and global capital input. The role of the Malaysian Government is to provide large tracts of land for agroceutical farming and biotechnology related industrial development. In addition, the Malaysian Government should also provide the seed capital to allow the initial operations of the GRBG. GRBG will transform Malaysia into a global biotechnology hub beyond the imagination of the Malaysian Government. This will catapult Malaysia onto the global biotechnology map attracting global scientists and biotechnology investors. New technologies beyond Artificial Intelligence will emerge from Malaysia. But most importantly, through GRBG, Malaysia will become a global leader in bio pharmaceutical and healthcare industry.

## **ACKNOWLEDGEMENT**

I would want to offer my heartfelt gratitude and appreciation to everyone who helped make this research effort a success. First and foremost, I would want to express my gratitude to Universiti Kebangsaan Malaysia for providing resources, facilities, and research help that have considerably aided the project's success.

I would like to express my heartfelt gratitude to our partner Naerok Resources Pty Ltd and researchers whose work served as the foundation for our study. Their perceptive contributions and devotion to the profession have been recognised. Their incisive contributions and devotion to the area have opened the way for new perspectives and ideas on the problems and potential in exploiting Malaysia's rainforest biodiversity for biotechnological progress and economic prosperity.

Furthermore, I'd like to thank the participants and responders who generously shared their expertise and experiences with me, allowing me to acquire significant insights and data for this study. Their inputs have been useful in enhancing the study's findings. I am also grateful to my family and friends for their unwavering encouragement, understanding, and support during this journey. Their unshakable faith in my ability has been both motivating and inspiring. Last but not least, I want to thank everyone for their help and contributions.

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## **“IT GOES BEYOND PRODUCT”: BUSINESS INNOVATIVENESS AND CONSUMER’S NEW VALUES ADOPTION**

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### **ABSTRACT**

*The concept of consumer behavior in today’s trend of competitiveness has been enriched by the study on consumer’s adaptation to new values. More specifically in this new era of digital technology business has been able to creatively promote values in which consumer’s loyalty is systematically developed. Business sells beyond product. Hierarchical regression and One-way Anova were employed to show the dynamic process of new values adoption. The respondents were Generation Z in Palembang – Indonesia. Within this scheme the process of new values adoption is conditioned by the innovative capacity of the business ie. innovativeness that attracts the market to learn newness. Consequently, consumer has become more advanced in his involvement to adapt with the innovativeness of the business. This conceptual research intends to rationalize the dynamic of consumer’s new values adoption within the frame of business innovativeness.*

**Keywords:** *business innovativeness, new values adoption*

### **INTRODUCTION**

The “it goes beyond product” perspective looks at the dynamics of new values adoption from two sides. First, the innovative power of businesses goes beyond producing products to values that change behaviour (Grönroos, 1997; Hanaysha et al., 2021; Trischler & Li-Ying, 2023; Varadarajan et al., 2022). Second, consumers define products as more than just a matter of tangibility or intangibility characteristics ie. products that can be seen physically or felt non-physically; but rather a space for value co-creation (Chang et al., 2022; Grönroos, 1997). Existing research shows the autonomy of customer value creation, where customers have access to create their own values. The process stems from the customer's existing values being used to respond to new values. In this process, there is often a value gap that leads to the dynamics of new values adoption (Erjavec & Manfreda, 2022; Hwang et al., 2022; Kasilingam & Krishna, 2022).

Existing references to the dynamics of adoption of new values include: (1) Businesses adopt relational and transactional intent. This concept marks the presence of novelty values of a product that can be used to build relationships. There is an attachment, which is a connection between the business and its market in the long term; and (2) Customers are in relational and transactional mode, which is a situation where customers are bound by various commitments formed in their capacity as consumers (Grönroos, 1997).





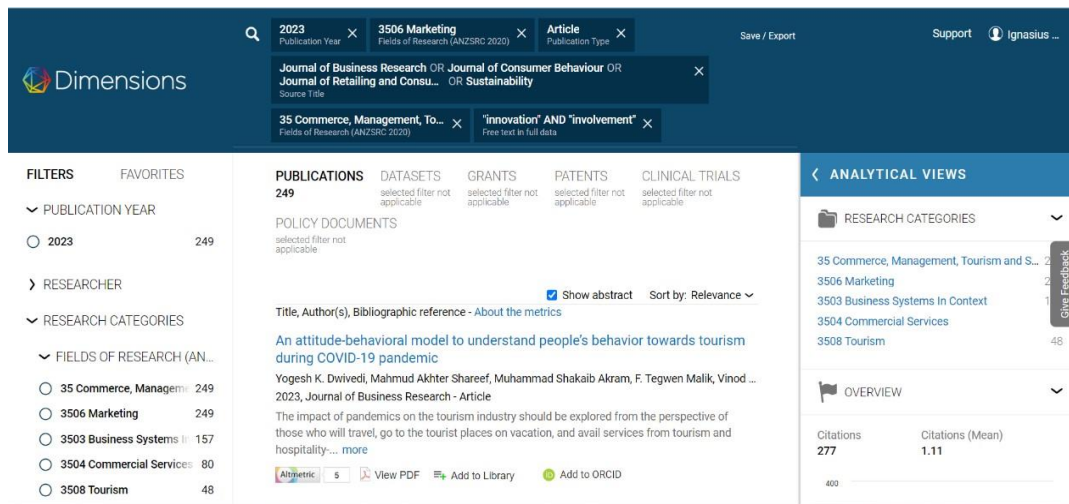


FIGURE 2. Data mining Dimensions

Furthermore, data processing was carried out using VOS viewer to see the trend of "innovation" and "involvement" studies (Figure-3).

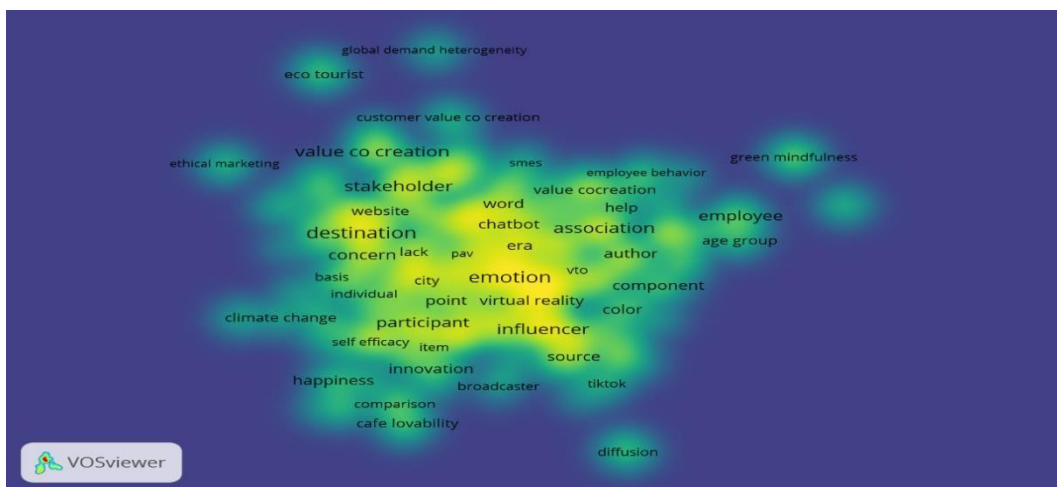


FIGURE 3. Output VOSviewer

From Figure-3 above, it can be seen that the trend of studies on business innovation and involvement levels will expand into new areas relevant to sustainability and knowledge values such as eco-tourism, global demand heterogeneity, green mindfulness and diffusion.

## LITERATURE REVIEW

Diffusion of Innovation Theory explains consumer adoption of new values follows a predictable pattern (Attié & Meyer-Waarden, 2022; Xia et al., 2022). Individuals are categorised into different segments according to their willingness to adopt new values, namely: (1) Innovators, are the originators of ideas; (2) Early adopters, are those who adopt new values because of profit opportunities without requiring tangible evidence; (3) Early majority, are those who adopt new values after obtaining tangible evidence of profit opportunities; (4) Late majority, are those who take a long time in the adoption of new values; and (5) Laggards, are those who are sceptical of new values.

Social Learning Theory views individuals learn behaviour through observation, imitation and reinforcement. The socialisation process is influenced by the suitability or specific needs of each gender.

However, business innovations that produce new products, along with new values, provide equal space or opportunity for each gender to be exposed to and triggered to adopt new values (Chen et al., 2022; Olfat et al., 2022). Each gender has the same capacity to adopt new values because they are exposed and triggered to the same opportunities.

Within self-identity perspective, self-concept and identity are demonstrated through choices in product consumption, as well as the resulting product values. The role of engagement in the adoption of new values is the process of aligning new values with self-concept and identity, or existing values (Garg & Saluja, 2022; Kautish et al., 2022; Kennedy et al., 2022; Michel et al., 2022). While according to Consumer-Brand Relationship perspective, consumers build attachment to brands beyond functional benefits to the level of trust, satisfaction, commitment and mutual benefits become the basis for the strength of loyalty to new values (Alvarez et al., 2023; Robertson et al., 2022; Santos et al., 2022), in the same generational cohort (Bordian et al., 2023; Thangavel et al., 2022).

## METHODOLOGY

The research is predictive using a quantitative approach. The research population was Generation Z students in Palembang City - Indonesia. Sampling convenience using non-probability sampling method technique as many as 391 respondents. The data analysis carried out includes: (1) Hierarchical Regression Analysis, aimed to see the dynamics of new values adoption through changes in R2 values before and after the presence of involvement variables in the influence of loyalty on the adoption of new values; (2) One-Way Anova, used respectively for the purpose of: (a) to see the dynamics of gender differences in the adoption of new values; (b) to see the dynamics of loyalty to the management of new values by age category and existing values; (c) to see the dynamics of participatory involvement in the management of new values by age category and existing values; (d) to see the dynamics of the adoption of new values by age category and existing values.

Data normality assumptions were made using Factor Analysis to see the suitability of indicators and factor loading in explaining each research variable. Validity and reliability tests were conducted using bivariate correlation analysis techniques and Cronbach alpha values.

Data collection was carried out with the following steps: (1) Qualitative data was obtained through interviews with three participants to clarify the research phenomenon; (2) Quantitative data was obtained using Google Form.

## RESULTS AND DISCUSSION

A total of 396 respondents completed the gender questionnaire. Of these, 65.9% were female, and 34.1% were male. The large share of one gender in this study suggests that the data analysis is oriented towards a gender-specific mindset. The findings are generalised, and specifically apply to the majority gender. Furthermore, a total of 395 respondents named their three favourite values at the time of the study, respectively: (1) Charity = love and generosity (34.2%); (2) Integrity = honesty, discipline and responsibility (22.5%); and (3) Humanity = humanity-orientated (15.4%). Of the 396 respondents who completed the questionnaire on the novelty of the favourite values; 264 of them (66.7%) agreed that the favourite values were novel (135 of them, or 34.1%, said that the favourite values were not novel).

### Pre-Requisite Test

There are three variables in this study, each of which meets the normality, validity and reliability assumptions, namely: (1) Loyalty (KMO and Barlett's Test = 0.869 ; Initial Eigenvalues = 3.463/57.714% ; Correlation is significant at the 0.01 level ; Cronbach's alpha = 0.850) ; (2) Involvement (KMO and Barlett's Test = 0.857 ; Initial Eigenvalues = 3.913/65.224% ; Correlation is significant at the 0.01 level ; Cronbach's alpha = 0.891) ; and (3) New Values Adoption (KMO and Barlett's Test = 0.869 ; Initial Eigenvalues = 3.756/62.600% ; Correlation is significant at the 0.01 level ; Cronbach's alpha = 0.880).

## Gender in the Dynamics of Adopting New Values

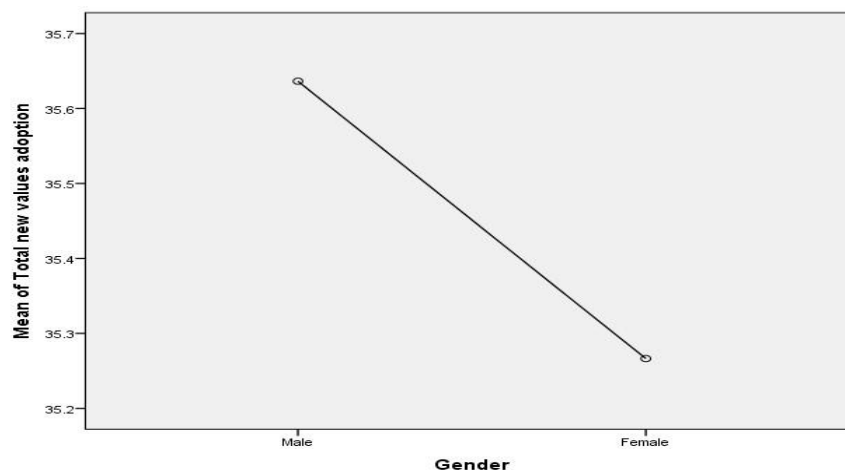
The dynamics of adopting new values in the frame of business innovation is not affected by gender differences.

**TABLE 1** Total New Values Adoption mean value based on Gender

Descriptives								
Total new values adoption								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	132	35.64	4.449	.387	34.87	36.40	22	42
Female	259	35.27	4.916	.305	34.66	35.87	21	42
Total	391	35.39	4.761	.241	34.92	35.86	21	42

**TABLE 2** Total New Values Adoption: ANOVA

ANOVA					
Total new values adoption					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.967	1	11.967	.527	.468
Within Groups	8827.163	389	22.692		
Total	8839.130	390			



**FIGURE 4.** Mean values of Total New Values Adoption and Gender

From a total of 391 respondents consisting of: (1) Male (132); and (2) Women (259). The significance level of the inter-group F value was 0.468 which was greater than 0.05. With this value  $H_0$  cannot be rejected. There is no effect of gender differences on the adoption of new values. The absence of gender differences can be explained where any individual's gender has the same information processing stage in the overall behavior of adopting new values. This finding is consistent with the theoretical framework of Diffusion of Innovation Theory (Attié & MeyerWaarden, 2022; Xia et al., 2022), as well as Social Learning Theory (Chen et al., 2022; Olfat et al., 2022). Business innovation produce new products

aimed at market segments that are not distinguished by gender. Products with new inherent values are aimed at all groups regardless of gender (Table 1, Table 2, Figure 4).

**The Role of Participatory Involvement on the Adoption of New Values**

The role of participatory involvement on the adoption of new values is shown through R<sup>2</sup> change of 7.5%.

**TABLE 3 R square**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.794 <sup>a</sup>	.630	.629	2.898	.630	663.241	1	389	.000
2	.840 <sup>b</sup>	.705	.704	2.592	.075	98.273	1	388	.000

a. Predictors: (Constant), Total loyalty

b. Predictors: (Constant), Total loyalty, Total involvement

**TABLE 4 Regression and residual score**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5571.417	1	5571.417	663.241	.000 <sup>b</sup>
	Residual	3267.714	389	8.400		
	Total	8839.130	390			
2	Regression	6231.801	2	3115.901	463.681	.000 <sup>c</sup>
	Residual	2607.329	388	6.720		
	Total	8839.130	390			

a. Dependent Variable: Total new values adoption

b. Predictors: (Constant), Total loyalty

c. Predictors: (Constant), Total loyalty, Total involvement

**TABLE 5 t score**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.905	1.193		4.112	.000
	Total loyalty	.853	.033	.794	25.753	.000
2	(Constant)	4.488	1.068		4.204	.000
	Total loyalty	.469	.049	.436	9.606	.000
	Total involvement	.412	.042	.450	9.913	.000

a. Dependent Variable: Total new values adoption



**TABLE 6** Excluded variables

Excluded Variables <sup>a</sup>						
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	Total involvement	.450 <sup>b</sup>	9.913	.000	.450	.369

a. Dependent Variable: Total new values adoption  
b. Predictors in the Model: (Constant), Total loyalty

The contribution of the model explaining the effect of loyalty on the adoption of new values is shown through the adjusted R2 value of 0.629 (62.9%). The addition of the involvement variable contributes as shown through the adjusted R2 value of 0.704 (70.4%). The change in adjusted R2 value of  $0.704 - 0.629 = 0.075$  (7.5%) is significant, with a significant level of t-value below 0.05 ( $H_0$  can be rejected), indicating the dynamics of engagement in the adoption of new values. The role of engagement significantly influences the adoption of new values (Table 3, Table 4, Table 5, Table 6).

### Loyalty Management of New Values by Age Category and Existing Values

Loyalty in managing new values according to age category and existing values is shown through Total Loyalty based on Age category (Table 7), Total Loyalty-1: ANOVA (Table 8), Mean value of Total Loyalty and Age range (Figure 5), Total Loyalty based on Existing Values (Table 9), Total Loyalty-2: ANOVA (Table 10), and Mean value of Total Loyalty and Existing Values (Figure 6). Generational gap explains the tendency of individuals in the same cohort to share unique experiences and historical contexts that shape attitudes, behaviors and preferences (Alvarez et al., 2023; Thangavel et al., 2022)

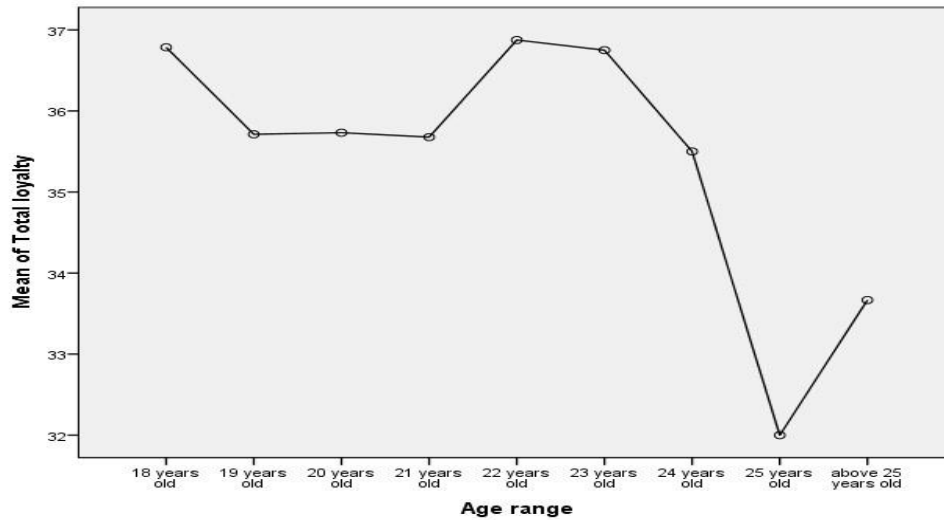
#### Loyalty Management of New Values by Age Category

**TABLE 7** Total Loyalty based on Age category

Descriptives									
Total loyalty									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
18 years old	14	36.79	3.704	.990	34.65	38.92	26	41	
19 years old	191	35.71	4.511	.326	35.07	36.36	21	42	
20 years old	134	35.73	4.624	.399	34.94	36.52	23	42	
21 years old	31	35.68	3.876	.696	34.26	37.10	25	42	
22 years old	8	36.88	2.416	.854	34.85	38.90	33	40	
23 years old	4	36.75	5.188	2.594	28.49	45.01	29	40	
24 years old	2	35.50	4.950	3.500	-8.97	79.97	32	39	
25 years old	1	32.00	.	.	.	.	32	32	
above 25 years old	6	33.67	4.546	1.856	28.90	38.44	27	39	
Total	391	35.75	4.432	.224	35.31	36.19	21	42	

**TABLE 8** Total Loyalty: ANOVA

ANOVA					
Total loyalty					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	69.853	8	8.732	.439	.897
Within Groups	7590.080	382	19.869		
Total	7659.934	390			



**FIGURE 5.** Mean value of Total Loyalty and Age range

The age difference has no effect on the loyalty of managing new values. It was found that the significance level of the F value between groups was 0.897 which was greater than 0.05 ( $H_0$  cannot be rejected). This finding is consistent with the concept of a generational cohort (Alvarez et al., 2023; Robertson et al., 2022; Santos et al., 2022) ie. born and raised in the same time period; have the same characteristic tendency in experience, values and loyal attitudes in managing new values (Garg & Saluja, 2022; Kautish et al., 2022; Kennedy et al., 2022; Michel et al., 2022) (Table 7, Table 8, Figure 5).

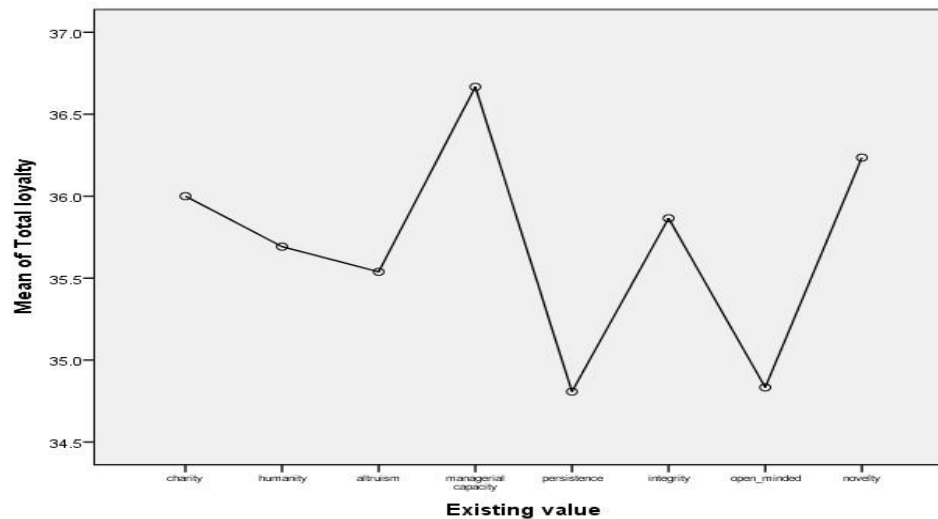
**Loyalty Management of New Values by Category of Existing Values**

**TABLE 9** Total Loyalty based on Existing Values

Total loyalty	Descriptives							
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
charity	135	36.00	4.359	.375	35.26	36.74	24	42
humanity	65	35.69	4.380	.543	34.61	36.78	24	42
altruism	13	35.54	3.126	.867	33.65	37.43	29	40
managerial capacity	9	36.67	3.708	1.236	33.82	39.52	31	42
persistence	26	34.81	3.919	.769	33.22	36.39	23	40
integrity	89	35.87	4.581	.486	34.90	36.83	24	42
open_minded	36	34.83	5.390	.898	33.01	36.66	21	42
novelty	17	36.24	4.549	1.103	33.90	38.57	27	42
Total	390	35.74	4.436	.225	35.30	36.18	21	42

**TABLE 10** F value of Total Loyalty

<b>ANOVA</b>					
Total loyalty					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	75.287	7	10.755	.542	.802
Within Groups	7579.556	382	19.842		
Total	7654.844	389			

**FIGURE 6.** Mean value of Total Loyalty and Existing Value

The output above shows the significance level of the F value between groups of 0.802 which is greater than 0.05 ( $H_0$  can't be rejected). There is no impact of differences of the values previously owned (existing values) on loyalty to the management of new values. These findings indicate that individuals carry out a process of alignment of existing values with new values (Garg & Saluja, 2022; Kautish et al., 2022; Kennedy et al., 2022; Michel et al., 2022). Alignment between existing values and new values can increase trust, satisfaction, commitment and mutual benefits (Alvarez et al., 2023; Robertson et al., 2022; Santos et al., 2022) (Table 6, Table 10, Figure 6).

### **Level of Participatory Involvement in Management of New Values by Age Category and Existing Values**

The level of participatory involvement in managing new values by age category and existing values is shown through Total Involvement based on Age category (Table 11), Total Involvement (1) – ANOVA (Table 12), Mean value of Total Involvement and Age range (Figure 7), Total Involvement based on Existing Values (Table 13), Total Involvement (2) – ANOVA (Table 14), Mean value of Total Involvement and Existing Values (Figure 8).



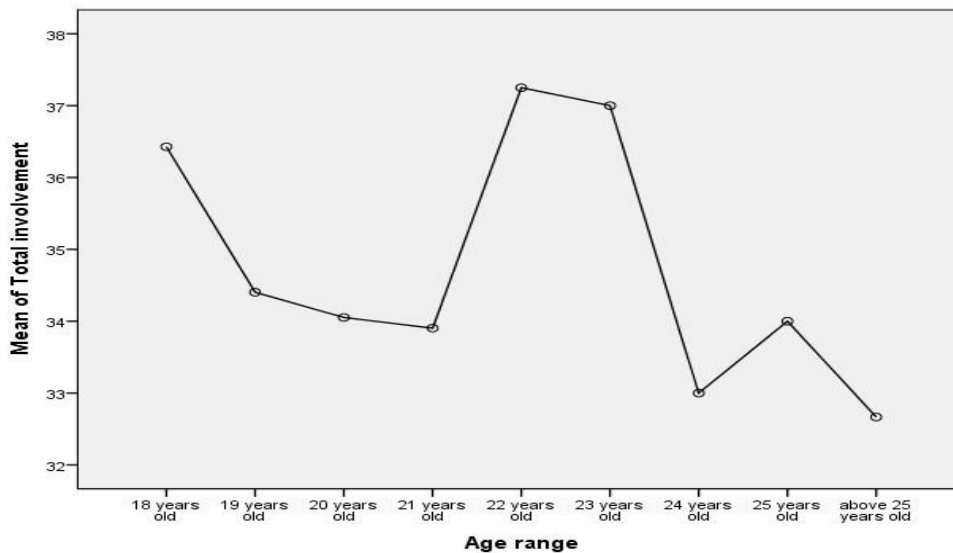
**Level of Participatory Involvement in Managing New Values by Age Category**

**TABLE 11** Total Involvement based on Age category

Descriptives								
Total involvement								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18 years old	14	36.43	3.031	.810	34.68	38.18	31	42
19 years old	191	34.40	5.357	.388	33.64	35.17	18	42
20 years old	134	34.05	5.225	.451	33.16	34.94	18	42
21 years old	31	33.90	5.455	.980	31.90	35.90	20	42
22 years old	8	37.25	2.121	.750	35.48	39.02	35	40
23 years old	4	37.00	1.826	.913	34.09	39.91	35	39
24 years old	2	33.00	2.828	2.000	7.59	58.41	31	35
25 years old	1	34.00	.	.	.	.	34	34
above 25 years old	6	32.67	6.683	2.728	25.65	39.68	24	42
Total	391	34.37	5.204	.263	33.85	34.88	18	42

**TABLE 12** Total Involvement: ANOVA

ANOVA					
Total involvement					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	195.137	8	24.392	.899	.517
Within Groups	10367.564	382	27.140		
Total	10562.701	390			



**FIGURE 7.** Mean value of Total Involvement and Age range

There is no impact of age difference on participatory involvement in managing new values. The significance level of the F value of 0.517 is greater than 0.05 ( $H_0$  cannot be rejected). This finding is consistent with the generational cohort perspective where individuals in the same cohort (same age

range) tend to have the same pattern of managing new values (Bordian et al., 2023; Thangavel et al., 2022) (Table 11, Table 12, Figure 7).

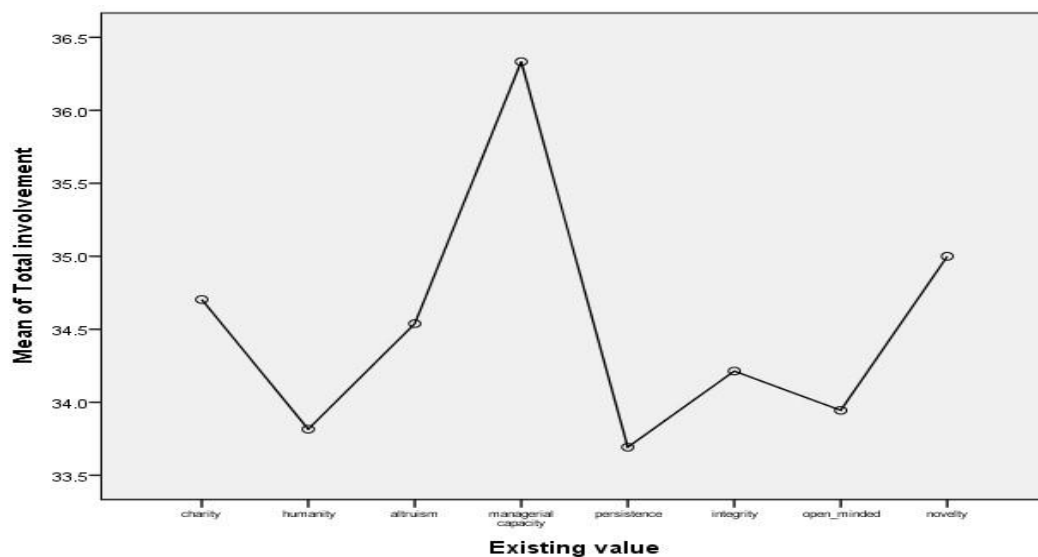
### *The Level of Participatory Involvement in Managing New Values According to the Previous Values Category*

**TABLE 13** Total Involvement based on Existing Values

Descriptives								
Total involvement	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
charity	135	34.70	5.221	.449	33.82	35.59	19	42
humanity	65	33.82	5.093	.632	32.55	35.08	19	41
altruism	13	34.54	3.755	1.042	32.27	36.81	28	40
managerial capacity	9	36.33	3.202	1.067	33.87	38.79	31	42
persistence	26	33.69	4.135	.811	32.02	35.36	24	42
integrity	89	34.21	5.346	.567	33.09	35.34	18	42
open_minded	36	33.94	5.957	.993	31.93	35.96	18	42
novelty	17	35.00	6.548	1.588	31.63	38.37	20	42
Total	390	34.35	5.203	.263	33.83	34.87	18	42

**TABLE 14** Total Involvement: ANOVA

ANOVA					
Total involvement	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	97.340	7	13.906	.509	.828
Within Groups	10433.535	382	27.313		
Total	10530.874	389			



**FIGURE 8.** Mean value of Total Involvement and Existing value

There is no influence of previous values on participatory involvement in the management of new values. The significance level of the F value of 0.828 is greater than 0.05 ( $H_0$  can't be rejected). Previously adopted values (existing values) can provide the same level of trust, satisfaction, commitment and mutual benefit to participatory involvement in managing new values. (Garg & Saluja, 2022; Kautish et al., 2022; Kennedy et al., 2022; Michel et al., 2022) (Table 13, Table 14, Figure 8).

**Adoption of New Values Based on Age Categories and Existing Values**

The adoption of new values based on age categories and existing values can be shown on Table 15 (Total New Values Adoption based on Age category), Table 16 (Total New Values Adoption 1 – ANOVA), Figure 9 (Mean value of Total New Values Adoption and Age range), Table 17 (Total New Values Adoption based on Existing Values), Table 18 (Total New Values Adoption 2 – ANOVA), and Figure 10 (Mean value of Total New Values Adoption and Existing value).

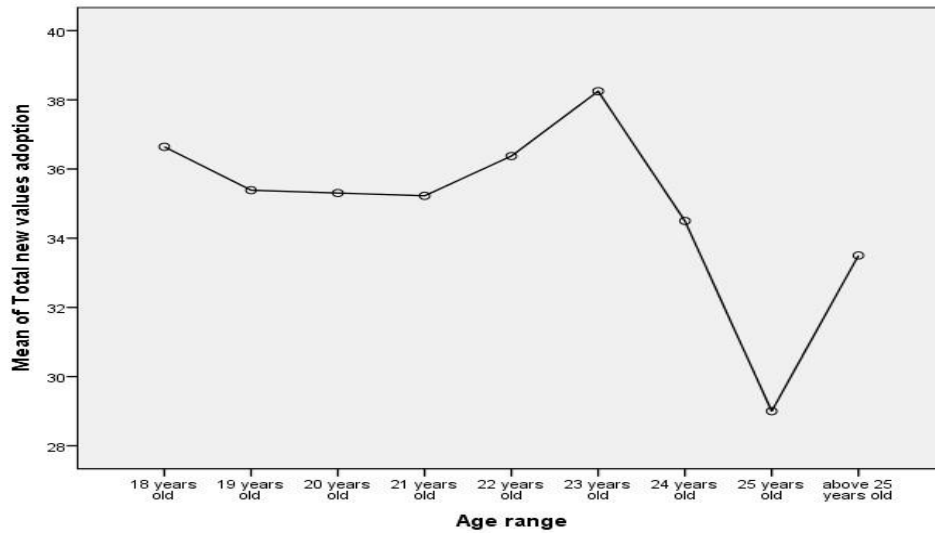
**The Adoption of New Values Based on Age Categories**

**TABLE 15** Total New Values Adoption based on Age category

<b>Descriptives</b>									
Total new values adoption									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
18 years old	14	36.64	3.003	.803	34.91	38.38	30	42	
19 years old	191	35.39	4.827	.349	34.70	36.08	21	42	
20 years old	134	35.31	4.848	.419	34.48	36.13	23	42	
21 years old	31	35.23	5.264	.946	33.29	37.16	22	42	
22 years old	8	36.38	1.506	.532	35.12	37.63	33	38	
23 years old	4	38.25	1.500	.750	35.86	40.64	37	40	
24 years old	2	34.50	7.778	5.500	-35.38	104.38	29	40	
25 years old	1	29.00	.	.	.	.	29	29	
above 25 years old	6	33.50	5.010	2.045	28.24	38.76	26	39	
Total	391	35.39	4.761	.241	34.92	35.86	21	42	

**TABLE 16** Total New Values Adoption: ANOVA

<b>ANOVA</b>					
Total new values adoption					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	128.087	8	16.011	.702	.690
Within Groups	8711.044	382	22.804		
Total	8839.130	390			



**FIGURE 9.** Mean value of Total New Values Adoption and Age range

There is no age difference in the adoption of new values. The significance level of F between groups of 0.690 is greater than 0.05 ( $H_0$  can not be rejected). Adoption of new values is carried out by individuals in the same age range (although each individual has a different age) as explained by the theoretical framework of consumer-brand relationship (Alvarez et al., 2023; Robertson et al, 2022; Santos and al., 2022) and generational cohort perspective. (Bordian et al., 2023; Thangavel et al., 2022) (Table 15, Table 16, Figure 9).

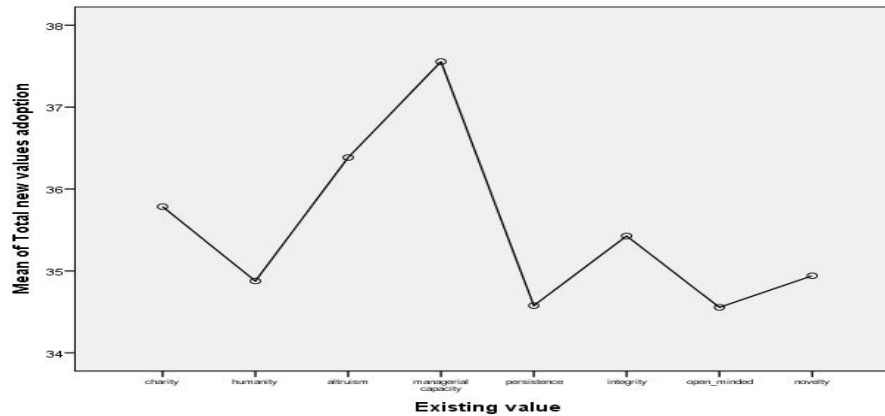
**Adoption of New Values by Category of Existing Values**

**Table 17** Total New Values Adoption based on Existing Values

<b>Descriptives</b>									
Total new values adoption									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
charity	135	35.79	4.643	.400	34.99	36.58	23	42	
humanity	65	34.88	4.788	.594	33.69	36.06	23	42	
altruism	13	36.38	3.776	1.047	34.10	38.67	28	42	
managerial capacity	9	37.56	3.812	1.271	34.63	40.49	30	42	
persistence	26	34.58	4.300	.843	32.84	36.31	25	42	
integrity	89	35.43	4.915	.521	34.39	36.46	23	42	
open_minded	36	34.56	5.229	.871	32.79	36.32	21	42	
novelty	17	34.94	5.584	1.354	32.07	37.81	22	42	
Total	390	35.38	4.763	.241	34.91	35.86	21	42	

**TABLE 18** Total New Values Adoption: ANOVA

<b>ANOVA</b>					
Total new values adoption					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	139.038	7	19.863	.873	.528
Within Groups	8687.036	382	22.741		
Total	8826.074	389			



**FIGURE 10.** Mean value of Total New Values Adoption

Differences in existing values have no effect on the adoption of new values. The findings show that the significance level of the F value is 0.528 which is greater than 0.05 ( $H_0$  cannot be rejected). This is consistent with the consumer-brand relationship which describes values that are able to build engagement to increase trust, satisfaction, commitment and mutual benefits that form the basis for the adoption of new values (Alvarez et al., 2023; Robertson et al., 2022; Santos et al., 2022), as well as alignment between existing values and new values (Garg & Saluja, 2022; Kautish et al., 2022; Kennedy et al., 2022; Michel et al., 2022) (Table 17, Table 18, Figure 10).

## CONCLUSION

The dynamics of adopting new values in the frame of business innovation is not affected by gender differences. The existing theory explains that individuals across gender have the same capacity to process information and make decisions based on their response to new values.

These dynamics include: (1) The role of participatory involvement in the adoption of new values is demonstrated through  $R^2$  change of 7.5% ; (2) Loyalty in managing new values according to age category and existing values, shown through scree plots that move dynamically; (3) The level of participatory involvement in the management of new values by age category and existing values, shown through a dynamically moving scree plot; and (4) Adoption of new values by age category and existing values, shown through a scree plot that moves dynamically.

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## **EFFECTS OF TECHNOLOGY READINESS ON CONTINUANCE INTENTION OF E-WALLET USAGE AMONG RURAL YOUTH IN MALAYSIA: TRUST AS A MEDIATOR**

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### **ABSTRACT**

*Understanding the continuance intention of e-wallet usage among rural youth in Malaysia is crucial in today's era of digital transactions. As digital payment methods gain prominence, it becomes increasingly important to examine how rural youth perceive and utilize e-wallets. However, despite the growing popularity of e-wallets, there remains a limited understanding of the factors that influence the continuance intention of e-wallet usage among rural youth in Malaysia. By investigating the role of technology readiness, encompassing factors such as optimism, innovativeness, discomfort, and insecurity towards technology, this study seeks to uncover how these factors affect the continuance intention of e-wallet usage among youth. Additionally, the study examines the mediating effect of trust, which plays a crucial role in reducing perceived risk and building confidence in e-wallet usage. A quantitative study was conducted using a self-administered questionnaire distributed to selected rural youth in the Malaysian East Coast Region by drawing insights from the Technology Readiness Index (TRI). The proposed model and the hypothesized relationships between variables were assessed using Partial Least Squares-Structural Equation Modeling (PLS-SEM), utilizing survey data from 500 respondents. The empirical results demonstrated that optimism, innovativeness, discomfort, and trust has significantly influenced the continuance intention of e-wallet usage among rural youth. Meanwhile, optimism, innovativeness, and discomfort indirectly affected the continuance intention of e-wallet usage among rural youth, with trust playing a mediating role in this relationship. In conclusion, this study informs policymakers and e-wallet service providers in developing strategies that enhance technology readiness, build trust, and promote the effective adoption and usage of e-wallets among rural youth. By addressing these challenges and leveraging the role of technology readiness and trust, rural youth in Malaysia can fully benefit from the convenience and advantages of e-wallets as a cashless payment*



*method.*

*Keywords: continuance intention of e-wallet usage; rural youth; technology readiness index (TRI)*

## **ABSTRAK**

*Memahami niat penggunaan berterusan e-dompet dalam kalangan belia luar bandar di Malaysia adalah penting dalam era transaksi digital hari ini. Memandangkan kaedah pembayaran digital semakin terkenal, semakin penting untuk mengkaji cara belia luar bandar melihat dan menggunakan e-dompet. Walau bagaimanapun, walaupun semakin populariti e-dompet, masih terdapat pemahaman yang terhad tentang faktor-faktor yang mempengaruhi niat penggunaan berterusan e-dompet dalam kalangan belia luar bandar di Malaysia. Dengan menyiasat peranan kesediaan teknologi yang merangkumi faktor-faktor seperti keyakinan, inovasi, ketidakselesaan dan rasa tidak selamat terhadap teknologi, kajian ini berusaha untuk mendedahkan bagaimana faktor-faktor ini mempengaruhi niat berterusan belia luar bandar menggunakan e-dompet. Selain itu, kajian ini mengkaji kesan pengantaraan kepercayaan, yang memainkan peranan penting dalam mengurangkan risiko yang dirasakan dan membina keyakinan dalam penggunaan e-dompet. Kajian kuantitatif telah dijalankan menggunakan soal selidik yang ditadbir sendiri yang diedarkan kepada belia luar bandar terpilih di Wilayah Pantai Timur Malaysia dengan mendapatkan pandangan daripada Indeks Kesediaan Teknologi (TRI). Model yang dicadangkan dan hubungan hipotesis antara pembolehubah dinilai menggunakan Partial Least Squares-Structural Equation Modeling (PLS-SEM), menggunakan data tinjauan daripada 500 responden. Keputusan empirikal menunjukkan bahawa keyakinan, inovasi, ketidakselesaan dan kepercayaan telah mempengaruhi niat penggunaan berterusan e-dompet dalam kalangan belia luar bandar. Sementara itu, keyakinan, inovasi dan ketidakselesaan secara tidak langsung mempengaruhi niat penggunaan berterusan e-dompet dalam kalangan belia luar bandar, dengan kepercayaan memainkan peranan pengantara dalam hubungan ini. Kesimpulannya, kajian ini memaklumkan pembuat dasar dan penyedia perkhidmatan e-dompet dalam membangunkan strategi yang meningkatkan kesediaan teknologi, membina kepercayaan, dan menggalakkan penggunaan dan penggunaan e-dompet yang berkesan dalam kalangan belia luar bandar. Dengan menangani cabaran ini dan memanfaatkan peranan kesediaan dan kepercayaan teknologi, belia luar bandar di Malaysia boleh mendapat manfaat sepenuhnya daripada kemudahan dan kelebihan e-dompet sebagai kaedah pembayaran tanpa tunai.*

*Kata Kunci: niat penggunaan berterusan e-dompet; belia luar bandar; indeks kesediaan teknologi (TRI)*

## **INTRODUCTION**

The advent of technological gadgets, wireless communications, and electronic payment systems has revolutionised transactional methods worldwide (Flavian, Gunailiu & Lu, 2020). Electronic wallets (e-wallets) are a means of payment by any electronic medium, such as a computer, laptop, or mobile, and they are also called as mobile wallets or digital wallets (Soodan & Rana, 2020). Smartphones have become capable of facilitating a wide variety of tasks and activities, demonstrating their successful penetration into virtually all aspects of life (Liebana-Cabanillas, Singh, Kalinic & Carvajal-Trujillo, 2021). E-wallets have brought a significant shift in conventional banking by offering convenient and cost-efficient payment services to users (Andrew & Tan, 2020). More specifically, the emergence of e-wallet services has brought about significant changes in the payment sector. This can be seen with an incessant rise of digital commerce, which many businesses have seen a monumental shift in their business models, and e-wallet adoption has received considerable attention from scholars (Lew, Tan Loh, Hew & Ooi, 2020).

E-wallet technology encourages users by providing them with access to their bank accounts and enabling various types of transactions, similar to manual methods, but with the convenience of being



accessible from anywhere and at any time. It can be included by retrieving the latest transactions, quick access to peer-to-peer transfer, electronic bill payments, balance checking, remote check deposits and fund transfers between a users' or another's accounts (Asnakew, 2020). All these transactions can be completed through a smartphone with installed e-wallet applications. The efficiency and effectivity of the transaction should be achieved to ensure that the sustained can be applied. In addition, the process of transactions by using a smartphone can be efficiently done instead of queuing in the bank office or ATM or using internet banking (Thusia & Maduku, 2020; Rahi & Ghani, 2019). Its inception in the banking industries provides comfortability, reliability, and ease of use (Thusia & Maduku, 2020). The continuance intention of e-wallet usage is also driven by the popularity of e-wallet services (Singh, 2020; Ren & Tang, 2020; Grover & Kar, 2020).

In fact, most businesses have turned to be cashless since the credit card era (Kumar, Israel, & Malik, 2018). This is not to mention that the cashless method is not only a fast-growing demand for most people due to its effectiveness and efficiency in transactions, but more importantly, it is critical in the COVID-19 pandemic era that has affected all nations since early this year. Thus, by analysing user acceptance and intention to continue to use is of great importance as the abnormality and inefficient use of emerging technology may also lead to business failures (Bhattacharjee, 2001). Besides, the marketers are encouraged to design a more productive, wearable e-wallet with price benefits such as coupons to increase the continuance intention of using e-wallet. The payment landscape has undergone a significant shift that was brought about by the COVID-19 pandemic. In the past, the overall acceptance of e-wallet was increasing at a slow pace. However, there was a drastic surge in e-wallet usage during the occurrence of COVID-19 pandemic (Sreelakshmi & Prathap, 2020). This is as advocated by the World Health Organisation (WHO) to be the precaution measures to contain the spread of the COVID-19.

What is needed from users is to adapt to a new cashless environment. This shift is easily adopted as it is a demand from most people. Put simply, the e-wallet has been radicalising effectively and efficiently the way individuals transact or complete the related transactions in any circumstance. For the banks, providing the e-wallet service is part of the continuous effort because of its aim to retain the existing customers and is part of the promoting the bank per se to reach the users. It essentially benefits both the providers and the users per se. Consequently, the youth have been found to be the largest users of latest technology and it is considered as a next step of youth to interact with internet of things (Wurmser, 2019). Despite the wide usability of the intentions' theories to investigate the popular technologies, scarce research is conducted on youths' continuance intentions and use behaviour in the context of e-wallets. Despite the advent of technology, few issues have been observed in the continuance intention of e-wallet usage (CIEU) such as previous research studies have shown that the continuance intention of e-wallet usage has declined from 70 percent to 55 percent, after the first purchase (Ledger & McCaffrey, 2018). Therefore, CIEU by rural youth in Malaysia has been the subject of researchers and practitioners.

The e-wallet usage has been applied more intensively in some countries such as the Netherlands, Germany, and most notably in the Scandinavian countries (Sreenu, 2020). Unlike the Western countries, the adoption of e-wallets in Asian countries is slow, with India, Singapore, and China leading the pack. It shows that rapid development of e-wallet usage led to economy that has no barriers at any time and market actors, such as governments, and businesses are prioritize on the advantages and the necessity of e-wallet transactions (Gorshkov, 2022). It is because youth can choose the payment method based on their preferences, rather than on an evaluation of the direct and indirect costs of using a particular payment method or the availability of the necessary infrastructure (Krivosheya, 2020). The spread of digital technologies through internet and social media deploys an inherent potential strategy to be applied by users widely (Scholnick, Massoud & Saunders, 2008; Sivathanu, 2019). Additionally, e-wallet platforms have emerged as an important organising form in many aspects of markets and society between industrial actors (Gawer & Phillips, 2013; Wang, 2021). The intensity of the e-wallets is usually determined by the number of retail transactions to project the volume of digital payments taking place and it includes business-to-business (B2B) transactions, individual-to-business transactions, and person-to-person payments (Sahayaselvi, 2017). Hence, the consideration of these factors determines the level of continuance intention of e-wallet usage.

Previous studies have evaluated on e-wallets mainly focuses on customer experiences and communications (Costello & Reczek, 2020), business models (Täuscher & Laudien, 2018), advertisers and policy makers (de Reuver, Sørensen & Basole, 2018), algorithm use and product or service

(Kohtamäki, Parida, Oghaza, Gebauer & Baines, 2019). While important, these studies only reveal a general, wide view related to cashless platform activity and reflect mostly the accomplished journey. Yet, vision alignment is a long and fragmented process that is affected by the influences of multiple actors in the construction of a new socio-technical order (Ciborra & Navarra, 2005). Studies in multiple disciplines have offered a similar analysis, including research in the fields of social informatics (SI) and science and technology studies (STS) (Flichy, 2010), along with information systems (IS) (Tilson, Lyytinen & Sorensen, 2010). Despite recent technological breakthroughs that have considerably enhanced electronic payment systems (Oyewole et al., 2013), Malaysians are unfamiliar with e-wallet technologies as the adoption of e-wallet has remained a barrier due to the presence of various types of cashless payment methods in the marketplace (Sivathanu, 2019).

According to Tee and Ong (2016), the adoption of e-wallets varies depending on the readiness of youth to prepare themselves to increase their continuance intention at various stages of the innovation process. However, there is a lack of comprehensive investigation into the impact of rural youths' readiness in using e-wallets continuously in Malaysia. Encouraging e-wallet usage is essential, as it contributes to economic growth and supports financial inclusion plans by promoting financial services and technology literacy. Hence, to address these research gaps, this study aims to investigate the determinants that lead to the CIEU among rural youth. Secondly, this study analyses the mediating role of trust of e-wallet usage among rural youth in Malaysia to depict a realistic picture of their continuance intention. Furthermore, understanding the factors influencing the CIEU among rural youth can help develop effective strategies to meet their expectations and consequently motivate them to continue using e-wallets. Finally, the study extends the findings of previous studies by distributing self-administered questionnaires to develop better decisions. This research also intends to validate the applicability of the Technology Readiness Index (TRI) in the context of CIEU among rural youth in developing nations of Malaysia.

## **CONTINUANCE INTENTION OF E-WALLET USAGE (CIEU)**

In this study, continuance intention can be defined as the level to which youth has established plans to continue using an information system (IS). According to Bhattacharjee (2001), the decision to continue using the system is similar to repurchase decision-making behaviour in information technology (IT). For instance, rural youth would have expectations before using e-wallet platforms based on their preferred involvement, interests in efficiency, and forming a convenient updated cashless platform. However, rural youth can be examined their passions with previous expectations after using the cashless platform. For e-wallet providers, it is crucial to build an effective, advanced e-wallet platforms as they can ensure to produce more new users with the intention of maintaining high users' retention. Moreover, it will lessen the tendency of providers to recoup their investment cost in installing and launching the e-wallet platform if the user does not quit after early uptake. According to Yan, Filieri, Raguseo, and Gorton (2021), they have systematised the categorisation of e-wallet platforms in e-commerce, e-service, entertainment, finance, and virtual platforms. Applied to this research, this study focuses on e-wallets which fall under the cashless payment category. The market differentiation is high due to the significant number of completed transactions favoured by rural youth using e-wallets as it offers convenience and high security features for users to install.

With the rapid change in technology, new payment technologies are gaining popularity and attracting increasing attention, replacing traditional methods (Flavian, Guinaliu & Lu, 2020). In recent years, studying rural youth behaviour and identifying the characteristics that favour or limit e-wallet usage have become significant priorities among various experts. However, Flavian et al. (2020) argued that many drastic and rapid changes in habits are compelling researchers to conduct in-depth research on technology-based payment methods. For example, changes in rural youth behaviour caused by the COVID-19 pandemic have led to the adoption technology-based (contactless) payment methods to maintain social distance (Esawe, 2022). On the other hand, many factors influence the continuance intention of rural youth to use specific payment methods, which is one of the primary reasons e-wallet usage varies by country (Flavian et al., 2020). In addition, these factors would differ based on the context (Esawe, 2022a). According to Teng and Khong (2021), many studies focus on the adoption of e-wallet, neglect rural youth usage, and combine them with non-users in analysis. Therefore, for e-

wallet usage to flourish, the government, services providers, and stakeholders must address critical issues, such as defining the key factors influencing the continuance intention of e-wallet usage. The primary research problem addressed in this study is comprehending the shallow rate of continuance intention despite of a high in e-wallet usage among rural youth (OBG, 2021). Thus, by an increase of CIEU led to save cost for e-wallet providers. It is due to the switching cost to another cashless platform can be reduced and rural youths' inclination to keep using e-wallet can be an indicator of competitive advantage for e-wallet providers.

A few researchers have assessed the impacts of different methods of e-wallet platforms. Previous studies have investigated on the impact of e-wallet towards the transactions completed over time and discover the perspectives from state capital and major cities regarding cashless transactions (Taasim & Yusoff, 2018). The study developed Technology Assessment (TA) and Unified Theory of Acceptance and Use of Technology (UTAUT) to uncover the result related to quality, skills, transaction costs, user satisfaction, and role of service providers (banks) and the influence of environment. However, despite an increase of e-wallet usage, some people still prefer to pay in cash (Van der Crujisen, Peters & Crone, 2017). As aimed for improving the efficiency and effectivity of the transaction by using e-wallet, this leads of it to be sustained used. In addition, the benefits of harnessing e-wallet can gain as the transactions privately using their smartphone efficiently, rather than queuing in the bank office or ATM or using internet banking (Rahi & Ghani, 2019; Thusia & Maduku, 2020). Its inception in the e-wallet platform provides comfortability, reliability, and ease of use (Thusia & Maduku, 2020). The continuance usage of m-banking is also driven by the popularity of the mobile payment (m-payment) (Handarkho, 2020; Yu et al., 2018) and e-wallet services (Singh, 2020; Ren & Tang, 2020; Grover & Kar, 2020).

### **E-Wallet usage among Rural Youth**

In fact, most businesses have transitioned to cashless payments since the credit card era (Kumar et al., 2018). Besides that, a previous study has clarified the factors that influence the adoption of new payment services, and two models in the payment context are developed (Dahlberg & Oorni, 2007). One model focuses on the factors affecting the adoption of mobile payments' services, while the other model relates to the determinants of electronic invoicing adoption. Meanwhile, a study analysing the recurrence of digital wallet usage among university students in South Kolkata and the monthly spending patterns of different age groups of students has been carried out (Routray, Khurana, Payal, & Gupta, 2019). This implies that youths' characteristics play a significant role in determining payment preferences of the users (Madan & Yadav, 2016; Deb & Agrawal, 2017). This is consistent with technological advancements which is steering toward cashless payment, and today's youth prefer instant gratification and minimal effort (Seng, Ibrahim, Yin & Maiyus, 2022). In relation to this, the highest number of digital natives in Malaysia belongs to youth who play an essential role in ensuring the country's digitalization initiatives are successful (Anis, 2021).

In a previous study, it was discovered that 89 percent of urban youth is accepting e-wallets compared to rural youth (Anushka, 2018). Other than high cash usage, it is found that low CIEU is due to excessive spending behaviour towards e-wallet usage (Aji & Adawiyah, 2021). The less transparent of physical money does not resemble banknotes which associated with spending behaviour among rural youth, and they are afraid on using e-wallet (Gafeeva, Hoelzl & Roschk, 2018). In 2016, 53.6 percent of internet users were youth who were highly engaged in online activities, contributing to the growth of e-wallet service providers and the promotion of a cashless society in Malaysia (Karim & Muhammad, 2022). However, it has been identified that rural youth in Malaysia still heavily rely on cash compared to urban youth (Sharon, 2019). This is due to the widespread acceptance of cash, with 80 percent of transactions being conducted in cash. Additionally, 50 percent of rural youth have a personal preference for using cash, and 37 percent feel more secure with physical money compared to e-wallets (PayNet, 2022). Although it has been found that rural youths have a greater interest in using e-wallets due to the extension of network beyond urban limits, allowing for wider access to e-wallet apps, there is still a low CIEU (Wong, 2022). There is a limited number of existing studies on CIEU, hence, this study will investigate the determinants of CIEU to ensure the e-wallet usage can be maintained.

## **Technology Readiness Index (TRI) and Hypotheses Development**

Technology Readiness Index (henceforth, TRI) was originally developed by Parasuraman (2000), and later updated into the TRI 2.0 (Parasuraman & Colby, 2015). This theory is developed to understand the readiness of rural youth to adopt cutting-edge technology, by considering individual differences. Most studies have used the four dimensions of TRI: optimism, innovativeness, discomfort, and insecurity (Rafidinal & Senalasar, 2021). Previous studies have demonstrated that individuals have different personalities and attitudes toward the use of technology (Rogers, 2003). Technology readiness affects the acceptance of information technology and systems. This is supported by the work of Parasuraman (2000) who developed the TRI scale to measure the level of readiness to use technology. It has been shown that the TRI is interested in individuals' inclination to utilise technology rather than their competency in using it (Parasuraman & Colby, 2001). The TRI consists of four groups of users on the basis of personality traits: optimism, innovativeness, discomfort, and insecurity. To ensure e-wallet is continuously used, the TRI has been adapted as it is individual-specific (Bhatt, Ajmera, & Nayak, 2021). The sustainability of cashless usage also depends on the behaviour of individuals towards technology (Lu, Yu, Liu, & Yao, 2003).

As a construct, Parasuraman (2000) operationalized the TRI as the overall state of mind that comes from a gestalt of mental enablers (motivators) and inhibitors that collectively determine a youth's predisposition toward using new technologies. While optimism and innovativeness are both related positively to technology adoption, discomfort, and insecurity, on the other hand, are negatively related to technology adoption too. Motivators of the TRI refer to the positive traits regarding technology and they are represented by optimism and innovativeness. In the TRI, optimism refers to a positive attitude towards a certain technology, where the optimists think that technology can improve their flexibility and efficiency (Sinha, Majra, Hutchins, & Saxena, 2019). Further reviews on the TRI highlighted that researchers like Acheampong, Zhiwen, Asante, Akai, Otoo, Boateng and Bediako (2017); and Walczuch, Lemmink, and Streukens (2007) considered optimism as a construct in relation to the feelings of worry, concern about bad experiences, and emotional distress. This suggests that as rural youth's optimism towards technology increases, their feelings of worry, concern about bad experiences, and emotional distress related to technology decreases. In contrast, technological pessimism is related to an irrational and negative mentality to condemn technology, disclosing the negative outcomes of technology such as repressing, controlling, and enslaving humans.

As for innovativeness, it is a trait that leads rural youth to believe that they can be technology pioneers and/or thought leaders and it is known as a motivator of the TRI. This trait is related to people's inclination to explore and try new things (Parasuraman & Colby, 2001). Innovative rural youth prefer to explore which makes them more open to accepting a new technology. Another key aspect of innovativeness is the tendency for people to collect and share information. The innovative users prefer learning new things and develop as they would then tell other people what they have learned. In general, innovative rural youth play an important role in giving advice to others (Parasuraman & Colby, 2001). Rural youth with high innovativeness traits has been described as those who would possess powerful inherent inspiration when it comes to the use of a new technology as they cherish the excitement of trying the innovation (Hemdi, Rahman, Hanafiah, & Adanan, 2016). It is also explained that on an abstract level, all users have an inborn inclination to be attracted to innovation's unique qualities. In general, this is referred to as innate innovativeness and it concerns the inherent propensity that user has when it comes to desire related to innovation adoption. This leads to new innovators of new services and products as they are motivated by other user about the innovation's unique quality. This is why user's innovativeness can boost the new product learning process.

Inhibitors of the TRI refer to the negative traits in relation to technology, namely, insecurity and discomfort. Insecurity can be defined as the distrust people have towards technology as well as them having scepticism about the technology's ability to work properly (Parasuraman & Colby, 2015; 2001; Parasuraman, 2000). While it shows some degree of similarity with discomfort, there is a fundamental difference between this facet and discomfort, as insecurity focuses more on specific technology-based transaction aspects rather than lack of comfort pertaining to the technology in general (Parasuraman & Colby, 2001). Parasuraman and Colby (2015) stated that insecurity is a combination of rural youths' concerns on technology's undesirable consequences, its safety issues, as well as the need for assurance. Hemdi et al. (2016) explained that insecurity resulted from the absence of trust in

technology and its capacity to function legitimately. According to Blut and Wang (2019), insecurity is negatively related to value, where sceptical users have the tendency to anticipate danger instead of benefit when it comes to using technology and would result in the development of lower value perception on technology and its usage.

On the other hand, discomfort is another inhibitor that can be defined as a negative feeling experienced by rural youth when they feel pressured by a certain technology and perceive a lack of control over it (Parasuraman & Colby, 2015). Rural youth may also feel overwhelmed by technology and have a sense of discomfort. Additionally, discomfort refers to the extent to which rural youth may harbour prejudice towards technology (Lin & Chang, 2011). Rural youth with high discomfort traits would consider technology as more complex. They believe that technology is too complicated and is not designed to be used by normal users (Massey, Khatri & Minas, 2013). As such, they perceive technology as something that is not easy to use (Walczuch et al., 2007). They additionally recognise technology as something overwhelming and uncontrollable, which ultimately would lead them to a lower quality perception no matter what the actual outcome would be (Blut & Wang, 2019). Rural youth with discomfort traits become anxious and uncomfortable when it comes to using technology because they think that they are being controlled by technology (Ahmed, Ahmad, Ahmad, & Zakaria, 2019). It is because rural youth perceived lack of control and possess little confidence when it comes to using technology, henceforth consider using it as more difficult (Blut & Wang, 2019). Thus, in this study, it is hypothesized that:

*H1: Optimism and CIEU among rural youth are positively related.*

*H2: Innovativeness and CIEU among rural youth are positively related.*

*H3: Insecurity and CIEU among rural youth are negatively related.*

*H4: Discomfort and CIEU among rural youth are negatively related.*

### **Trust as A Mediator**

Trust can be defined as the willingness of one party to rely on another party who has received the trust (Khoirun Nisa & Aslamatis Solekah, 2022). It is explained as users' belief in ensuring integrity, ability, and benevolence (Koghut & Ai-Tabbaa, 2021). Users believe towards cashless payments is crucial as it is directly associated with continuance intention of e-wallet usage (Kim, Mirusmonov, & Lee, 2010). It is because the continuance of e-wallet usage will be determined by the success or failure of trust (Dillon Hastomo & Aras, 2018). However, users with low trust in e-wallet will avoid them to use e-wallet (Shaw, 2014). The statement has been supported by researchers who also agree that trust is formed by rural youths' previous experiences and influences their CIEU (Al-Dwairi & Al-Ali, 2022). This is due to trust is pivotal in involving transactions with multifarious uncertainties and risks (Sharma, Banerjee, Tiwari & Patni, 2021).

Based on past studies, trust acts as a mediator, and it has been proven that the influence of trust affects the usage of cashless payment system and leads to the impacts of continuance intention of cashless usage, particularly e-wallets (Singh & Sinha, 2020). Trust is guaranteed to have a better experience towards the CIEU, and the most significant long-term facilitator included for the success of e-wallet platforms (Humbani & Wiese, 2018). The trusted e-wallet platforms that meet the expectations of the rural youth are positively influencing the CIEU, and they can use them in many other countries (Commer, Islam, Muhammad, & Ahmer, 2020). This statement is aligned with the reliable services produced, and ensuring they are feeling more guaranteed to use e-wallets (Gao & Waechter, 2017). The action of repurchase can be engaged by the rural youth as it was mediated by their trust towards the services provided (Istanbulluoglu & Sakman, 2022). However, when the services are failed, it leads to an uncertainty of the service's future performance (La & Choi, 2012). Therefore, trust acts as a mediator and it is hypothesized that:

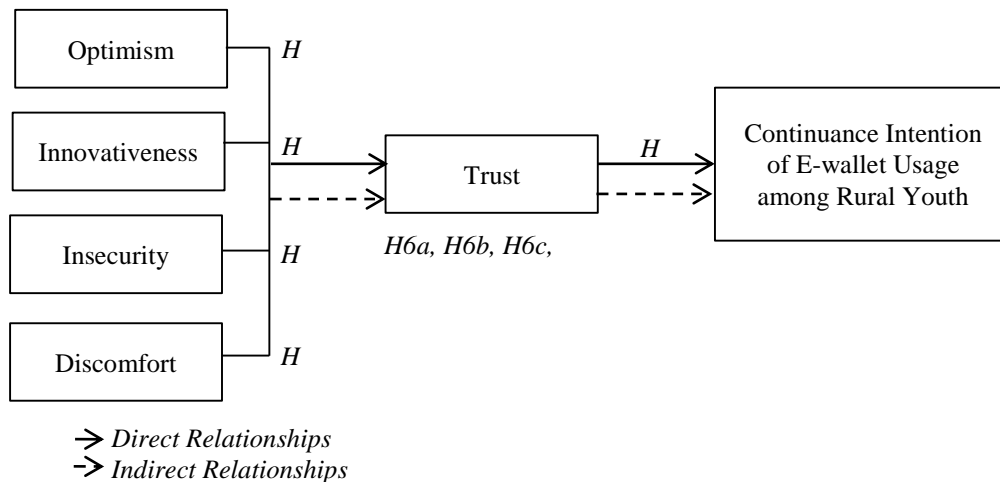
*H5: Trust and CIEU among rural youth are positively related.*

*H6a: Trust mediates in the relationship between optimism and CIEU among rural youth.*

*H6b: Trust mediates in the relationship between innovativeness and CIEU among rural youth.*

*H6c: Trust mediates in the relationship between insecurity and CIEU among rural youth.*

*H6d: Trust mediates in the relationship between discomfort and CIEU among rural youth.*



**FIGURE 1.** Proposed Research Framework

## METHODOLOGY OF STUDY

This quantitative research examined the effects of the TRI on the CIEU among rural youth in Malaysia, with trust acting as a mediator. The variables included optimism, innovativeness, insecurity, discomfort, trust, and CIEU among rural youth. This study was conducted at *Pusat Komuniti Desa* (PKD) in the East Coast regions of Kelantan, Terengganu, and Pahang. The sample consisted of 500 rural youths selected through purposive sampling. The independent variables in this study were optimism (OPT), innovativeness (INNO), insecurity (INS), and discomfort (DIS). The dependent variable was the continuance intention of e-wallet usage among rural youth (CIEU), while the mediator variable was trust (TR). All the adapted items were referenced from previous studies. Items of optimism were adapted from Karim and Muhammad (2022), items of innovativeness were adapted from Na, Lee, and Yang (2021), items of insecurity were adapted from Na et al. (2021), items of discomfort were adapted from Parasuraman and Colby (2015), items for trust were adapted from Bhatt et al. (2021) and items related to the continuance intention of e-wallet usage were adapted from Karim and Muhammad (2022). The data analysis technique used was PLS-SEM with Smart PLS 4.0. Partial Least Squares (PLS) analysis is a multivariate statistical technique that compares multiple dependent and independent variables.

This study developed a self-administered questionnaire to investigate the relationship between the independent variables, mediating variable, and dependent variable. The self-administered questionnaire was designed to be simple, understandable, and unbiased to get reliable and valid information (Brant, Haas-Haseman, Wei, Wickham, & Ponto, 2015). The questionnaires were also written in the English and Malay languages, while Likert-scales consisted of five response was utilized for the purpose of rating. The respondents answered the questionnaire by using five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Besides that, for this study, non-probability sampling based on purposive was employed. The reasons of for using this sampling method were to save time, money, as well as ensuring a higher accuracy of the data (Cooper & Schindler, 2003).

In this study, the survey questionnaire included the independent, mediating, and dependent variables. These key variables were chosen based on past studies related to trend of e-wallet usage that is widely adopted but has a low continuance intention. The study procedure began with a call made to the Ministry of Rural and Regional Development to request permission to conduct research on rural youth from the PKDs in the East Coast region. Following this, the coordinator from the Ministry of Rural and Regional Development responded with an approval letter and informed the person-in-charge from each PKD about the research. Then, the researchers briefly explained the purpose of research, the required number of respondents in their respective areas and the procedures to be followed after completing the questionnaires. The persons-in-charge from the PKDs were required to distribute questionnaires to the rural youth in their areas. Before concluding the data collection, the researchers contacted all the persons-in-charge to ensure the questionnaires were collected.

For the full sample of 500 respondents, a two-step PLS-SEM approach was used to validate the outer (measurement) and inner (structural) models. Model validation, in general, guarantees that the quality of empirical work is attained through the use of both measurement and structural models (Henseler, Ringle, & Sarstedt, 2015). Validation of the measurement model was accomplished in this study by evaluating its internal consistency, indicator reliability, convergent validity, discriminant validity, and multicollinearity. Explanatory and predictive power were determined for the PLS-SEM structural model. Explanatory power was determined using two criteria: the coefficient of determination and the magnitude of the effect, whereas predictive power was determined using the path coefficient, predictive relevance, and relative impact.

## RESULTS AND DISCUSSION

In this study, the initial step of data analysis involved using IBM SPSS Version 29, followed by the Smart-PLS software. A total of 500 questionnaires were received and it was found that there were no missing values in the data, demonstrating that the respondents answered all the questions. A majority of the rural youth in the study were female, accounting for 71.4 percent. The largest age group among the rural youth was 21 to 25 years old (50.6 percent). As for the race, 92.6 percent of the respondents identified themselves as Malays. In term of the residential state, 38.6 percent of the respondents were from Pahang, and most of the respondents, accounting for 46.2 percent, held a bachelor's degree. Other than that, in terms of profession, 32.0 percent of the respondents were unemployed, and most households had a monthly income ranging from RM1,001 to RM2,000, accounting for 28.2 percent. Table 1 provides further details on the demographic data of the respondents.

**TABLE 1.** Demographic Data ( $n=500$ )

Items	Frequency	Percent
<i>Gender</i>		
Male	143	28.6
Female	357	71.4
<i>Age</i>		
15-20	62	12.4
21-25	253	50.6
26-30	68	13.6
31-35	54	10.8
36-40	63	12.6
<i>Ethnicity</i>		
Malay	463	92.6
Chinese	21	4.2
Indian	15	3.0
Bidayuh	1	0.2
<i>State</i>		
Kelantan	138	27.6
Terengganu	169	33.8
Pahang	193	38.6
<i>Highest Academic Qualifications</i>		
No formal education	1	0.2
UPSR	1	0.2
SPM/SPMV/SMA	96	19.2

Certificate	13	2.6
PT3/PMR/SRP	5	1.0
Matriculation/Foundation/STPM/STAM	23	4.6
Diploma	126	25.2
Bachelor's degree	231	46.2
Master's degree/MBA	4	0.8
PhD	-	-
<i>Profession</i>		
Unemployed	160	32.0
Self-employed	66	13.2
Non-Governmental Organization	11	2.2
Private Sector	155	31.0
Government Sector	108	21.6
<i>Marital Status</i>		
Married	161	32.2
Divorce	5	1.0
Never Married	334	66.8
<i>Household Monthly Income</i>		
No income	51	10.2
Below RM1,000	49	9.8
RM1,001-RM2,000	141	28.2
RM2,001-RM3,000	131	26.2
RM3,001-RM4,000	37	7.4
RM4,001-RM5,000	27	5.4
RM5,001-RM6,000	20	4.0
RM6,001-RM7,000	7	1.4
RM7,001-RM8,000	4	0.8
RM8,001-RM10,000	10	2.0
RM10,001-RM20,000	16	3.2
RM20,001 and above	7	1.4

To evaluate the effectiveness of the confirmatory factor analysis (CFA), this study assessed the reliability, convergent validity, and discriminant validity of the items. To determine convergent validity, Hair et al. (2010) suggested examining the loadings, composite reliability (CR), and average variance extracted (AVE). As presented in Table 2.0, the loadings of all items were higher than the recommended threshold of 0.5. The CRs of all constructs ranged from 0.965 to 0.911, exceeding the established cut-off of 0.70 (Nunnally, 1978; Gefen, Straub & Boudreau, 2000). Additionally, the AVE values were greater than or equal to 0.5, in line with Bagozzi and Yi's (1988) recommended value of 0.5, indicating that over half of the variance in the observable measurement items was explained by the latent factors, on average (Fornell & Larcker, 1981).



**TABLE 2.** Convergent Validity of the Reflective Items in the Measurement Model

Construct/Items	Loadings	CR <sup>a</sup>	AVE <sup>b</sup>
<i>Optimism (OPT)</i>			
E-wallets' products and services that use the newest technologies are much more convenient for me to use (OPT1)	0.732	0.907	0.662
I like the idea of doing business transaction via e-wallet because I am not limited to regular business hours (OPT2)	0.730		
I prefer to use the most advanced e-wallet technology available (OPT3)	0.836		
I like e-wallet application that allow me to tailor things to fit my own needs (OPT4)	0.867		
E-wallet technology makes me more efficient in my daily activities (OPT5)	0.858		
E-wallet technology gives me more freedom of mobility (OPT6)	0.847		
<i>Innovativeness (INNO)</i>			
In general, I am among the first in my circle of friends to adopt e-wallet when it appears (INNO1)	0.846	0.892	0.751
Other people come to me for advice on e-wallet (INNO2)	0.862		
I can usually figure out new high-tech products and services related to e-wallet without help from others (INNO3)	0.880		
I keep up with the latest e-wallet in my areas of interest (INNO4)	0.878		
<i>Insecurity (INS)</i>			
E-wallet lowers the quality of my relationships by reducing personal interaction (INS1)	0.476	0.667	0.662
Too much e-wallet distracts me to a point that is harmful (INS2)	0.824		
I do not feel confident doing business with a place that can only be reached online (INS3)	0.852		
<i>Discomfort (DIS)</i>			
It is embarrassing when I have trouble with e-wallet while people are watching (DIS1)	0.636	0.758	0.525
It seems my friends are learning more about the newest e-wallet than I am (DIS2)	0.609		
Technical support lines are not helpful because they don't explain things in terms of, I understand (DIS3)	0.798		
I do not consider e-wallet is safe especially for making payments at business online (DIS4)	0.830		
There should be caution in replacing important people tasks with technology especially e-wallet because e-wallet is not dependable (DIS5)	0.719		
<i>Trust (TR)</i>			
I trust transaction happening through e-wallet platforms (TR1)	0.845	0.886	0.719
I trust that providers of e-wallet platforms will not divulge any information to third party (TR2)	0.792		
I believe that in any case of e-wallet platforms, service provider will provide assistance (TR3)	0.891		
I believe all e-wallet platforms follow law (TR4)	0.860		
<i>Continuance Intention of E-wallet Usage (CIEU)</i>			
I intend to continue e-wallet in future (CIEU1)	0.933	0.919	0.861
I intend to increase my e-wallet usage in the future (CIEU2)	0.922		
I will keep using e-wallet as regularly as I do now (CIEU3)	0.928		

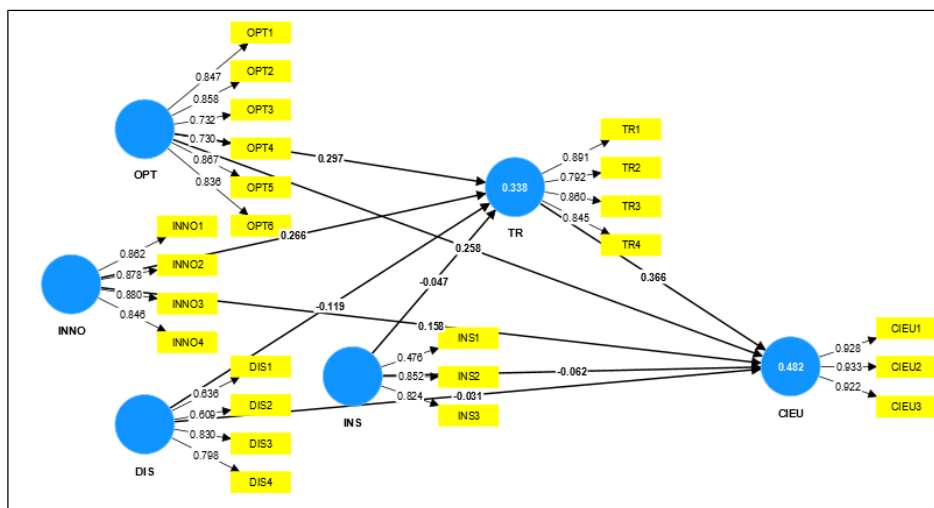
Notes: CR = (square of the summation of the factor loadings) / {(square of the summation of the factor loadings) + (summation of error variances)}; <sup>b</sup> AVE = (summation of the square of the factor loadings) / {summation of the square of the factor loadings} + (summation of error variances)}.

In this study, the discriminant validity of the components was determined using the heterotrait-monotrait correlations (HTMT) criterion. Henseler, Ringle, and Sarstedt (2015) argued that the Fornell-Larcker criterion, which is commonly used, has low sensitivity and may not be able to detect discriminant validity issues as effectively as the HTMT criterion. Based on the HTMT results presented in Table 3.0, none of the inter-construct correlations exceeded 0.90, indicating that none of the correlations met the HTMT.90 requirement. Therefore, the HTMT results confirmed a lack of discriminant validity.

**TABLE 3.** Heterotrait-monotrait Correlations (HTMT) Criterion

Constructs	CIEU	DIS	INNO	INS	OPT	TR
CIEU						
DIS	0.249					
INNO	0.634	0.202				
INS	0.204	0.79	0.087			
OPT	0.65	0.205	0.934	0.123		
TR	0.663	0.279	0.595	0.183	0.597	

In this study, the software packages SPSS (version 29) and SmartPLS (version 4.0) were utilized. The partial Least Square structural equation modelling (PLS-SEM) procedure in SmartPLS was performed to maximize the explained variance of the dependent latent variables, as recommended by Hair et al. (2010). The measurement model was assessed and analysed using various criteria, including internal consistency reliability, indicator reliability, convergent reliability, and discriminant validity, as discussed in the previous chapter. The hypotheses proposed in this study were evaluated using a two-stage PLS-SEM approach: 1) assessment of the measurement model, and 2) evaluation of the structural model, as outlined by Hair, Sarstedt, and Ringle (2012). Apart from that, the results of each path relationship in the model were generated using a bootstrapping method that allows the test of the statistical significance such as path coefficients and it is called as a non-parametric procedure. The bootstrapping was applied in order to identify the standard errors for hypothesis testing and it involved the replacement of original sample with repeated random sampling (Hair, Black, Babin, & Anderson, 2010). To test the inner validity and reliability of the conceptual framework of this study, PLS algorithm was run. Figure 2 illustrates the Measurement Model.



**FIGURE 2.** Measurement Model

### Hypotheses Testing

The first hypothesis (*H1*) states that there is a significant relationship between optimism and the CIEU among rural youth. The results reveal a positive and significant relationship between trust and the CIEU among rural youth ( $\beta = 0.897, t = 3.784, p\text{-value} = 0.000$ ). Thus, the proposed *H1* is accepted. The second hypothesis (*H2*) states that there is a significant relationship between innovativeness and the CIEU among rural youth. The results show a significant relationship between innovativeness and the CIEU among rural youth ( $\beta = 0.237, t = 2.305, p\text{-value} = 0.011$ ). Therefore, *H2* is statistically significant. The third hypothesis (*H3*) states that there is an insignificant relationship between insecurity and the CIEU among rural youth. The results show that insecurity does not have a negative significant relationship ( $\beta = 0.583, t = 1.448, p\text{-value} = 0.074$ ). Therefore, *H3* is statistically insignificant. The fourth hypothesis (*H4*) states that there is a negative significant relationship between discomfort and CIEU among rural youth. The results show that discomfort has a negative significant relationship ( $\beta = 0.707, t = 2.666, p\text{-value} = 0.004$ ). Therefore, *H4* is statistically significant. The fifth hypothesis (*H5*) states that there is a significant relationship between trust and the CIEU among rural youth. The results reveal that there is a positive significant relationship between trust and CIEU among rural youth ( $\beta = 0.870, t = 6.886, p\text{-value} = 0.000$ ). Thus, the proposed *H5* is accepted.

Mediation analysis is a straightforward approach to examine the individual and holistic relationships among research study variables (Cohen, 1988; Hair, Black, Babin, & Anderson, 2010). Statistically, mediation analysis can be applied to identify and explicate the observed relationship between an independent variable and a dependent variable by including an explanatory mediator (Baron & Kenny, 1986; Howell, 2009). Bootstrapping method in Smart PLS 4.0 version was applied in completion of testing mediation for the current study. To test the mediation hypotheses, this study followed Preacher and Hayes' (2004) by bootstrapping the indirect effect. Optimism  $\rightarrow$  trust  $\rightarrow$  CIEU ( $\beta = 0.897, p = 0.004$ ), innovativeness  $\rightarrow$  trust  $\rightarrow$  CIEU ( $\beta = 0.889, p = 0.017$ ) and discomfort  $\rightarrow$  trust  $\rightarrow$  CIEU ( $\beta = 0.707, p = 0.004$ ) have a significant mediation, meanwhile insecurity  $\rightarrow$  trust  $\rightarrow$  CIEU ( $\beta = 0.583, p = 0.157$ ) does not have a significant mediation. The confidence intervals bias corrected related to optimism, innovativeness and trust did not show any intervals straddling a 0, thus confirming the findings. Therefore, *H6a*, *H6b* and *H6d* are supported. For the main analysis, a total of 500 data were returned and 500 (100 percent) were completed and usable for further analysis. Overall, the results of this study reported that optimism, innovativeness, and trust (*H1*, *H2*, and *H5*) had the ability to influence the CIEU among rural youth. For the mediating analysis, the relationship among optimism (*H6a*), innovativeness (*H6b*), and discomfort (*H6d*) were significantly mediated by trust. Table 4 shows the path coefficient values, and Figure 3 illustrates the structural model of this current study.

**TABLE 4.** Path Coefficient and Hypotheses Testing

Hypotheses	Relationships	t-Value	p-Value	Decisions
H1	Optimism (OPT) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	2.699	0.004	Accepted
H2	Innovativeness (INNO) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	2.124	0.017	Accepted
H3	Insecurity (INS) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	1.009	0.157	Rejected
H4	Discomfort (DIS) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	2.666	0.004	Accepted
H5	Trust (TR) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	6.886	0.000	Accepted
H6a	Optimism (OPT) $\rightarrow$ Trust (TR) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	2.699	0.004	Accepted
H6b	Innovativeness (INNO) $\rightarrow$ Trust (TR) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	2.124	0.017	Accepted
H6c	Insecurity (INS) $\rightarrow$ Trust (TR) $\rightarrow$ Continuance Intention of E-wallet Usage (CIEU)	1.009	0.157	Rejected

	Intention of E-wallet Usage (CIEU)			
H6d	Discomfort (DIS) → Trust (TR) → Continuance Intention of E-wallet Usage (CIEU)	2.666	0.004	Accepted

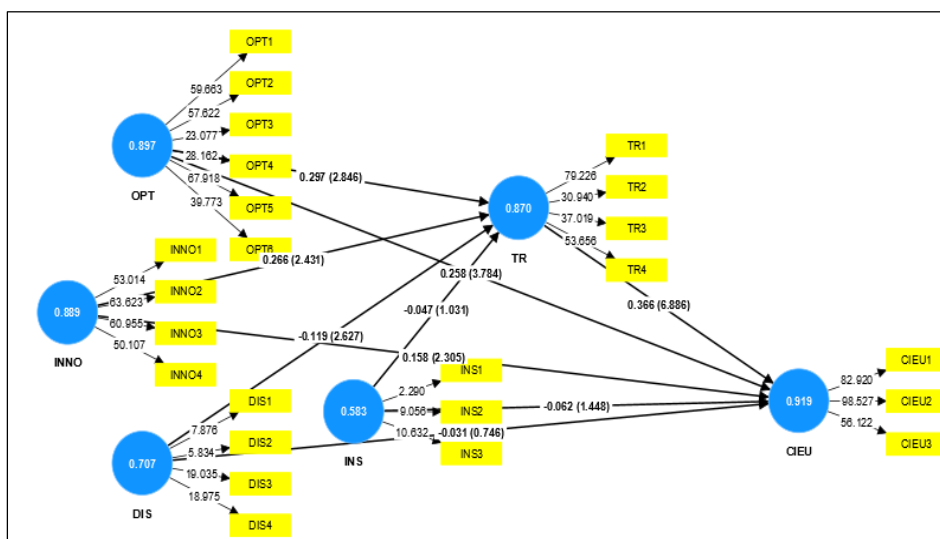


FIGURE 3. Structural Model

CONCLUSION

Based on nine hypotheses formulated, seven were supported and accepted. This study investigated the relationship among optimism, innovativeness, insecurity, and discomfort which have been adopted by the TRI, and mediated by trust towards the CIEU among rural youth in Malaysia. The research objectives were successfully addressed, providing insights into the determinants of continuance intention of e-wallet usage among rural youth, with trust as a mediator. The findings confirmed that optimism, innovativeness, discomfort, and trust had significant direct relationships with the CIEU among rural youth. Enhancing the CIEU, especially among rural youth, through proper policies and guidelines, holds potential benefits in progressing Malaysia towards a cashless society. This would also contribute to long-term economic and societal benefits by addressing transaction inefficiencies and reducing robbery cases.

This current study contributes to the development and understanding of existing knowledge, theories, and models in more depth related to the CIEU among rural youth. The formation of the framework of this study adopts the TRI as the main theory based on comprehensive review of literature by past researchers. The TRI has also been adopted which comprised of optimism, innovativeness, insecurity, and discomfort. Based on the results of this study, it is demonstrated that innovativeness exhibits strong influences on e-wallets and increases the rural youths’ continuance intentions. While some rural youth may express dissatisfaction with the features or services of their current smart e-wallet application, they may still maintain their behavioural status quo due to a belief that other applications lack substantial advantages to motivate switching or that the costs and risks of switching outweigh the benefits (Mutheiwana, 2021). This indicates their willingness to explore new possibilities, especially among rural youth who are often referred to as digital natives. When they have the opportunity to explore e-wallets by their own, it motivates them to make conscious choices about which application to use (Teo, Law & Koo, 2021).

This study also sheds light on the mediation effect of trust on the CIEU among rural youth in Malaysia. Therefore, it is recommended that e-wallet providers concentrate on increasing the level of comfort, for instance, by providing trainings or publishing instructional videos on e-wallet applications as well as sending personal emails to users in order to increase knowledge and skills about the use of e-wallet services (Guo & Jin, 2021). In addition, the results suggest that e-wallets should implement

effective marketing strategies such as offering free services, cashback rewards, redeemable vouchers and loyalty points. These incentives can increase user engagement and accessibility (Caitlyn & Bohannon, 2020). Additionally, leveraging social media for sharing user experiences, along with the provision of 24-hour customer services through call centres or toll-free numbers, can contribute to enhancing the CIEU, specifically among rural youth.

However, this study has certain limitations that could be addressed in future research. Firstly, the sample for this study was drawn from a single organization, Pusat Komuniti Desa (PKD), which may limit the generalizability of the findings to other organizations and countries. It is suggested that future studies include a larger and more diverse sample encompassing various cultural, social, and demographic groups to enhance the generalizability of the results. Additionally, considering the evolving complexities and expectations of user behaviour, such as rural youth, it is recommended to incorporate relevant variables that can provide a better understanding of rural youths' CIEU. This can be achieved by exploring variables such as perceived satisfaction with e-wallet usage and reviewing motivating factors (hedonic and utilitarian) as well as inhibiting factors (anxiety and emotions) that influence rural youths' perceptions. Future researchers are also suggested to incorporate more theories and models that are closely related to the CIEU among rural youth. Among the theories and models that have been used by previous researchers in studying the CIEU among rural youth are the Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation (DOI), Theory of Planned Behaviour (TPB), and Big Five Traits.

Moreover, as the current study did not investigate the moderators in the conceptual model, it is worth noting that gender is a commonly identified moderator regarding continuance intentions to use technology (Venkatesh, Thong, & Xu, 2012). Finally, as this study employed a quantitative method, it involved a larger sample size and did not require an extensive data collection period. However, it is important to acknowledge that this approach only captures a snapshot of the phenomenon and overlooks respondents' experiences in depth. To strengthen the research, future studies could adopt a longitudinal approach to compare pre- and post-adoption perceptions of rural youth over time, which would provide insights into the actual usage of e-wallets. This would allow for a comprehensive assessment of the CIEU among rural youth as well as offering a clearer apprehension of the performance. To put it another way, identifying the factors that encourage them to use e-wallet continuously must be developed and addressing demotivating factors are crucial for fostering acceptance of a cashless society among rural youth in Malaysia.

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# **CORPORATE INCOME TAX INCENTIVES AND DIGITAL COMPANIES' R&D INVESTMENT: A NEW EVIDENCE USING CHINA'S MICRO-PANEL DATA**

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## **ABSTRACT**

*Investment in R&D by digital enterprises is essential for fostering innovation and the growth of China's digital economy. However, little is known about the fundamental mechanics that accounts for the link between corporate income tax benefits and R&D spending by digital enterprises. Therefore, this study analyzes a sample of 800 publicly listed Chinese enterprises in the core industry of the digital economy from 2012 to 2021 to examine the effect of corporate income tax incentives on the R&D investment of China's digital companies. To investigate how corporate income tax incentives affect business decisions on R&D investment, a system generalized method of moment (GMM) estimate is used. The major conclusions showed that corporate income tax incentives had a significant and favorable impact on the R&D expenditures of China's digital enterprises. By dividing the sample into the relevant industries, we also discovered that the effect of corporate income tax on R&D investment has a different impact, in which some sectors for example software and computer communication and information technology service are affected more, whereas others industries like computer and other electronic equipment manufacturing industries are less responsive to the corporate income tax. The policy implication from this study suggests that the Chinese government could increase tax support for digital economy companies to encourage them to increase R&D investment, and they should also make corresponding preferential tax policies according to the industry to which digital enterprises belong, so as to promote the balanced development of various industries.*

*Keyword(s): Corporate Income Tax Incentives; Digital Companies; R&D Investment*

## **ABSTRAK**

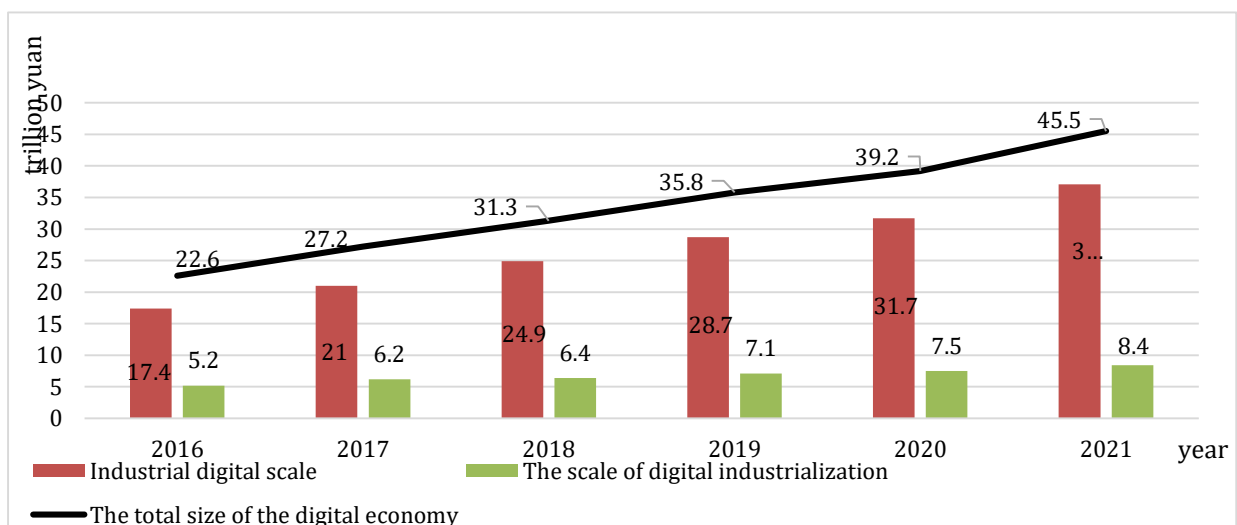
*Pelaburan dalam R&D oleh perusahaan digital adalah penting untuk memupuk inovasi dan pertumbuhan ekonomi digital China. Walau bagaimanapun, sedikit yang diketahui tentang mekanik asas yang menyumbang kepada hubungan antara faedah cukai pendapatan korporat dan perbelanjaan R&D oleh perusahaan digital. Oleh itu, kajian ini menganalisis sampel 800 perusahaan China yang disenaraikan secara terbuka dalam industri teras ekonomi digital dari 2012 hingga 2021 untuk mengkaji kesan insentif cukai pendapatan korporat ke atas pelaburan R&D syarikat digital China. Untuk menyiasat cara insentif cukai pendapatan korporat mempengaruhi keputusan perniagaan mengenai pelaburan R&D, anggaran kaedah momen umum sistem (GMM) digunakan. Kesimpulan utama menunjukkan bahawa insentif cukai pendapatan korporat mempunyai kesan yang ketara dan menggalakkan ke atas perbelanjaan R&D perusahaan digital China. Dengan membahagikan sampel kepada industri yang berkaitan, kami juga mendapati bahawa kesan cukai pendapatan korporat ke atas*

pelaburan R&D mempunyai kesan yang berbeza, di mana beberapa sektor contohnya perisian dan perkhidmatan komputer komunikasi dan teknologi maklumat lebih terjejas, manakala industri lain kurang. responsif kepada cukai pendapatan korporat. Implikasi dasar daripada kajian ini menunjukkan bahawa kerajaan China boleh meningkatkan sokongan cukai untuk syarikat ekonomi digital untuk menggalakkan mereka meningkatkan pelaburan R&D, dan mereka juga harus membuat dasar cukai keutamaan yang sepadan mengikut industri yang menjadi milik perusahaan digital, untuk mempromosikan pembangunan seimbang pelbagai industri.

*Kata kunci: Insentif Cukai Pendapatan Korporat; Syarikat Digital; Pelaburan R&D*

## INTRODUCTION

"Digital economy" is a new economic form where digital knowledge and information serve as the primary production input factors, the current information network serves as a significant carrier, and the efficient use of ICT (information and communications technology) enhances productivity and optimizes the economic structure. In the digital economy, technological innovation is a key strategic tool for transforming the economic development process and generating high-quality growth in the economy. Additionally, spending on research and development is a crucial component of technical innovation for businesses operating in the digital economy. In the past few years, the digital economy of China has rapidly expanded, exhibiting vast coverage and unmatched influence. This development has become a significant catalyst for reorganizing the economic system, reallocating factor resources, and boosting core competitiveness. China's digital economy increased to 45.5 trillion yuan in 2021, a gain of 16.2% year over year and 3.4 percentage points more than the country's GDP growth rate over the same time. Additionally, it represents 39.8% of GDP, demonstrating the crucial role the digital economy plays in China.



Data source: Compiled according to the "White Paper on China's Digital Economy (2021)".

**FIGURE 1.** China's digital economy's development from 2016 to 2021

A difficult issue that occurs in China's digital economy enterprises is a lack of innovation capabilities and R&D investment, despite the country's outstanding progress in this area (Xu Jianbin, 2022). The top 50 firms in each country's R&D statistics were sorted, and it was discovered that there was still a discrepancy between Chinese companies' R&D spending and that of industrialized nations. The top 50 Chinese firms spent an average of 1207.99 million euros on R&D in 2018, which was barely 30% of American spending (4079.17 million euros) and less than Germany and Japan (1537.41 and 1558.02 million euros, respectively).

One of the governmental strategies for promoting technological innovation and raising investment in R&D is tax incentives. According to the theory of endogenous economic growth, R&D spending is the key component of business innovation and development and has a significant influence on technological innovation (Romer, 1990). However, R&D investment activities have obvious positive externalities, leading to market failure and insufficient R&D investment (Arrow, 1962; Bloom et al., 2019). Additionally, the sharing and public welfare aspects of the digital economy are more apparent when compared to the general economic form, which will significantly dampen the excitement of digital economy firms for research and development (Zhang Sen et al., 2020). It is clear that the government must provide considerable support for the R&D investments made by enterprises in the digital economy because there are market failures. The preferential corporate income tax policy has been widely implemented in numerous nations as one of the key tools for the government to support company innovation since it can effectively lower R&D costs and encourage businesses to expand R&D investment. To encourage business technological innovation and boost capital investment in R&D, China has currently implemented a number of preferential corporate income tax policies, including tax reductions, pre-tax deductions, and accelerated depreciation. But how successful is the business income tax preference program in promoting R&D? How much of an effect would varying corporate income tax rates have on business R&D spending? How do digital businesses in various sectors react to favourable tax regulations differently? This article will examine these concerns.

The primary goal of this paper is to investigate how corporate income tax incentives impact the R&D expenditures made by the digital companies. This study examines the incentive effect of favorable corporate income tax policies on R&D investment in digital economy enterprises by defining the scope of digital economy's key industries in accordance with the "Statistical Classification of the Digital Economy and Its Core Industries (2021)" (China's Bureau of Statistics Order No. 33) and using China's A-share listed companies from 2012 to 2021 as the research sample. Additionally, in order to examine the heterogeneity of the influence of preferential corporate income tax policies on the R&D investment of digital economy companies in various industries, the digital economy will also be divided into three industries: computer and other electronic equipment manufacturing, software and information technology services, and Internet and telecommunications broadcasting. This study's motivations to examine the impact of corporate income tax incentives on R&D investment of China's digital companies can be explained by two crucial reasons. First, companies and policymakers involved in the digital economy will benefit from this study. By exploring the impact of tax incentives on R&D expenditures of digital companies, it has reference value for independent innovation, strategic adjustment and financial optimization of digital enterprises. This is also of great significance for the government to adjust the part of the tax policy that is not suitable for the further development of the digital economy, thereby improving the core competitiveness of China's digital economy enterprises.

In terms of the second dimension, by concentrating on the effect of tax incentives on R&D investment in digital economy businesses, this study adds to the body of knowledge already available on taxation in the digital economy. Most previous research on digital economy taxation focuses on tax collection and management issues such as whether to collect digital tax, the rules for identifying permanent establishments and the challenges to the tax system (Xu Xianchun et al., 2020; Zhao Tao et al., 2020; Wang Weijun et al., 2020). However, there are few studies on the impact of the tax burden reduction of the digital economy on R&D investment. Additionally, by choosing digital economy companies for research based on the most recent definition of the digital economy industry, this study also enhances the previous research. A recent research about the incentives of tax preferential policies on R&D expenditure of digital economy enterprises by Xu Jianbing (2021) only chooses high-tech enterprises as the research object without considering all the digital economy enterprises.

Five sections make up this article's structure. The second section covers the pertinent theoretical and empirical literature, while the third portion uses static and dynamic panel data estimation to describe the baseline empirical model. Section four summarized the key empirical findings and examined several robustness checks. The final portion comes to a conclusion and offers some policy recommendations of the study.

## LITERATURE REVIEW

The effect of tax incentives on R&D investment has been examined in a number of earlier studies. Within the broad area of research, there have been several streams of studies. One stream of research indicated that tax incentives can stimulate R&D investment of enterprises. Ma Yuqi et al. (2016), Cheng Yao and Yan Hui (2018) analyzed the effect of tax policy incentives on R&D investment of enterprises by constructing a PSM model. The study finds that tax incentives have a positive effect on the amount and intensity of R&D expenditure of enterprises. Gao Zhengbin et al. (2020) used the breakpoint regression model to study the impact of the income tax sharing reform on corporate innovation based on the data of Chinese industrial enterprises. Research shows that every 1 percentage point decrease in the tax rate will reduce the tax burden of enterprises to a greater extent, allowing enterprises to have more disposable surplus to increase R&D expenditure. Ivus Olenajose Manu, Sharma Ruchi, et al. (2021) conducted an empirical analysis on the enterprise-level data of Indian private companies from 2001 to 2016 using the double difference model DID, and the results showed that the R&D tax credit policy led to a sharp increase in R&D expenditure, R&D intensity, and the number of patent applications, indicating that the implementation of preferential tax policies can significantly motivate enterprises to carry out innovative R&D activities.

However, there are also other streams found that there is a non-positive or negative relationship between tax incentives and enterprise R&D investment. Li Yanyan and Wang Kun (2016) conducted study on China's A-share listed firms and discovered that tax incentives had an effective promotion impact, but the impact on corporate R&D activities is not significant. According to Thomson (2010)'s research, who used 500 Australian firms as its research subject and examined data from 1995 to 2005, tax incentives did not significantly influence corporate R&D spending. In the study by Lin Zhouyu et al. (2013), the degree of tax incentives and the intensity of business technological innovation are correlated in an inverted U pattern. Tax incentives can greatly encourage innovation when their intensity is lower than the crucial value, and when it is higher than the critical value, taxes will stifle it.

Only a few studies have been conducted to specifically focus on Chinese digital firms' R&D investment encouraged by cooperative income tax advantages, despite the fact that each of these streams provides significant and distinctive additions to the literature on how tax incentives impact the R&D investment of enterprises. According to study by Xu Jianbin (2022) using data from publicly traded firms from 2012 to 2020 and a two-way fixed effect model, China's corporate income tax favorable policies have greatly boosted the R&D expenditure of enterprises in the digital economy. Using the digital economy companies in Shenzhen from 2017 to 2020 as a research sample, Shen Si et al. (2021) discovered that the tax and fee reduction strategy considerably boosted the R&D investment of digital companies. However, this study samples used in this literature are not typical and solely consider digital economy businesses in Shenzhen.

Considering what has been discussed so far, this study fills in a number of gaps in the literature about the influence of tax incentives on R&D investment. It starts by using a straightforward yet sophisticated modeling estimator to analyze data using static and dynamic panel data models. Second, rather than choosing randomly all high-tech businesses for inquiry, this study picks the digital economy industry for focused research based on the most recent defining document of the sector. Thirdly, this study categorizes and compares the effects of tax incentives on R&D investment in three significant but unstudied industries.

## METHODOLOGY

### Variables and Data Description

As previously stated, the research objective of this paper is to investigate the response of R&D expenditure of digital economy enterprises to corporate income tax incentives. The research sample is China's A-share listed digital economy companies from 2012 to 2021. The source data mostly originate from the Wind database and the Guotaian China Economic and Financial Research Database (CSMAR). Due to the insufficient publication of R&D spending data of listed businesses prior to 2012, the sample

in this study is intercepted as data after 2012 (Long Xiaoning et al., 2018). The key industries of the digital economy mainly include computer communications, other electronic equipment manufacturing, telecommunications, Internet, software, information technology services and other industries. In view of the importance of the core industry of the digital economy and the availability of data, this study selects about 800 Chinese A-share listed companies in the core industry of the digital economy as the specific research objects on the basis of eliminating abnormal samples such as ST enterprises.

The dependent variable of this study is enterprise R&D expenditure. In view of the availability and completeness of data, and drawing on the practice of existing literature (Liu Shiyuan et al., 2020), in order to determine the degree of enterprise R&D investment, this study calculates enterprise R&D intensity, or the ratio of enterprise R&D spending to operating revenue.

In terms of independent variable: Although there are various forms of favorable tax treatment for corporations for R&D expenditure in digital economy enterprises, they are comprehensively reflected in the reduction of the actual tax rate of corporate income tax (Yang Guochao et al., 2017). Therefore, this study uses the actual corporate income tax rate to measure corporate income tax incentives (Porcano, 1986). Where: Actual tax rate = (Income Tax Expense - Deferred Income Tax Expense) / EBIT. In order to reduce the estimation bias caused by omitted variables, this study controls a series of characteristic variables that affect enterprises' R&D expenditure in the regression equation referring to the practice of existing research (Feng Genfu et al., 2021), including enterprise size, asset-liability ratio, ratio of current assets to total assets, return on assets and enterprise growth.

**TABLE 1:** The variables of regression

Variable Category	Variable Name	Variable Interpretation
Dependent Variable	R&D investment	The R&D intensity of enterprises is used to measure the level of enterprise R&D investment, that is, the ratio of enterprise R&D spending to operating revenue is used to measure the level of enterprise R&D investment.
Independent Variable	Corporate income tax burden	The corporate income tax benefit is measured by the difference between the statutory tax rate and the effective tax burden rate. Actual tax burden rate = income tax expense payable ÷ (total pre-tax profit - deferred tax expense ÷ legal tax rate).
Control Variables	Size of Enterprise (Size)	Logarithm of Assets = $\ln(\text{Total Assets})$
	Asset-liability ratio (ALR)	Asset-liability ratio = Total Liabilities / Total Assets
	Current Assets Ratio (CAR)	Current Assets Ratio = Current Assets / Total Assets
	Return on assets (Return)	Return on assets = Net profit / Total Assets
	Business growth (Growth)	Business growth is measured by the growth rate of operating revenue.

**Estimation Strategies**

The estimation was performed using a panel data analysis, and the data format consists of non-balanced data for around 800 enterprises (N) across a 10-year period from 2012 to 2021 (T). This study will assess the effect of corporate income tax on R&D investment using static and dynamic panel data regression models.

## Static Panel Model

The Pooled Ordinary Least Square (POLS), Fixed Effects Model (FEM), and Random Effects Model (REM) are the three rival formulations used to model static panel data. In the pooled model (POLS), it is assumed that the error term and the explanatory variables have no association, or correlation ( $\varepsilon_{it}, X_{it}$ ) = 0. Without taking into account any cross-sectional or temporal effects, the pooled model may be estimated using the usual OLS method (homogeneity across units). With contrast, the fixed effects regression model is employed with panel data to calculate the impact of unique inherent characteristics. Such intrinsic attributes include things like genetics, IQ, and cultural factors. Even if it is impossible to directly witness or test these factors, it is nonetheless important to consider their effects because if they are not taken into account, a regression model cannot be trained to its fullest extent. As a result, the fixed effects model is designed to address this problem. This model's underlying premise is that the explanatory factors exhibit a correlation with firm-specific effects, or correlation ( $\alpha_i, X_i$ )  $\neq 0$ , and are now a component of the constant (intercept), in which they are time-invariant. Either the first difference transformation, which eliminates the particular effects, or the estimator, which devalues all variables, can be used to estimate the FE model. The OLS technique will then be employed using the altered model after subtracting each mean value from each observation in this approach.

The REM has assumed that the firm-specific effect ( $i$ ) has no relation with the explanatory variables, or correlation ( $\alpha_i, X_i$ ) = 0, in contrast to POLS and FEM. However, if OLS is used, the random effect model (REM) will be influenced by autocorrelation since the standard error is inaccurate, rendering a conventional OLS estimation ineffective. REM will be estimated using GLS in order to develop a modified OLS model based on a weighted average of within- and between-variation data. To assess whether a fixed effect model or random effect model is more suited, we will utilize the Hausman Test. In order to use this test, we must estimate both the fixed effect model and the random effect model firstly, and then use the Hausman statistic to compare the calculated coefficients. The favored model, as opposed to fixed effects, is random, according to the null hypothesis that there is no correlation between the unique mistakes and the regressors.

Accordingly, the study's model will be demonstrated as follows:

$$RD_{it} = \beta_0 + \beta_1 TAX_{it} + \beta_2 SIZE_{it} + \beta_3 ALR_{it} + \beta_4 CAR_{it} + \beta_5 RETURN_{it} + \beta_6 GROWTH_{it} + \lambda_i + \varepsilon_{it} \quad (1)$$

In Eq.(1), RD is digital companies' R&D investment, TAX is the actual corporate income tax burden, SIZE is asset scale, ALR is asset-liability ratio, CAR is current assets ratio, Return is return on assets, Growth is the growth rate of operating revenue. The symbol  $\beta_0$  is defined as constant,  $\beta_1, \dots, \beta_6$  are the coefficients for each explanatory variable,  $\lambda_i$  represent individual effect and  $\varepsilon_{it}$  is the overall error term,  $i$  represents the company and  $t$  is the time series.

## Dynamic Panel GMM Estimation

Due to different endogeneity problems, the static panel, or the fixed and random effects estimator, may produce biased and inconsistent values. As a result, the GMM approach has been used to provide parameters that are more consistent (Bun & Sarafidis, 2013). After the lagged dependent variable is incorporated into the model, the static panel estimate is no longer effective. The following factors were accepted as the dynamic model's R&D investment determinants:

$$RD_{it} = \beta_0 + \alpha RD_{i,t-1} + \beta_1 TAX_{it} + \beta_2 SIZE_{it} + \beta_3 ALR_{it} + \beta_4 CAR_{it} + \beta_5 RETURN_{it} + \beta_6 GROWTH_{it} + \lambda_i + \varepsilon_{it} \quad (2)$$

Among them:  $i$  and  $t$  represent the individual and year of the enterprise respectively; the explained variable RD represents the enterprise R&D expenditure; the explanatory variable TAX represents the actual corporate income tax burden;  $\lambda_i$  is the firm-specific effect (that captures the individual heterogeneity) and  $\varepsilon_{it}$  is the disturbance.

Two sources of persistence across time define the dynamic panel data regression in equation (2). The first is autocorrelation brought on by the lagged dependent variable  $RD_{i,t-1}$ , which is reliant on the firm's particular effect ( $\lambda_i$ ). This association causes bias in the estimate of this dynamic panel in equation (2) (Nickell, 1981). When  $T$  grows too big or gets close to infinity, it will eventually vanish. The second is individual effects (unobserved company-specific effects) that describe the firm heterogeneity. The so-called dynamic panel estimation bias problem is caused by the fact that the OLS, fixed effect, and random effect estimators employed in static panel model estimation are all biased and inconsistent.

The GMM (Generalized technique of Moments) estimate technique, sometimes referred to as generalized moment estimation, is a generalization of the moment estimation approach and is based on the real model parameters that meet particular moment requirements. It is always feasible to identify a number of moment requirements that the model's real parameters fulfill and utilize GMM estimation as long as the model is configured properly. Ordinary least squares, instrumental variables, and maximum likelihood are examples of conventional econometric estimating techniques that have drawbacks. In other words, when specific conditions are met, such as when the random error component of the model follows a normal distribution or a specific known distribution, their parameter estimations must be trustworthy.

In a dynamic panel data model, the lagged terms of the dependent variable are utilized as explanatory variables, and the model has cross-sectional dependency, which may lead the explanatory variables to be associated with the random disturbance terms. Because of this, using typical estimating techniques will inevitably result in estimations of the parameters that are inconsistent and biased, which will affect the conclusions about the economic consequences of the parameters. Arellano and Bond (1991) and Blundell and Bond (1998) suggested GMM estimate to handle the aforementioned circumstances and effectively resolve the aforementioned issues.

Anderson and Haiso (1982) developed the first technique to derive coefficient consistency estimates for dynamic panel data models, which was calculated by adding instrumental variables to the first-order differenced dynamic panel model. Although the random error term  $v$  of the original model itself is not serially correlated,  $v$  in the differenced model is autocorrelated, and the structure of the random error term is not taken into account in the estimation, and its estimator is not valid, this method is invalid because it does not use more valid instrumental variables and because the original model is differenced. Arellano and Bond (1991) introduced the first-order difference estimation approach to the estimation of kinetic panel data, and the problem of biased estimates was considerably improved as a result of the widespread use of the GMM method established by Hansen (1982) in econometric analysis. The addition of extra instrumental variables and the use of GMM estimating techniques that take into consideration the error term's structure make Anderson and Haiso's method more efficient as well. The degree of bias of the estimators, however, considerably rises when the issue of weak instrumental variables is present. By introducing assumptions, Blundell and Bond (1998) provided a systematic GMM estimate based on Arellano and Bover (1995). The method uses more information than the first-order difference estimator, has better finite sample properties than the first-order difference estimator, and significantly lowers the estimator's bias because it includes both the difference equation with the lagged level variable as the instrumental variable and the level equation with the lagged difference variable as the instrumental variable. There are one-step and two-step approaches for system GMM estimation. Two-step estimation is more accurate than one-step estimation when heteroskedasticity or autocorrelation are present in the panel data, hence in this paper the two-step system GMM estimation method is utilized, with the one-step GMM approach being used as a robustness test.

Blundell and Bond (1998) suggested two specification tests to validate the system GMM's estimation findings after the system estimated the data by an over-identification test and a serial correlation test. First of all, the validity of instrumental variables is examined using the over-identification test, which operates on the presumption that all instrumental factors are exogenous. The Sargan's test and the Hansen's test are two techniques for evaluating the homogeneity of instrumental variables. While the Hansen test is more general in its applicability and more robust to random disturbances, the Sargan test fails when heteroskedasticity or autocorrelation of random disturbances are present. The Hansen test is thus employed to confirm the reliability of instrumental variables. The second test is the serial correlation test for the disturbances (Arellano and Bond, 1991). The GMM results are inconclusive if the randomly perturbed terms exhibit autocorrelation, and the serial

correlation must be confirmed. First-order autocorrelation, but not higher-order or second-order autocorrelation, can exist in the system GMM for the random perturbation term following one difference. Instead than rejecting the null of the absence of the first-order serial correlation (AR1), it should reject the lack of the second-order serial correlation (AR2).

## RESULTS AND DISCUSSION

### Total Sample Analysis

The estimation findings for the effect of corporate income tax incentives on R&D investment are summarized in Table 2 utilizing static panel models (column 1,2,3) and dynamic panel system GMM estimation (column 4). The OLS model is ruled out in favor of FEM based on the findings of the Breusch and Pagan Lagrange Multiplier test. Additionally, the Hausman test, which is employed in panel analysis to distinguish between FEM and REM, shows that FEM is more suitable. The lagged dependent variable is significant in the system GMM estimation, as displayed in the column. The p-values produced by executing a first-order or second-order serial correlation test on the residual after the first-order difference of the original model, respectively, are represented by the AR(1) p-value and AR(2) p-value. There is no serial correlation in the residuals, as shown by  $AR(1) < 0.1$  and  $AR(2) > 0.1$ . The Hansen test is used to determine whether the instrumental variable has an issue with over-identification. A P value greater than 0.1 indicates that the null hypothesis is accepted, that is, the instrumental variable is valid and there is no over-identification problem. Therefore, dynamic system GMM is adequate for interpreting the findings.

**TABLE 2.** The impact of corporate income tax incentives on digital companies' R&D investment (whole sample)

Explanatory Variables	Static Model			Dynamic Model
	(1)OLS	(2)FE	(3)RE	(4)System GMM (two-step)
Lag of R&D	-	-	-	0.7502*** (0.0923)
TAX	-0.0367*** (0.0051)	-0.0072*** (0.0023)	-0.0101*** (0.0023)	-0.0063* (0.0149)
SIZE	0.0028* (0.0016)	0.0048*** (0.0009)	0.0044*** (0.0008)	0.0136* (0.0129)
ALR	-0.1231*** (0.0114)	-0.0402*** (0.0050)	-0.0553*** (0.0044)	-0.0721 (0.0921)
CAR	0.0280*** (0.0095)	-0.0223*** (0.0048)	-0.0104** (0.0045)	0.0341 (0.1238)
Return	-0.0693*** (0.0161)	-0.0627*** (0.0042)	-0.0653*** (0.0042)	-0.0611 (0.0780)
Growth	-0.0002*** (0.0001)	-0.0002 (0.0002)	-0.0003** (0.0001)	-0.0045* (0.0017)
Constant	0.0586 (0.0361)	0.0163 (0.0198)	0.0271 (0.0185)	-0.2653 (0.3264)
AR(1)	-	-	-	0.000
AR(2)	-	-	-	0.933
Observations	5948	5948	5948	5948



Number of groups	-	958	958	958
Number of instruments	-	-	-	39
R-squared	0.1176	0.058	0.062	-
Breusch-Pagan LM test	0.0000***	-	-	-
Hausman test	-	0.0000	-	-
Serial Correlation (F-stat)	-	51.152	-	-
Hansen test	-	-	-	0.578

z-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The corporate income tax burden coefficient is significant and has negative effect on R&D investment. In FEM, a unit increase in the actual tax rate in digital companies decreased R&D investment by 0.0072%, this negative affecting result is consistent with the system GMM estimation. Past studies have also found similar results, which indicated that tax incentive has a significant impact on R&D expenditure (Shen Si, 2021; Zhouke Qing, 2012). This indicates that R&D investment in enterprises involved in the digital economy has been significantly boosted by China's present corporate income tax preferred policies, which primarily comprise low tax rates and a super deduction for R&D costs. As can be observed, the enterprise income tax benefits reduce the expenses associated with R&D, which in turn effectively corrects, to a certain extent, the market failure of R&D investment in businesses engaged in the digital economy.

The size of the digital company, which is measured by the company's total assets, also significantly influences R&D investment. In FEM, a 1% increase in the size of the company leads to an increase in R&D investment spending by 0.0048% at the 1% significance level, while it increased by 0.0136% at the 10% significance level using the system GMM. This is mainly because the larger the firm, the more funds are available for R&D spending. Regarding the return on assets, this variable showed a sizable positive association with R&D spending, suggesting that R&D spending is higher in businesses that are more successful. Additionally, at the level of 1% significance, the previous firm-level R&D investment has a favorable and statistically significant impact on the current firm-level R&D investment. An increase of one percentage point (1%) in firm-level R&D investment from the prior year resulted in a rise of 0.75% in current firm R&D expenditures.

### Sample Splitting According to Industries

The aforementioned regression primarily examines the overall impact of the corporate income tax burden on the R&D expenditures of businesses engaged in the digital economy. Additionally, as mentioned above, the core industries of the digital economy include three major categories of industries in the classification of national economic industries: computer and other electronic equipment manufacturing, software and information technology services, and Internet and telecommunications broadcasting. Enterprises in different industries enjoy different preferential tax policies, which may lead to different suppression of corporate income tax burden on R&D investment. In order to verify the heterogeneity effect, this paper further carried out regression analysis by industry. Table 3 provides an overview of the key empirical findings. Only the dynamic panel data were utilized for the study since the lagged dependent variable in the system GMM is significant in each of the three industries.

**TABLE 3.** Corporate income tax incentives' effects on digital enterprises' R&D spending (sample splitting by industry)

Variables	Computer and other electronic equipment manufacturing	Software and information technology services	Internet and telecommunications broadcasting
Lag of R&D	0.6201*** (0.0876)	0.5494*** (0.0840)	0.8306*** (0.0996)
TAX	-0.0118* (0.0067)	-0.0237* (0.0138)	-0.0435* (0.0256)
SIZE	0.0035 (0.0049)	0.0256*** (0.0092)	0.0064 (0.0075)
ALR	-0.0445** (0.0205)	-0.4153*** (0.0622)	-0.0356*** (0.0126)
CAR	-0.1522** (0.0693)	0.0073 (0.0714)	0.0081 (0.0183)
Return	-0.0118 (0.0429)	-0.1040* (0.0558)	-0.0381** (0.0148)
Growth	-0.0205 (0.0027)	-0.0998*** (0.0238)	-0.0094*** (0.0022)
Constant	0.0732 (0.1672)	-0.3393 (0.2230)	-0.1169 (0.1760)
AR(1)	0.048	0.005	0.000
AR(2)	0.566	0.556	0.458
Observations	2520	1563	445
Number of groups	456	278	85
Number of instruments	39	56	41
Hansen test	0.578	0.258	0.811

z-statistics in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

The findings showed that, at the 10% level of significance, the tax burden brought on by different industries' preferential corporate income tax policies had a considerable effect on digital companies' R&D spending. In the Internet and telecoms broadcasting business, corporate income tax incentives have the most influence on companies' R&D intensity, followed by software and information technology services, the computer and other electronic equipment manufacturing industries are least affected by the increase in the tax burden. For every percentage increase in the tax burden, the R&D expenditures of the three industries are reduced by 0.0435, 0.0237, and 0.0118 respectively. As for the reasons, compared with the computer and electronic equipment manufacturing industry, the Internet and telecommunications broadcasting industry is a "high-tech" industry, and products and technologies are updated quickly. By assuming certain R&D risks, enterprises may obtain huge profits brought by new technologies and products. Therefore, affected by external competitive pressures and internal profit-seeking motives, enterprises in this industry may be more willing to spend more of the savings brought about by tax incentives on R&D activities, resulting in higher R&D investment intensity.

The results of the regression by industry are consistent with the results of the overall regression, and the results also reveal that the company's big R&D investment in the present period is significantly

influenced by its R&D expenditure in the previous period. The R&D expenditure of businesses will climb by 0.7502 percentage points for every percentage point increase in R&D spending during the prior quarter. With the Internet sector having the largest impact, there will be a gain in the Internet sector of 0.8306 percentage points and a minimal rise in the software sector of 0.5494 percentage points.

**Robustness Checks**

The dynamic panel model in Equation (2) was re-estimated using different methods, including system GMM estimation (one-step) and difference GMM (one-step and two-step estimation). In general, the main findings of the robustness exams is constant with the two-system system GMM. For example, if the tax burden increases by 1%, the enterprise R&D expenditure will decrease by 0.0115 in the difference GMM one-step estimation, in the difference GMM two-step estimation, the enterprise R&D expenditure will decrease by 0.0109; and in the one-step system GMM estimation, the enterprise R&D spending will decrease by 0.0045.

**TABLE 3** Corporate income tax incentives' effects on digital enterprises' R&D spending (other estimations)

Variables	Difference GMM estimation (one-step )	Difference GMM estimation (two-step)	System GMM estimation (one-step )
Lag of R&D	0.5863***	0.4908***	0.6998***
	(0.0652)	(0.1277)	(0.0359)
TAX	-0.0115**	-0.0109*	-0.0045*
	(0.0058)	(0.0062)	(0.0025)
SIZE	-0.0057	-0.0051	0.0086*
	(0.0039)	(0.0108)	(0.0052)
ALR	0.0240	0.0416	-0.0224
	0.0335	(0.0608)	(0.0402)
CAR	-0.0175**	-0.0271	-0.0268
	(0.0079)	(0.0789)	(0.0462)
Return	-0.0418***	-0.0325*	-0.0422**
	(0.0120)	(0.0190)	(0.1922)
Growth	-0.0002	-0.0044**	-0.0040***
	(0.0018)	(0.0020)	(0.0004)
AR(1)	0.000	0.001	0,000
AR(2)	0.966	0.704	0.903
Number of observations	4045	3280	4938
Number of groups	753	671	871
Number of instruments	40	54	39
Hansen test	-	0.705	-

**CONCLUSION**

The digital economy is a brand-new economic structure that significantly demonstrates the nation's overall strength in the digital era. The favourable corporate income tax laws that encourage the R&D

investment of digital economy businesses must be significantly improved if China's digital industry is to constantly increase its competitiveness and impact.

The government should enforce a greater degree of regulation regarding research and development spending deductions. The results of the study show how the advantageous corporate income tax policy has a significant incentive effect on the R&D spending of enterprises involved in the digital economy. Enterprises in the digital economy invest more in R&D the more tax incentives there are. R&D investment is the core link in the innovation and development of digital economy enterprises. For enterprises operating in the digital economy, a more aggressive R&D expense deduction policy can be enacted to further reduce their R&D expenses and maximize the innovation-inducing effects of favourable corporate income tax regulations. This will encourage these businesses to increase their R&D investment. For example, the super deduction ratio of R&D expenses for digital economy enterprises can be increased from the current 100% to 150% or 200%, so as to further encourage digital economy enterprises to increase R&D investment.

The research's findings show that the industry a company belongs to has an impact on the degree to which the current preferential tax laws have an impact on their R&D operations. Therefore, the development of the industry to which the business belongs should adopt particular tax preference regulations to encourage the balanced growth of varied sectors.

The scope of favourable corporate income tax rates must likewise be increased. The findings of this study's empirical research demonstrate that preferential corporate income tax policies with low tax rates as its primary component have greatly boosted the R&D expenditures of businesses engaged in the digital economy. This demonstrates how the present preferential corporate income tax rate has successfully encouraged digital economy businesses to engage in R&D. The government can increase incentives for digital economy businesses to invest in R&D and enhance the technological innovation capabilities of digital economy businesses by extending the preferential corporate income tax rate (15%) for high-tech enterprise-qualified digital economy businesses to all businesses that are included in the core sectors of the digital economy.

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## **ISU KEMISKINAN DIGITAL DALAM KALANGAN PENDIDIK LUAR BANDAR DI NEGERI KEDAH**

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### **ABSTRAK**

*Dalam era revolusi industri 4.0, kemiskinan digital dalam pendidikan telah muncul sebagai cabaran kritikal. Kemiskinan digital merujuk kepada kekurangan akses kepada teknologi digital dan capaian internet, serta menghalang keupayaan pelajar dan pendidik untuk mengambil bahagian sepenuhnya dalam pembelajaran dalam talian. Menangani kemiskinan digital dalam pendidikan bukan sahaja penting untuk memastikan akses yang inklusif dan saksama kepada pendidikan berkualiti tetapi juga memainkan peranan penting dalam memacu kesiapsiagaan negara dalam mendepani era pembelajaran digital. Hasil temu bual beberapa orang informan (pendidik) mendapati para informan luar bandar di negeri Kedah berhadapan dengan ciri-ciri kemiskinan digital yang mana mereka mengalami kesukaran untuk mengendalikan pembelajaran secara dalam talian. Artikel ini juga akan mengupas beberapa faktor yang menjadi penghalang kepada informan pendidik sekolah luar bandar untuk menyertai P&P atas talian, seterusnya kesannya terhadap daya tahan, keterangkuman dan impak jangka panjang kemiskinan digital dalam sektor pendidikan.*

*Kata kunci: kemiskinan digital, pembelajaran atas talian, pembelajaran digital*

### **ABSTRACT**

*In the era of industrial revolution 4.0, digital poverty in education has emerged as a critical challenge. Digital poverty refers to the lack of access to digital technology and internet access, and hinders the ability of students and educators to fully participate in online learning. Addressing digital poverty in education is not only important to ensure inclusive and equitable access to quality education but also plays an important role in driving the country's preparedness in facing the era of digital learning. The interview results of several informant's educators) found that rural informants in the state of Kedah are faced with the characteristics of digital poverty where they experience difficulties in using technology in T&L. This article examines some of the factors that hinder rural informants from participating in online T&L, then their impact on resilience, inclusion and then the long-term impact of digital poverty in the education sector.*

*Keywords: digital poverty, online learning, digital learning*

## **PENGENALAN**

Kemiskinan digital merupakan isu penting untuk dibincangkan kerana ia memberi kesan kepada sejumlah besar individu dan komuniti di seluruh dunia (Nur Firzana & Kee Y. Sabariah, 2022). Memandangkan teknologi maklumat dan komunikasi (ICT) terus memainkan peranan yang semakin penting dalam banyak aspek kehidupan seharian, mereka yang tidak dapat mengakses atau menggunakan teknologi ini secara berkesan berisiko ketinggalan dari segi peluang ekonomi, sosial mahupun pendidikan. Ini boleh menyumbang kepada masalah jurang digital yang makin meluas dalam kalangan masyarakat. Masalah ini juga akan memburukkan ketidaksamaan sosial dan ekonomi yang sedia ada.

Pandemik Covid-19 yang berlaku pada penghujung tahun 2019 telah meningkatkan pergantungan masyarakat terhadap penggunaan teknologi ICT kerana batasan dalam interaksi dan komunikasi secara bersemuka (Yakin et al., 2021). Dalam era pasca pandemik hari ini, teknologi khususnya ICT dilihat sebagai alat yang penting dan perlu untuk memenuhi tugas harian, menjalankan aktiviti ekonomi, dan bersosial. Situasi ini juga didorong oleh perubahan pesat dalam penggunaan teknologi dalam kalangan industri besar dan sederhana impak dari Revolusi Perindustrian Keempat (IR4.0) (Hazura & Hairulliza, 2012). Oleh itu, pengetahuan ICT dilihat sangat relevan dan penting dalam pembangunan dan kemajuan masyarakat dan individu ke arah masa depan yang lebih baik (Ishak & Yamin, 2019).

Dalam bidang pendidikan ICT menyokong proses teras dalam pengurusan dan pentadbiran pendidikan, pengajaran dan pembelajaran (PdP) serta pembelajaran sepanjang hayat. ICT memainkan peranan besar dalam pelbagai aspek terutama dari aspek capaian ke atas maklumat, jaringan komunikasi dan inovasi dalam pengajaran (Surjono, 2013). Contoh inovasi dalam pengajaran termasuklah gamifikasi bagi menarik minat pelajar terhadap pembelajaran (Ishak & Yamin, 2020). Sepanjang pandemic Covid-19, ICT telah menjadi sebahagian daripada alatan terpenting bagi menjamin kelangsungan pendidikan di Malaysia iaitu melalui PdP dalam talian. Walau bagaimanapun, keterbatasan pemilikan, capaian dan pengetahuan ICT dalam masyarakat sepanjang pandemik menyebabkan ramai pendidik dan pelajar tercicir dalam PdP terutama di kawasan luar bandar.

Artikel ini mengupas isu kemiskinan digital serta faktor-faktor yang menjadi penghalang kepada para pendidik dalam meneruskan pembelajaran secara dalam talian. Selain pelajar, para pendidik amnya terkesan dengan senario ini. Malah kesannya memberikan dampak hebat dalam dunia pendidikan. Masakan tidak, seandainya para pendidik yang ketinggalan secara total dalam arus digital, ini akan memberikan impak dahsyat sekali. Oleh itu, objektif utama artikel ini adalah untuk membincangkan dan berkongsi dapatan kajian sejauh mana isu kemiskinan digital dalam kalangan pendidik sekolah luar bandar serta faktor-faktor yang menghalangi mereka untuk berdepan dengan era transformasi teknologi dalam dunia pendidikan.

## **CIRI-CIRI KEMISKINAN DIGITAL**

Konsep kemiskinan digital telah dipopularkan oleh Barrantes (2007). Barrantes mentakrifkan kemiskinan digital sebagai kekurangan akses kepada ICT yang mungkin menjadi ciri-ciri segmen penduduk, sama ada ia berpunca daripada kemiskinan ekonomi atau faktor-faktor lain yang menyumbang kepadanya akan menyebabkan mereka sukar untuk menggunakan teknologi. Kemiskinan digital dibahagikan kepada empat tahap utama iaitu (Jadual 1);

- Peringkat Pertama: Pada peringkat ini, individu tersebut berpendapatan rendah atau berada dalam keadaan ekonomi yang lemah. Mereka juga menghadapi pelbagai halangan yang menghalang mereka daripada menggunakan Teknologi Maklumat dan Komunikasi (ICT), walaupun dalam skala yang minimum.

- Peringkat Kedua: Pada peringkat ini, individu tersebut juga berpendapatan rendah atau berada dalam keadaan ekonomi yang lemah. Namun begitu, mereka mempunyai pengetahuan dan kemahiran dalam menggunakan ICT. Ini bermakna walaupun mereka miskin, mereka mampu menggunakan ICT untuk beberapa tujuan, seperti mengakses internet, menggunakan aplikasi, atau berkomunikasi melalui media sosial.
- Peringkat Tiga: Pada peringkat ini, individu tersebut miskin dari segi ekonomi, tetapi mempunyai pengetahuan dan kemahiran menggunakan ICT. Walaupun mereka mempunyai keupayaan untuk menggunakan teknologi itu, mereka memilih untuk tidak menggunakannya. Alasan mereka mungkin berbeza-beza, seperti kurang minat, keutamaan kepada cara berkomunikasi tradisional, atau pertimbangan peribadi.
- Peringkat Empat: Pada peringkat ini, individu tersebut tidak miskin dari segi ekonomi dan berasa tidak perlu menggunakan ICT. Walaupun mereka mempunyai akses dan keupayaan untuk menggunakan teknologi ini, mereka mungkin tidak berbuat demikian kerana mereka tidak melihat manfaat yang cukup besar atau mereka mempunyai pilihan yang berbeza dalam menjalani kehidupan seharian mereka.

**JADUAL 1.** Ciri-ciri kemiskinan digital

	<b>Tahap</b>	<b>Penjelasan</b>
Jenis kemiskinan secara digital	Satu	Berpendapatan rendah atau ekonomi individu miskin dan menghadapi pelbagai halangan yang menghalang mereka daripada menggunakan ICT walaupun ianya minimum.
	Dua	Pendapatan rendah atau ekonomi individu miskin tetapi mempunyai pengetahuan dan kemahiran dalam menggunakan ICT
	Tiga	Individu yang miskin dari segi ekonomi dan tidak mahu menggunakan ICT walaupun mempunyai pengetahuan dan kemahiran
	Empat	Individu tidak miskin dari segi ekonomi dan berasa tidak perlu menggunakan ICT

Secara kesimpulannya, Barrantes (2007) turut menekankan bahawa kemiskinan digital bukan hanya diukur melalui kemiskinan ekonomi semata-mata tetapi diukur melalui keinginan/kesungguhan individu untuk menggunakan teknologi dalam urusan mereka.

## **METODOLOGI KAJIAN**

Kajian ini telah dijalankan di sebuah sekolah luar bandar di daerah Sik, Kedah sebagai kawasan kajian. Pendekatan kualitatif telah digunakan dalam kajian ini dengan mengadakan temu bual secara bersemuka terhadap informan iaitu guru sekolah. Penyelidikan ini menggunakan teknik pensampelan bertujuan, oleh itu untuk mendapatkan informan, penyelidik telah menghubungi Jabatan Pendidikan Negeri Kedah (JPNK). Pihak JPNK telah memilih sebuah sekolah luar bandar di daerah Sik. Seterusnya, pihak pengurusan sekolah memilih tiga orang guru sebagai informan. Ketiga-tiga guru ditemu bual secara berstruktur.

Analisis tematik telah digunakan untuk menganalisis data yang telah dikumpulkan, data tersebut disusun menjadi tema berkaitan dengan sub-pertanyaan untuk dianalisis. Semasa proses mengumpulkan data, penyelidik juga telah mengikuti prinsip dan prosedur beretika dalam menjalankan kajian. Menurut Bryman (2012) etika penyelidikan dapat ditakrifkan sebagai prinsip yang membimbing penyelidikan, dari awal hingga akhir kajian. Justeru itu, sebelum temu bual dijalankan penyelidik telah menerangkan kepada informan tujuan penyelidikan dijalankan. Selepas mendapat kebenaran daripada informan, barulah penyelidik menemu bual mereka. Informan turut dimaklumkan bahawa sumber maklumat yang diberikan akan dipastikan kerahsiaannya dan hanya untuk tujuan penyelidikan sahaja.



## DAPATAN DAN PERBINCANGAN KAJIAN

Pada bahagian ini, penyelidik akan menunjukkan profil informan yang telah di temu bual agar dapat memberi gambaran awal berkaitan mata pelajaran, umur serta teknologi yang telah diaplikasikan sewaktu pembelajaran secara dalam talian sepanjang PKP.

**JADUAL 2.** Profil informan kajian

Nama	Kod	Mata pelajaran	Umur	Jantina	Kaedah pengajaran dalam talian
Informan 1	R1	Sains dan PJK	40 tahun	Lelaki	WhatsApp
Informan 2	R2	Sains dan Bahasa Inggeris	33 tahun	Perempuan	WhatsApp
Informan 3	R3	Pendidikan Islam	51 tahun	Perempuan	WhatsApp

Berdasarkan Jadual 2 di atas, ketiga-tiga informan yang telah ditemu bual oleh penyelidik adalah para guru sekolah iaitu guru yang mengajar di salah sebuah sekolah luar bandar daerah Sik, Kedah. Informan pertama (R1) merupakan seorang lelaki, berumur 40 tahun dan mengajar mata pelajaran Sains dan PJK. Sepanjang pembelajaran dalam talian dilaksanakan, R1 hanya menggunakan kaedah aplikasi WhatsApp sahaja. Tambahan pula, pada waktu tersebut, beliau baru ditugaskan ke sekolah tersebut. Ini amat menyukarkan beliau dalam mengendalikan kelas.

Informan 2 (R2) merupakan seorang wanita berusia 33 tahun, berasal dari Sik Kedah. Sepanjang tempoh PKP, beliau hanya menggunakan aplikasi WhatsApp sahaja kerana tidak mempunyai alternatif lain untuk mengajar sewaktu itu. Manakala informan 3 (R3) yang juga merupakan seorang wanita berumur 51 tahun juga mengajar menggunakan platform WhatsApp juga.

Untuk mengenal pasti ciri-ciri kemiskinan digital yang dihadapi oleh para pendidik sekolah luar bandar, akan dibincangkan pada bahagian tema 1.

### ***Tema 1: ciri-ciri kemiskinan digital yang di hadapi oleh pendidik sekolah luar bandar***

Kemiskinan ekonomi bukanlah satu faktor utama dalam mengukur kemiskinan digital. Dalam tema ini, para penyelidik telah menanyakan jenis peranti yang dimiliki dan digunakan sewaktu pembelajaran dalam talian oleh para informan. Hasil temubual, ketiga-tiga informan tiada masalah dari segi pemilikan peranti teknologi.

*“Ada semua, printer lengkap”*

R2

*“Saya banyak guna telefon”*

R3

Berdasarkan kepada hasil analisis temubual yang telah dijalankan ke atas ketiga-tiga informan, jelas menunjukkan bahawa mereka bukanlah golongan individu miskin ataupun berpendapatan rendah. Ini kerana ketiga-tiga informan mampu membeli peranti teknologi dan memiliki data internet. Akan tetapi, jelas terpancar di wajah mereka, mereka tidak berpuas hati dengan pembelajaran secara dalam talian, bukan kerana tidak mahu menyokong pengendalian kelas secara dalam talian, tetapi perasaan “tidak puas” atau “tiada roh” membelenggui jiwa mereka sebagai seorang pendidik, yang inginkan seratus peratus para pelajar mereka memahami setiap apa yang mereka pelajari;

*“kalau bagi saya memang tidak selesa”*

R1

*“tak sangat sebab dia bukan dua hala kan...jadi susah kita nak tengok pencapaian budak. Kita tak tahu dia buat atau tidak sebenarnya untuk latihan”*

R2

*“Saya rasa, nak kata kecewa tu tidak la sebab kita tahu murid pun mengalami masalah kan. Cuma saya rasa macam sukar untuk mengajar sewaktu online, kalau bersemuka kita boleh tengok reaksi mereka dan sebagainya. Bila online ni, contohnya murid menghantar kerja mereka dengan tangkap gambar dan hantar di Whatsapp, bukan senang untuk kita tengok. Kita juga risau sama ada murid tu faham atau tidak, dapat bimbingan daripada ibubapa ataupun tidak”*

R3

Namun begitu, ketiga-tiga informan berusaha gigih dan bersungguh-sungguh untuk merealisasikan pembelajaran atas talian walaupun hanya menggunakan teknologi untuk pengajaran yang amat terhad seperti aplikasi WhatsApp.

*“Secara Whatsap je la. Satu sebab faktor line, masalah waktu tu. Kalau ikutkan suggestion daripada pihak sekolah memang macam-macam la kan. Tetapi, kawasan ni yang paling sesuai sekali Whatsap la”*

R1

*“Saya guna hotspot. Guna daripada telefon sebab rumah saya tidak boleh memasang WiFi sebab kawasan. Saya dah telefon celcom apa semua tetapi mereka kata tempat saya tu macam tak boleh”*

R3

Kesimpulannya, untuk tema pertama, untuk ciri-ciri kemiskinan digital ini, di dapati para pendidik tidak tergolong dalam mana-mana kategori yang telah dinyatakan di dalam jadual 1. Ini kerana para pendidik tiada masalah dari sudut pendapatan dan ekonomi tetapi hanya mempunyai halangan dari segi akses teknologi iaitu fasiliti dalam menjayakan pembelajaran secara dalam talian.

Seterusnya, pada bahagian tema 2 ini akan membincangkan hasil analisis untuk mengenal pasti faktor-faktor yang menjadi penghalang kepada para pendidik sekolah luar bandar dalam menyertai pembelajaran atas talian di kawasan Sik, Kedah.

### ***Tema 2: faktor yang menghalang pendidik sekolah luar bandar untuk menyertai pembelajaran secara dalam talian***

Faktor kepuasan mengajar dibangkitkan oleh R1 dan R3 dalam mengendalikan kelas secara dalam talian. Menurut mereka, hampir mengalami tekanan emosi ekoran dari pengendalian kelas dalam talian. Perasaan ini timbul ekoran dari perasaan risau, kurang yakin serta bimbang untuk mengendalikan pengajaran secara dalam talian, seperti yang telah di bincangkan oleh Nur A'fini et al., 2021 dalam kajian mereka yang menyatakan para pendidik masih kurang yakin untuk mengajar secara dalam talian. Ini kerana seorang pendidik bukan sahaja perlu menyampaikan isi kandungan pengajaran semata-mata tetapi perlu memastikan komunikasi dua hala berlaku dan tidak terganggu (Königet al., 2020).

*“Tak okay. Saya kalau ada macam tu, saya antara orang yang tak menyokong la pembelajaran secara online ni sebab tak puas untuk mengajar. Mungkin ada perspektif yang kata, seronok la cikgu mengajar pakai teknologi dirumah kan tetapi sebenarnya stress, tension. Saya suka datang sekolah la mengajar lagi senang sebab nak mengajar pun berpuas hati”*

R1

*“Bila bersemuka ni kita boleh guna pancaindera kita kan seperti mata, dengar dan bercakap direct dengan mereka. Bila saya guna video call, duduk tengok saja budak tu bertasmik, kerusi duduk ngok ngok ngok, saya tidak boleh kata apa kan takut mak depa marah pulak kita tegur anak mereka. Kita kene control marah je bila online, kalau dekat sekolah ni memang kene dah budak ni”*

R3

Manakala R2 berpendapat mengajar secara dalam talian bukan satu perubahan yang positif, kerana cikgu tidak dapat melihat “impak” atau “hasil” yang benar-benar di depan mata. Beliau berpendapat, penggunaan teknologi dalam P&P sedikit meragukan apabila ditinjau dari aspek kualiti murid. Pendapat R2 ini disokong oleh kajian sebelum ini oleh Nguyen et al., (2021). Kajian tersebut

mengupas mengenai isu disiplin pelajar sewaktu pembelajaran dalam talian. Ini kerana sewaktu pembelajaran secara dalam talian berlangsung, murid-murid tidak fokus sehingga boleh mengganggu tumpuan mereka sewaktu pembelajaran berlaku menyebabkan pelajar tidak tahu untuk menyiapkan latihan atau kerja rumah.

*“kita tak nampak hasil tu. Kita tak tahu sama ada budak tu yang buat ke kerja sekolah atau orang lain ke yang buatkan!”*

R2

Dari sudut positifnya, tidak dapat disangkal bahawa banyak faedah yang diperolehi oleh para cikgu sepanjang pembelajaran secara dalam talian. Namun, keterbatasan akses kepada internet menjadi penghalang kepada mereka dan juga murid-murid (Liong & Nurfaradilla, 2022; Thannimalai & Baloh, 2021).

*“Satu sebab faktor line, masalah waktu tu. Kalau ikutkan suggestion daripada pihak sekolah memang macam-macam la kan. Tetapi, kawasan ni yang paling sesuai sekali Whatsap la”*

R1

*“Ya dari fasiliti kita dengan keupayaan student. Peranti terhad la apa semua. Kalau ikutkan daripada JPN dan PPD punya suggestion tu memang macam-macam la, suruh guna Google Meet apa semua, tetapi susah la....”*

R1

*“Line tu ada cuma kadang-kadang tak kuat sangat”*

R2

*“Kalau Google Meet mungkin la sebab boleh tengok. Tetapi tak dapat sambutan banyak sangat, sebab parents ramai yang kerja kan, budak pun guna telefon parents. Ada juga tak join sebab line internet tak berapa sangat”*

R2

*“Cuma masalah line sahaja la. Waktu dengar murid tu mengaji, tiba-tiba line mereka tiada, terpaksa tunggu esok la pula sambung...”*

R3

*“Dari segi gangguan line pun, bila kita hantar video mereka tidak boleh nak download tengok. Sebab benda-benda tu la. Jadi nak capai sepenuhnya tidak la, tidak seperti kita mengajar dalam kelas bersemuka”*

R3

Hasil analisis temubual ketiga-tiga informan, terdapat tiga faktor utama yang menghalang para pendidik sekolah luar bandar dalam mengendalikan pengajaran secara dalam talian iaitu; faktor ketidakelesaan atau kepuasan mengajar, faktor kualiti murid serta faktor akses kepada teknologi Internet/fasiliti. Berdasarkan kepada pemerhatian penyelidik, jelas menggambarkan isu kemiskinan digital sememangnya wujud dan dihadapi oleh para pendidik, terutamanya yang bertugas di kawasan luar bandar (Liong & Nurfaradilla, 2022).

## KESIMPULAN

Kemiskinan digital dalam kalangan para pendidik boleh menjadi penghalang dalam meningkatkan kualiti pendidikan dan menyediakan peluang pembelajaran yang sama untuk semua pelajar. Usaha perlu dilakukan untuk mengatasi halangan capaian, meningkatkan kemahiran dan kefahaman guru berkaitan ICT (Nuraimi & Fariza, 2017), serta memahami serta mengatasi sebarang rintangan yang mungkin wujud.

Adalah penting bagi institusi pendidikan di Malaysia untuk mengenali dan menangani faktor-faktor ini dengan menyediakan sumber teknologi yang mencukupi, latihan yang sesuai, sokongan teknikal yang kukuh dan strategi yang menggalakkan penglibatan pelajar dalam pembelajaran dalam talian. Menangani kemiskinan digital adalah penting untuk memastikan daya tahan pendidikan, keterangkuman dan kesan jangka panjang yang positif. Beberapa cadangan penyelesaian yang berpotensi termasuk:

Pertama, pembangunan infrastruktur: Kerajaan dan institusi pendidikan harus melabur dalam mengembangkan sambungan jalur lebar ke kawasan yang kurang mendapat perkhidmatan dan menyediakan akses internet yang boleh dipercayai di sekolah dan komuniti. Ini membantu merapatkan jurang digital dan membolehkan akses yang sama kepada sumber digital. Kedua, peruntukan peranti: Inisiatif untuk menyediakan pelajar daripada keluarga berpendapatan rendah peranti digital seperti komputer riba atau tablet boleh membantu memastikan mereka mempunyai alatan yang diperlukan untuk melibatkan diri dalam pembelajaran dalam talian. Kerjasama dengan organisasi sektor swasta atau entiti bukan untung boleh memudahkan program penyediaan peranti sedemikian. Ketiga, Latihan kemahiran digital: Di samping akses, menyediakan program latihan kepada cikgu, pelajar, dan ibu bapa tentang kemahiran literasi digital boleh memperkasakan mereka untuk menggunakan alatan dan teknologi digital dengan berkesan (Mahalingam & Khairul Azhar, 2021). Ini boleh meningkatkan keupayaan mereka untuk melibatkan diri dalam pembelajaran dalam talian. Akhir sekali, perkongsian dan kerjasama semua pihak (kerajaan, institusi pendidikan, organisasi sektor swasta dan entiti bukan untung) boleh membantu mengumpulkan sumber dan kepakaran untuk menangani kemiskinan digital secara menyeluruh. Perkongsian sedemikian boleh membolehkan pembangunan penyelesaian yang mampan dan memastikan sistem pendidikan yang lebih saksama dan inklusif.

Dengan menangani kemiskinan digital, sistem pendidikan boleh menyediakan pelajar dengan lebih baik untuk era digital, memupuk keterangkuman dan meningkatkan daya tahan keseluruhan mereka dalam menghadapi cabaran masa depan selaras dengan Anjakan ke 7- dalam Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025, iaitu memanfaatkan ICT bagi meningkatkan pembelajaran berkualiti di Malaysia.

## PENGHARGAAN

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## **LEARNING THROUGH PLAY: LEARNERS' USABILITY AND ENGAGEMENT IN BOARD GAME WITH THE MEEGA+ ASSESSMENT MODEL**

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### **ABSTRACT**

*Traditional teaching methods are limited in their ability to promote effective learning outcomes due to their lack of engagement, flexibility, and effective assessment. Consequently, these methods fail to engage students, meet their needs, and evaluate their mastery of skills and talent. To address these challenges, board games provide an interactive and engaging learning experience while also offering social interactions opportunities for effective outcomes. This study aims to investigate the impact of usability on learners' engagement, and a mediating role of social interactions in this relationship when students playing board games using the MEEGA+. This study focuses on the Personal Financial Planning course offered by the Faculty of Business and Management, UiTM Cawangan Melaka, Kampus Bandaraya Melaka. This study uses the non-probability of the purposive sampling technique to select participants from bachelor's degree students enrolled in the course. A quantitative study was conducted using a self-administered questionnaire distributed, and the proposed model and the hypothesized relationships were assessed using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The study's findings reported that usability components (aesthetics, learnability and operability) had significantly influenced student engagement when playing educational games. Meanwhile, these variables indirectly affected student engagement, with social interactions playing a mediating role in this relationship. It demonstrates that board games can be an effective tool for learning through play and highlight the importance of considering usability, social interactions, and engagement when designing educational games. The MEEGA+ offers a useful framework for evaluating game-based learning and can be applied to other types of educational games. The implications for educational technology include the potential for board games to enhance learning outcomes and the need for further research into game-based learning. Moreover, the study suggests that the MEEGA+ could be useful for designers and educators looking to create effective game-based learning experiences.*

**Keywords:** *usability; social interaction; student engagement; MEEGA+; board game*

## ABSTRAK

*Kaedah pengajaran tradisional terhad dalam keupayaan mereka untuk menggalakkan hasil pembelajaran yang berkesan kerana kekurangan penglibatan, fleksibiliti, dan penilaian yang berkesan. Akibatnya, kaedah ini gagal menarik minat pelajar, memenuhi keperluan mereka, dan menilai penguasaan kemahiran dan bakat mereka. Untuk menangani cabaran ini, permainan papan menyediakan pengalaman pembelajaran yang interaktif dan menarik sambil turut menawarkan peluang interaksi sosial untuk hasil yang berkesan. Kajian ini bertujuan untuk menyiasat kesan kebolehgunaan terhadap penglibatan pelajar, dan peranan pengantara interaksi sosial dalam hubungan ini apabila pelajar bermain permainan papan menggunakan MEEGA+. Kajian ini memfokuskan kepada kursus Perancangan Kewangan Peribadi yang ditawarkan oleh Fakulti Perniagaan dan Pengurusan, UiTM Cawangan Melaka, Kampus Bandaraya Melaka. Kajian ini menggunakan bukan kebarangkalian teknik persampelan bertujuan untuk memilih peserta daripada pelajar ijazah sarjana muda yang mendaftar dalam kursus tersebut. Satu kajian kuantitatif telah dijalankan menggunakan soal selidik yang ditadbir sendiri yang diedarkan, dan model yang dicadangkan dan hubungan hipotesis dinilai menggunakan Pemodelan Persamaan Struktur Separa Kuasa Dua Terkecil Separa (PLS-SEM). Dapatan kajian melaporkan bahawa komponen kebolehgunaan (estetik, kebolehbelaian dan kebolehkendalialian) telah mempengaruhi penglibatan pelajar dengan ketara semasa bermain permainan pendidikan. Sementara itu, pembolehubah ini secara tidak langsung mempengaruhi penglibatan pelajar, dengan interaksi sosial memainkan peranan pengantara dalam hubungan ini. Ia menunjukkan bahawa permainan papan boleh menjadi alat yang berkesan untuk belajar melalui bermain dan menyerlahkan kepentingan mempertimbangkan kebolehgunaan, interaksi sosial dan penglibatan semasa mereka bentuk permainan pendidikan. MEEGA+ menawarkan rangka kerja yang berguna untuk menilai pembelajaran berasaskan permainan dan boleh digunakan pada jenis permainan pendidikan yang lain. Implikasi untuk teknologi pendidikan termasuk potensi permainan papan untuk meningkatkan hasil pembelajaran dan keperluan untuk penyelidikan lanjut ke dalam pembelajaran berasaskan permainan. Selain itu, kajian itu mencadangkan bahawa MEEGA+ boleh berguna untuk pereka bentuk dan pendidik yang ingin mencipta pengalaman pembelajaran berasaskan permainan yang berkesan.*

*Kata Kunci: kebolehgunaan; interaksi sosial; penglibatan pelajar; MEEGA+; papan permainan*

## INTRODUCTION

Traditional teaching methods, which were prevalent in many educational institutions, relied heavily on lecture and rote memorization as the primary mode of instruction (Onofrei & Ferry, 2020; Wong, 2018; Qiao, Yeung, Zainuddin, Ng, & Chu, 2023). This has been the case since traditional teaching methods have been seen as the most effective way of imparting knowledge. However, in spite of the widespread usage of these approaches, they have been subjected to severe criticism owing to the fact that they are unable to successfully nurture good learning outcomes (Jian, 2019; Winstead & Huang, 2019). The decreasing level of student engagement is one of the primary issues that arises in connection with the use of conventional teaching techniques (Tadayon & Pottie, 2020). The majority of the time spent in a lecture is spent passively listening, which might result in decreased motivation and engagement, a lack of interest, and poor academic achievement as well as limited gains in knowledge (Martin & Martinez, 2016; Sabat, Abdel-Massih, Kanaan, Salloum, Serhan, Fares, Haddad, & Melki, 2022; Tortorella & Cauchick-Miguel, 2018). While it's possible that some students may thrive in a setting dominated by lectures, others could find it difficult to fully connect with the subject in the absence of more interactive and personalized instruction (Byusa, Kampire, and Mwesigye, 2022; Platz, 2022).

Conventional methods of instructing students have the additional drawbacks of not allowing for personalised attention to be given to each individual student (Qureshi, Khaskheli, Qureshi, Raza, & Yousufi, 2021). In large classroom environments, it may be challenging for teachers to provide individualised instruction and help to each individual student (Begy, 2017; Ghazal, Al-Samarraie, & Wright, 2020). This limited attention might lead to inadequate learning outcomes, which in turn could

lead to a decline in student enjoyment and engagement with the educational experience. In addition, traditional modes of education often put a higher focus on memorization by rote and the repetition of previously taught content than they do on the development of analytical and problem-solving skills in their students (Tortorella & Cauchick-Miguel, 2018). According to Qiao et al. (2023); and Wong (2018), this approach inhibits students' abilities to think creatively and independently, as well as their capability to apply what they have learned in the classroom to situations that occur in the real world. It does not create the essential talents that are needed for success in a world that is continuously changing.

In response to these limitations, educators and researchers have sought several alternative instructional approaches that promote active engagement, personalized learning, and critical thinking (Gilliam, Hill Jaworski, Sparrow, Jones & Jagoda, 2019). Because of this need, new forms of education including active learning, flipped classrooms, project-based learning, and game-based education have developed (Hendrix, Hojnoski, & Missall, 2020; Onofrei & Ferry, 2020; Wong, 2018; Qiao et al., 2023; Vlachopoulos, Jan, & Buckton, 2020). In this context, board games have lately attracted interest as an educational tool that offers substantial promise in addressing the limits of conventional teaching techniques (Barbara, 2019; Fjaellingsdal, & Klockner, 2020; Mercer, Kythreotis, Robinson, Stolte, George, & Haywood, 2017; Tsai, Liu, Chang, & Chen, 2021). The use of educational games, which are intended expressly to increase students' academic performance and overall learning experiences, has recently gained popularity and been shown to be a successful teaching method (Gilliam et al., 2019; Hsu & Chen, 2022; Yu et al., 2021). The benefits of playing instructional board games are not limited to a particular discipline or topic. Board games have been adopted as a technique of influencing players' learning activities in a variety of disciplines, including environmental science, accounting, history, parenting, cultural studies, and libraries (Barbara, 2019; Begy, 2017; Fjaellingsdal & Klockner, 2020; Tadayon & Pottie, 2020).

According to the findings of previous research (Barbara, 2019; Chin & Zakaria, 2015; Gkogkidis & Dacre, 2020; Martin & Martinez, 2016; Wong, 2018), board games have been widely recognised for their ability to foster engagement, interaction, and enjoyment among students, ultimately leading to increased motivation and improved learning outcomes. When it comes to the world of board games, the design and the mechanics play a significant part in deciding how playable the game will be (Anastasiadis, Lampropoulos, & Siakas, 2018; Murray et al., 2022; Vargianniti & Karpouzis, 2020). Aesthetics, learnability, and operability are all significant usability components that play a critical part in defining the overall usefulness of the players. If the flow of the game is well-structured, and if the challenges are well-balanced, then students will have an easier time grasping the concepts that are being taught, and they will sustain their attention throughout the whole of the gaming experience (Tsai et al., 2021). Students are better able to understand challenging concepts and put those concepts into practise thanks to the board games, which also increase engagement, interaction, and enjoyment (Barbara, 2019; Heron, Belford, Reid, & Crabb, 2018; Hsu & Chen, 2022; Ke, Xie, Xie, 2015; Martin & Martinez, 2016; Tadayon & Pottie, 2020; Wong, 2018). An evaluation of the use of board games, therefore, it is a necessary to analyse students' different learning environments, usability, and learning experiences through educational board games (Gibson & Douglas, 2013; Wong, 2018).

An analysis of how well board games support students' different learning environments, usability, and engagement is something that really has to be done (Gibson & Douglas, 2013; Gkogkidis & Dacre, 2020; Wong, 2018; Yu, Gao, & Wang, 2021). To date, however, much of the existing research on board games and engagement has focused on specific populations, such as elementary school students or those in specific subject areas (Barbara, 2019; Martin & Martinez, 2016; Wong, 2018). According to Fjaellingsdal and Klockner (2020), there is a need for more research that investigates the impact of usability of board games on student engagement across a wider range of populations and subject areas. In fact, the relevance of board games resides in its capacity to include social interactions (Fjaellingsdal & Klockner, 2020; Hoy, 2018). These interactions make it possible for players to offer quick feedback to one another, which in turn enhances the learning process and players' engagement. Although extensive research has been carried out on social interactions, there has been very little research done on the effect of a mediator in the relationship between usability and student engagement when playing board games. Therefore, it is essential for educators to improve the learning experience to understand the effect that social interactions has on the level of student engagement (Hsiao, Chang, Lin, & Hu, 2014).

As a consequence of this, the two main objectives of the current research are developed: 1) to



investigate the relationship between usability (aesthetics, learnability, and operability), and student engagement when playing board game; and 2) to analyse the mediating role of social interactions in the relationship between usability (aesthetics, learnability, and operability), and student engagement when playing board game. The purpose of the current study is to contribute to the empirical knowledge regarding the usability and social interactions of the board game and its subsequent effect on student involvement utilising the MEEGA+. The results contribute to the existing body of information on the design of educational games and offer insights into how board games may be successfully incorporated into the educational process. The findings also provide an addition to the current body of knowledge on the design of educational games. In the end, the aim of the study is to provide teachers and instructional designers with important information that they can use to better the use of board games as a pedagogical tool in personal financial planning courses. This information may be used to improve the effectiveness of using board games in these types of classes. As a direct result of this, it is reasonable to anticipate that the pupils will have improved educational results and a more interesting educational experience as a consequence of this.

## LITERATURE REVIEW

Traditional teaching and learning may be traced back to ancient civilizations, when information was predominantly passed down via oral traditions and apprenticeships (Jian, 2019; Winstead & Huang, 2019; Qiao et al., 2023). These early educational practises lay the groundwork for the formation of more formalised educational systems, such as those that are in use today. The construction of schools, colleges, and other educational institutions became vital in providing organised learning settings as societies evolved (Onofrei, & Ferry, 2020; Qureshi et al., 2021; Wong, 2018). Traditional pedagogical practises have consistently been an important part of the educational environment throughout the course of human history. It is common practise in schools all over the globe to teach students using techniques such as rote memorization and lecturing (Fjaellingsdal & Klockner, 2020; Hoy, 2018). In lecturing, educators convey knowledge to students via oral presentations. In rote memorization, students memorise facts or formulae by repeating them in their heads. These strategies have been selected because of their ease of implementation and capacity to effectively disseminate information to a significant number of students. Traditional teaching techniques, on the other hand, have been subjected to severe criticism for their inadequacies in terms of fostering good learning outcomes, despite the fact that they are widely used.

According to the findings of several studies, for example, Byusa, Kampire, and Mwesigye (2022); and Platz (2022), these teaching strategies may reduce the amount of active participation on the part of the students, which may have a negative impact on the overall quality of the educational opportunities available to the students. Students' active participation in the learning process is often restricted when they are required to memorise facts by heart or listen to lectures during which they are just passively acquiring knowledge (Ben Itzhak et al., 2023; Byusa et al., 2022; York, 2020; You, Sophia, Shih, Kai, Chien, & Yeu, 2022). As a consequence of this, students may have difficulty developing skills related to critical thinking and problem solving, as well as developing a profound grasp of the material being studied (Begy, 2017; Byusa et al., 2022). In addition, studies have shown that a lack of interest in traditional ways of education may lead to limited learning gains as well as poor academic accomplishment. Students may have trouble recalling information when it is presented to them in a fashion that is considered to be passive, and they may also find it more difficult to apply the ideas they have learned in academic settings to situations that are seen in the real world. According to Fjaellingsdal and Klockner (2020); and Onofrei and Ferry (2020), a disconnected between what is taught in the classroom and how it pertains to real-world circumstances may be the cause of a lack of motivation, engagement and apathy in the learning process.

Traditional teaching approaches are becoming less successful in fostering optimum learning outcomes due to this rigidity, especially as educational contexts grow more varied and constantly changing (Qureshi et al., 2021). The skills of critical thinking, creativity, and teamwork may be developed via the combination of project-based learning and problem-solving activities with more conventional teaching strategies (Hendrix et al., 2020). These methods push students to use what they've learned in practical situations, which has shown to improve both comprehension and retention.

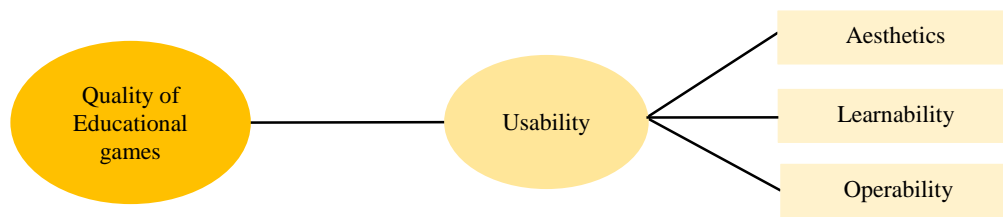
Educators and academics are increasingly interested in investigating non-traditional ways of instruction that better meet the demands of today's students (Wong, 2018; Qiao et al., 2023; Vlachopoulos, Jan, & Buckton, 2020). In response to this transition, a number of promising approaches have emerged, including educational board games to improve students' levels of interest, motivation, engagement, social interaction, and learning results as a whole (Yu et al., 2021). Board games, for instance, may be used to imitate real-world events and enable students to make educated decisions about the preservation of the environment and sustainable practises (Hsu & Chen, 2022; Mercer et al., 2017). Accounting-based board games for example, allow players to engage in interactive gaming and make financial decisions, which may help students get familiar with basic financial ideas and principles.

According to research published by Heron et al. (2018); and Lavendera, Omonib, Laisserc, McGowand, Wakasiakab, Maclean, and Angela Chimwazaf (2019), educational board games have recently emerged as a particularly promising technique within the field of creative teaching and learning. Educational board games provide a one-of-a-kind chance to increase student engagement, motivation, and successful learning outcomes because they combine aspects of play and learning (Byusa et al., 2022; Rajkovic, Ruzic, & Ljubic, 2019; Vargianniti & Karpouzis, 2020). Educational board games, in contrast to conventional methods of instruction, provide students a platform that is both physical and interactive, allowing them to investigate and put their acquired information to use (Anastasiadis et al., 2018; Ben Itzhak et al., 2023; Byusa et al., 2022; Hsiao et al., 2014; Gilliam et al., 2019; You et al., 2022). Students are given the opportunity to actively engage in the learning process by playing these games, which often offer them with real-life events, difficulties, and decision-making possibilities (Murray, Dunstan, Heron, Holland, Palmer, Price, & Basham, 2022; Wong & Yunus, 2021). This results in enhanced student motivation and deeper engagement with the subject matter (Gkogkidis & Dacre, 2020; Hsu & Chen, 2022; Qiao et al., 2023; Qureshi et al., 2021).

### **MEEGA+ Assessment Model and Educational Board Games**

Petri, Von Wangenheim, and Borgatto (2016); and Petri, Von Wangenheim, and Borgatto (2017) provide the MEEGA+, a pedagogical framework that highlights the incorporation of games, especially board games, as a potent instrument for teaching and learning. MEEGA+, a model of educational experiences based on games and analysis, which is an acronym for model of educational experiences based on games and analysis. This model recognises the potential of video games to give students with authentic learning experiences that foster collaboration, critical thinking, and problem-solving skills. The MEEGA+ for evaluating games goes beyond the simplistic view of games as only entertainment. Instead, it acknowledges games' inherent qualities and seeks to use those qualities to provide impactful learning opportunities for students. The strategy highlights the possibility that learning via gaming is a paradigm shift that facilitates in-depth understanding and long-term retention of concepts. By incorporating game-based learning activities into the curriculum, teachers may capitalise on the attention-grabbing and inspiring nature of games. By providing students with opportunities to participate actively in the learning process, games make school more interesting and enjoyable for the youngsters. In the setting of the game, students may explore scenarios that may arise in the real world, solve challenging problems, and make decisions that may have consequences.

The MEEGA+ provides a framework for evaluating and assessing student progress within the context of game-based learning. Understanding and evaluating the usability and player experience of games is crucial for creating effective and engaging learning experiences (Petri et al., 2016; Petri et al., 2017). According to the MEEGA+, considering motivation, user experience, usability, and engagement, enjoyment, and educators can ensure that the games they incorporate into their teaching are not only educational but also captivating and enjoyable for students. By evaluating the usability of educational board games, educators can refine and optimize their design and implementation. This assessment process helps identify areas where improvements can be made to align the games more effectively with the desired learning goals. Moreover, considering usability enables educators to address potential barriers or challenges that students may encounter while interacting with the game. It allows for the identification of accessibility issues or design elements that might hinder learning or create frustration. By adjusting based on this feedback, educators can ensure that the games are inclusive and accessible to all students, regardless of their background or abilities. Figure 1 illustrates the quality of educational games based on MEEGA+.



**FIGURE 1.** MEEGA+ to Evaluate Educational Games

### **Usability, Social Interactions, and Student Engagement in Board Games**

Usability is an extremely important factor to consider when developing instructional board games since it directly affects how engaged students are and how much they learn. The MEEGA+ offers a helpful framework that places an emphasis on the usability of the software by the end user. This helps to ensure that the design of game-based learning experiences successfully satisfies the requirements of students. Aesthetics, learnability, operability, and accessibility are some of the important characteristics that are taken into consideration within this model in order to maximise user usage (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). The user usability of instructional board games is significantly impacted by the board games' aesthetics. Students' motivation, immersion, and understanding of the game material are all significantly impacted by the game's visual design, visuals, and general presentation, which are all critical parts of the experience. The user experience may be improved overall by paying careful attention to the aesthetics of the game, which will result in the game being more aesthetically pleasing and interactive. Students' attention may be captured, their interest can be sparked, and a positive emotional connection can be made to the game via the use of high-quality artwork, visually appealing components, and thematic consistency.

The MEEGA+ also takes learnability into serious consideration as an important aspect. It relates to the ease with which pupils can comprehend the game's rules and instructions, as well as traverse the game's mechanics (Petri et al., 2016; Petri et al., 2017). The learnability of educational board games may be improved by designing them with rules that are easy to understand and remember, gaming dynamics that are intuitive, and learning goals that are organised in a logical fashion. When students are able to rapidly understand the game's rules and mechanics, they are able to concentrate more on the educational material and participate in activities inside the game that are relevant to them. The term operability relates to how user-friendly and functional the various components and interfaces of the game are. Students should be able to easily and effectively engage with games; thus game designers should make that a priority while developing new titles. The playability of the game is improved by having controls that are easy to understand, feedback methods that are unambiguous, and user interfaces that are straightforward. The students' overall user experience and engagement is improved when they can move around the game quickly, acquire essential information, and interact with game features without experiencing frustration.

The intuitiveness and responsiveness of the game controls and navigation are the emphasis of operability. To give students with a seamless and pleasurable experience, a user-friendly interface and smooth gaming mechanics are required. Because they are typically intended to be interactive, demanding, and engaging, board games have the potential to increase student involvement in learning activities (Barbara, 2019; Begy, 2017; Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). Many board games' competitive and cooperative natures may also encourage student cooperation, social engagement, and communication skills. According to research, students who participate in learning activities such as board games are more likely to have greater learning results. They are more likely to be motivated to study, retain knowledge more effectively, and apply what they have learned in new situations. Students who are engaged are more likely to acquire crucial abilities such as critical thinking, problem solving, and communication.

It recognises that games have the ability to promote and improve social interactions among students by encouraging cooperation, communication, and teamwork (Hsiao, Chang, Lin, & Hu, 2014). Whether via cooperative gameplay, team-based tasks, or competitive encounters, games often demand players to collaborate. Educators may create an atmosphere where students learn from and alongside

their classmates by introducing game-based learning activities that stimulate social engagement. Students may build and refine their communication and interpersonal skills via collaborative games. They learn how to successfully express themselves, listen to others, negotiate, and collaborate in order to attain shared objectives. These social interactions instil a feeling of shared responsibility in children and encourage them to examine diverse viewpoints and answers. Furthermore, games offer an environment for students to participate in social interactions that may vary from those seen in typical classroom settings. Students may connect with their classmates in a more relaxed and casual setting, which often results in improved involvement and engagement. The excitement and intrinsic motivation provided by games may foster a pleasant social environment and foster connections among students.

### **Hypotheses Development and Proposed Research Framework**

MEEGA+ outlines several key factors that contribute to usability and player experience, such as aesthetics, learnability, and operability (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). Player usability has a significant impact on students' engagement when participating in board games for learning activities (Barbara, 2019; Begy, 2017; Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). A game's usability relates to how quickly students can traverse the game and interact with its components. When a game has strong player usability, it provides students with a seamless and intuitive experience, thereby increasing their engagement and drive to study. If, on the other hand, a game is difficult to use or comprehend, students may grow irritated and lose interest, resulting in a reduction in their learning results. Aesthetics, as one of the primary variables impacting player usability, is important in determining a game's overall appeal (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). Visually attractive visuals, artwork, and design components of a game may elicit good feelings in students. A game with bad aesthetics, such as confused images or an unappealing presentation, on the other hand, might create visual discomfort or bewilderment, which can reduce engagement.

Another essential feature of player usefulness is learnability (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). Students are more likely to comprehend the game mechanics, rules, and goals if the game is simple to play and understand. Students are more likely to feel competent and inspired to continue playing if they can readily learn and navigate the game's structure. A game that is extremely complicated or difficult to understand, on the other hand, may deter pupils from fully participating with it, thus resulting in worse learning results. Another element impacting player usefulness is operability, which refers to how simple it is for students to control the game. Students may easily connect with a game that has easy controls, clear directions, and simple navigation. Intuitive operability improves the whole game experience, which leads to more engagement. A game with complex or complicated controls and navigation, on the other hand, might cause irritation and impede students' ability to completely immerse themselves in the learning experience, resulting in diminished engagement.

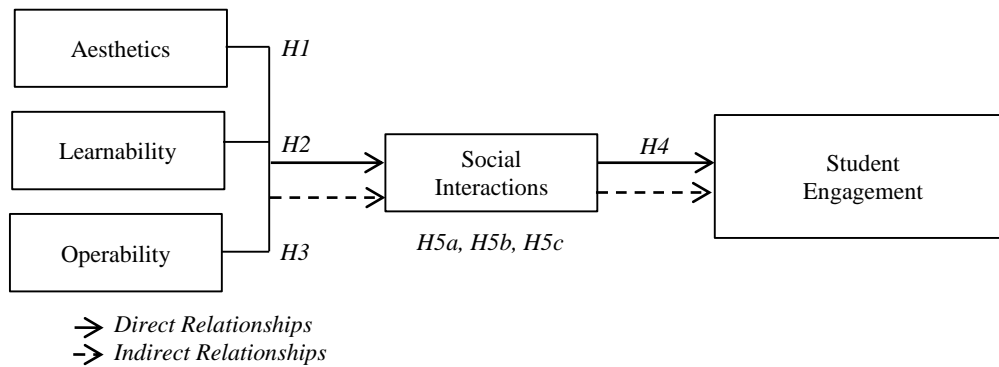
Board games provide entertainment and social interactions, but educators also see them as effective educational tools (Fjaellingsdal & Klockner, 2020; Hoy, 2018; Lee, Jeong, Park, & Ryu, 2011; Rajkovic et al., 2019). These games offer immersive learning experiences beyond passive memorization, engaging students in decision-making, problem-solving, and critical thinking (Barbara, 2019; Begy, 2017; Fjaellingsdal & Klockner, 2020). The meaningful of board games incorporates social interactions and allow players providing instant feedback until they achieved the success in the learning process (Fjaellingsdal & Klockner, 2020). The lack of social interactions in board game sessions hinders student engagement and enjoyment, necessitating effective strategies for educators. Aesthetics, learnability, and operability in board games have a significant impact on social interactions during gameplay. The visual design, theme, and overall presentation of a board game, collectively known as aesthetics, can greatly influence the social dynamics among players. When a game is visually appealing, it creates a positive and engaging atmosphere that enhances the overall experience for players. Aesthetically pleasing games spark interest, generate excitement, and contribute to a sense of enjoyment among the players. This positive ambiance can facilitate stronger social interactions, as players are more likely to be enthusiastic, open, and engaged in interactions with others (Lee et al., 2011).

The learnability of a board game refers to how easily players can understand and grasp the rules and mechanics of the game. When a game has clear and intuitive rules, it reduces barriers to entry and enables players to quickly get involved. This ease of learning fosters a sense of inclusivity and

encourages players to actively participate and interact with one another. Players can focus on socializing, strategizing, and collaborating rather than struggling with complex rules. As a result, learnable games promote smoother social interactions and facilitate the formation of social bonds among players. Operability, on the other hand, pertains to the ease with which players can interact with the game components and manipulate game elements. When a game has intuitive and user-friendly controls, it allows players to engage with the game mechanics effortlessly. Smooth operability eliminates frustration and distractions, enabling players to focus more on socializing and building relationships. Easy-to-use game components, such as cards, tokens, or game boards, promote efficient communication and collaboration among players. Operability enhances the flow of gameplay, creating a positive environment for social interactions.

In order to investigate the impact of usability and social interactions on student engagement, Figure 2 illustrates the proposed the research framework for this current study and the following hypotheses were developed to explain the direct and indirect relationships:

- H1. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between aesthetics and student engagement when playing board game*
- H2. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between learnability and student engagement when playing board game*
- H3. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between operability and student engagement when playing board game*
- H4. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between social interactions and student engagement when playing board game*
- H5a. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between aesthetics and student engagement mediated when social interactions in playing board game*
- H5b. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between learnability and student engagement mediated by social interactions when playing board game*
- H5c. There is a statistically significant relationship (at the level  $\alpha \leq 0.05$ ) between operability and student engagement mediated by social interactions when playing board game*



**FIGURE 2.** Proposed Research Framework

## METHODOLOGY OF STUDY

This study employed a quantitative approach to gather data using standardized measures such as surveys, experiments, or observational studies. This approach relies on precise, objective, and numerical data to test hypotheses and make predictions regarding a population, making it particularly valuable for establishing cause-and-effect relationships or making predictions (Brant, Haas-Haseman, Wei, Wickham & Ponto, 2015). This study involved the utilization of multiple-item questionnaires, which based on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). Data were gathered from bachelor’s degree students who were currently enrolled in the Personal Financial Planning course at the Faculty of Business and Management, Universiti Teknologi MARA (UiTM)

Cawangan Melaka, Kampus Bandaraya Melaka. To ensure an appropriate sample, a purposive sampling technique was employed. This non-probability sampling approach allows the researcher to deliberately select informants based on specific characteristics that have been identified in advance. It is worth noting that data were collected from a diverse range of programs, including Finance, Human Resource Management, International Business, Marketing, and Office Management.

The survey items used in this study were adapted from a previous study by Petri et al. (2016) to assess the quality of educational games in terms of usability and student engagement. These items were derived from the MEEGA+ (Model for the Evaluation of Educational Games), which was specifically designed to evaluate students' reactions following gameplay. The researchers utilized a total of ten items to measure player usability: aesthetics, learnability, operability, and social interaction. Within the aesthetics component, two survey items were included to assess the visual appeal and attractiveness of the game. The learnability component consisted of three items that focused on the game's ease of understanding, clarity of instructions, and how quickly students were able to grasp the gameplay mechanics and concepts. The operability component included two items that evaluated the functionality of the game, such as the responsiveness of controls and the ease of navigation within the game interface. Lastly, the social interactions component comprised three items that measured the extent to which the game facilitated meaningful interactions among players. In addition, this current study included ten items for student engagement, which were adapted from a study by Maroco, Maroco, Campos, and Fredricks (2016). These items were chosen to capture various aspects of student engagement, including their motivation, involvement, and interest in the game.

This current study employed the partial least square structural equation modelling (PLS-SEM) approach, utilizing SmartPLS 3.2.8 software, to test the hypotheses. PLS-SEM is a statistical technique widely used in social science research, specifically designed to predictively test theoretical frameworks. As a subset of structural equation modelling (SEM), PLS-SEM is particularly suitable for estimating and analysing causal relationships between observed and unobserved variables. It is popular due to its ability to handle complex models with numerous variables and relationships, to accommodate non-normal data and small sample sizes (Hair, Hult, Ringle, & Sarstedt, 2017). Latent variables were represented by composites of observed variables, which are weighted averages of the observed variables. A two-step PLS-SEM approach was utilized to validate both the outer (measurement) and inner (structural) models on a sample of respondents. This validation process ensures the quality of the empirical work by examining both the measurement and structural models (Urbach & Ahlemann, 2010). To validate the measurement model, the study assessed internal consistency, indicator reliability, convergent validity, discriminant validity, and multicollinearity. The PLS-SEM structural model's explanatory and predictive power were assessed using the coefficient of determination, effect magnitude, path coefficients, predictive relevance, and relative impact.

## RESULTS AND DISCUSSION

In this study, IBM SPSS Version 29 was used as the first stage in the data analysis process, and then Smart-PLS software was used as the second step. It was discovered that there were no missing values in the data, which explains that the respondents answered all of the questions. A total of 200 questionnaires were received, and it was determined that there were no missing values in the data. The majority of participants in the study were females, making up 69.0 percent of the total, while males made up 31.0 percent. Everyone who participated was of Malay respondents. As can be seen in Table 1, 60.0 percent of the applicants came from the field of finance, 18.5 percent came from the field of marketing, 17.5 percent came from the field of human resource management, and 2.0 percent came from the field of international business and office management.

**TABLE 1.** Demographic Data ( $n=200$ )

Items	Frequency	Percent
<i>Gender</i>		
Male	62	31.0

Female	138	69.0
<i>Ethnicity</i>		
Malay	100	100
Bumiputera Sabah	-	-
Bumiputera Sarawak	-	-
<i>Program</i>		
Finance	120	60.0
Human Resource Management	35	17.5
International Business	4	2.0
Marketing	37	18.5
Office Management	4	2.0

To evaluate the effectiveness of the confirmatory factor analysis (CFA), this study assessed the reliability, convergent validity, and discriminant validity of the items. To determine convergent validity, Hair et al. (2010) suggested examining the loadings, composite reliability (CR), and average variance extracted (AVE). As presented in Table 2.0, the loadings of all items were higher than the recommended threshold of 0.5. The CRs of all constructs ranged from 0.640 to 0.939, exceeding the established cut-off of 0.70 (Nunnally, 1978; Gefen, Straub & Boudreau, 2000). Additionally, the AVE values were greater than or equal to 0.5, in line with Bagozzi and Yi's (1988) recommended value of 0.5, indicating that over half of the variance in the observable measurement items was explained by the latent factors, on average (Fornell & Larcker, 1981).

**TABLE 2.** Convergent Validity of the Reflective Items in the Measurement Model

Constructs/Items	Loadings	CR <sup>a</sup>	AVE <sup>b</sup>
<i>Aesthetics (AES)</i>			
The game design is attractive (interface, graphics, cards, boards, etc.) (AES1)	0.932	0.920	0.852
The text font and colours are well blended and consistent (AES2)	0.914		
<i>Learnability (LEA)</i>			
I needed to learn a few things before I could play the game (LEA1)	0.640	0.860	0.677
Learning to play this game was easy for me (LEA2)	0.897		
I think that most people would learn to play this game very quickly (LEA3)	0.904		
<i>Operability (OPE)</i>			
I think that the game is easy to play (OPE1)	0.921	0.923	0.857
The game rules are clear and easy to understand (OPE2)	0.930		
<i>Social Interaction (SI)</i>			
I was able to interact with other players during the game (SI1)	0.697	0.867	0.687
The game promotes cooperation and/or competition among the players (SI2)	0.876		
I felt good interacting with other players during the game (SI3)	0.898		
<i>Student Engagement (ENG)</i>			
I feel motivated to participate in this game (ENG1)	0.890	0.974	0.786
I am interested in the topics we are learning about in game (ENG2)	0.908		
I feel challenged by the coursework in this game (ENG3)	0.906		
I feel like my contributions are valued by my teacher (ENG4)	0.849		
I feel like I am part of a community of learners in this game (ENG5)	0.886		
I feel supported by my teacher when I need help (ENG6)	0.888		
I feel like I have opportunities to learn from my mistakes in this game (ENG7)	0.913		

I feel like my teacher gives me feedback that helps me improve (ENG8)	0.867
I feel like I am making progress in my learning in this game (ENG9)	0.881
I feel like I have a sense of ownership over my learning in this game (ENG10)	0.878

In this study, the discriminant validity of the components was determined using the heterotrait-monotrait correlations (HTMT) criterion. Henseler, Ringle, and Sarstedt (2015) argued that the Fornell-Larcker criterion, which is commonly used, has low sensitivity and may not be able to detect discriminant validity issues as effectively as the HTMT criterion. Based on the HTMT results presented in Table 3.0, none of the inter-construct correlations exceeded 0.90, indicating that none of the correlations met the HTMT.90 requirement. Therefore, the HTMT results confirmed a lack of discriminant validity.

**TABLE 3.** Heterotrait-monotrait Correlations (HTMT) Criterion

Constructs	AES	LEA	OPE	SI	ENG
AES					
LEA	0.619				
OPE	0.549	0.888			
SI	0.502	0.747	0.708		
ENG	0.377	0.501	0.469	0.497	

Notes: AES-Aesthetics; LEA-Learnability; OPE-Operability; SI-Social Interactions; ENG-Engagement

This study utilized the SPSS software package (version 29) and the SmartPLS software (version 4.0) to perform Partial Least Square structural equation modelling (PLS-SEM), aiming to maximize the explained variance of the dependent latent variables (Hair, Black, Babin & Anderson, 2010). The measurement model was assessed and analysed, taking into consideration various criteria including internal consistency reliability, indicator reliability, convergent reliability, and discriminant validity. The hypotheses proposed in this study were evaluated using PLS-SEM in two stages: 1) assessment of the measurement model, and 2) evaluation of the structural model (Hair, Sarstedt & Ringle, 2012). To determine the statistical significance of path coefficients and other related results, a bootstrapping method was employed. This non-parametric procedure involved generating the results of each path relationship in the model through repeated random sampling, allowing for hypothesis testing and the identification of standard errors (Hair et al., 2010). In order to assess the inner validity and reliability of the conceptual framework in this study, the PLS algorithm was executed. The measurement model is depicted in Figure 2.0, providing an illustration of the framework's components.

## Hypotheses Testing

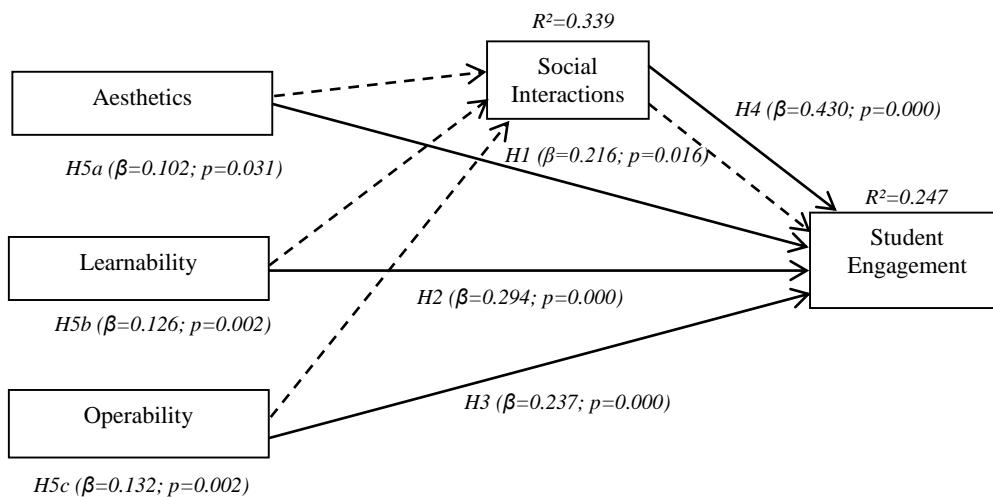
The structural model in Figure 3 shows the  $\beta$ -value in a path relationship that exhibits the strength of the relationship between exogenous and endogenous variables, and the  $R^2$  value indicates the overall predictive power of the structural model. It can be observed that there was a significant relationship between aesthetics and student engagement in playing board game ( $\beta=0.216$ ,  $t=2.154$ ,  $p\text{-value}=0.016$ ). Thus, the proposed  $H1$  was confirmed.  $H2$  proposed that there is a significant relationship between learnability and student engagement in playing board game ( $\beta=0.294$ ,  $t=3.533$ ,  $p\text{-value}=0.001$ ). Therefore,  $H2$  was statistically significant. Additionally, it is observed that hypothesis ( $H3$ ) had a significant relationship between operability and student engagement in playing board game ( $\beta=0.307$ ,  $t=1.84$ ,  $p\text{-value}=0.034$ ). Therefore,  $H3$  was statistically significant. Meanwhile, the findings also suggested that there is a significant relationship between social interaction and student engagement in playing board game ( $\beta=0.430$ ,  $t=7.279$ ,  $p\text{-value}=0.000$ ). Therefore,  $H4$  was statistically significant. Regarding the coefficient of determination, the structural model estimates that aesthetics, learnability, operability, social interactions and explained 24.7 percent ( $R^2$ ) of the variance in student engagement when playing board game.



Mediation analysis is a well-established approach used to explore the relationships between variables in a research study (Cohen, 1988; Hair et al., 2010). In this study, the mediation analysis was conducted using the bootstrapping method in Smart PLS 4.0 to test the mediation hypotheses. Following the approach outlined by Preacher and Hayes (2004), the indirect effects were assessed by bootstrapping. With 200 observations, 5,000 bootstraps were generated with a 95 percent bias corrected confidence interval and bootstrapped percentile for indirect effect. The results indicate that aesthetics → social interactions → student engagement ( $\beta=0.102, t=1.883; p=0.031$ ); learnability → social interactions → student engagement ( $\beta=0.126, t=3.068; p=0.002$ ); and operability → social interactions → student engagement ( $\beta=0.132, t=3.055; p=0.002$ ) had a significant mediation. Therefore, *H5a*, *H5b* and *H5c* were supported which explained 33.9 percent ( $R^2$ ) of the variance in social interactions in the relationships between aesthetics, learnability, operability, and student engagement when playing board game. Table 4 shows the path coefficient results and hypotheses testing, while Figure 2 illustrates the structural model with path coefficient.

**TABLE 4.** Path Coefficient and Hypotheses Testing

Hypotheses	Relationships	t-Value	p-Value	Decisions
H1	Aesthetics (AES) → Student Engagement (ENG)	2.154	0.016	Accepted
H2	Learnability (LEA) → Student Engagement (ENG)	3.533	0.000	Accepted
H3	Operability (OPE) → Student Engagement (ENG)	3.461	0.001	Accepted
H4	Social Interactions (SI) → Student Engagement (ENG)	7.279	0.000	Accepted
H5a	Aesthetics (AES) → Social Interactions (SI) → Student Engagement (ENG)	1.883	0.031	Accepted
H5b	Learnability (LEA) → Social Interactions (SI) → Student Engagement (ENG)	3.068	0.002	Accepted
H5c	Operability (OPE) → Social Interactions (SI) → Student Engagement (ENG)	3.055	0.002	Accepted



**FIGURE 3:** Structural Model with Path Coefficient

**CONCLUSION**

The findings of this study shed light on the link between usability and student engagement while playing a board game. The data show that aesthetics, learnability, operability, and social interactions all play important roles in boosting student engagement. This study confirms previous research showing that

aesthetics have a substantial effect on student engagement, for example in Ben Itzhak et al. (2023); Petri et al. (2016); and Petri et al. (2017). It would seem that in the context of board games for instructional purposes, aesthetics is not as significant as it is in other contexts. The importance of aesthetics in the field of instructional board games is sometimes overlooked because of the focus on user experience. Aesthetics have been shown to have a significant impact on students' engagement and learning experiences because of the pleasant emotional reaction they evoke. Students are more likely to be interested in and engaged by a game if it has aesthetically pleasing features like fascinating artwork, bright colours, and well-designed components. Aesthetics also help players feel like they're really there in the game. Students' emotional investment and connection to the learning experience increases when the game's design captures their attention aesthetically. Students are more likely to invest in the game's outcomes, characters, and stories if they have a better emotional connection to them.

Learnability, another key factor, determines how easily students can understand and grasp the rules and mechanics of the game participation (Barbara, 2019; Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). When a game has clear and intuitive rules, students are more likely to feel confident and empowered to actively participate and make informed decisions during gameplay. The ability to quickly grasp the game's concepts and mechanics not only reduces frustration but also fosters a sense of competence, motivation, and engagement among students. Operability, referring to the ease of interacting with the game components, also plays a vital role in student engagement. When a game is designed with user-friendly controls and intuitive mechanisms, students can navigate and manipulate the game elements smoothly (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). This seamless interaction allows students to focus their attention on the strategic aspects of the game and encourages active involvement and collaboration with fellow players. Easy-to-use game components promote a sense of agency and competence, contributing to heightened engagement.

Furthermore, social interactions have been highlighted as an important mediating role in student engagement when playing board games. Students that engage in meaningful social interactions develop a feeling of community, collaboration, and solidarity (Fjaellingsdal & Klockner, 2020; Hoy, 2018; Rajkovic et al., 2019). During games, collaborative problem-solving, bargaining, and communication with peers develop a feeling of belonging and encourage active involvement. Students learn from and with one another, exchanging ideas, discussing tactics, and offering feedback to improve their learning experiences and general engagement. These social interactions not only improve the learning experience, but they also create a supportive and inclusive atmosphere that promotes active involvement and participation (Lee et al., 2011). Students acquire critical thinking skills, improve their communication talents, and obtain a greater knowledge of the game's themes and goals through participating in conversations, negotiations, and partnerships. During board game play, social connection works as a moderator between aesthetics, learnability, operability, and student engagement. It increases the influence of these characteristics by encouraging student communication, cooperation, and shared experiences.

The present study's results help us comprehend aesthetics, learnability, operability, and social interactions in student engagement within the MEEGA+. As established, aesthetics have an important impact in attracting pupils' attention and eliciting favourable emotional reactions. This link may be investigated further using theoretical approaches such as the aesthetics and emotion framework. Learnability is also vital, as shown by the need for well-structured game flows and balanced challenges that match with learning theories and instructional design. Operability, with its emphasis on simple controls and user-friendly interfaces, is important for student engagement and participation, relying on usability and user experience design concepts. Finally, the results emphasise the mediating function of social interactions in student engagement, which is consistent with the MEEGA+. These theoretical frameworks may help us learn more about how social interactions improves student engagement and learning outcomes. Furthermore, the study's practical implications are beneficial to game designers, educators, and academics. Educators may increase learnability and critical thinking abilities by using well-structured game flows and balanced challenges.

There are various limitations to this research that should be noted when interpreting the results. To begin, the sample in this research was made up of bachelor's degree students enrolled in a certain course at a specific university. As a consequence, the results' generalizability to different student demographics or educational situations may be restricted. The results may not be relevant to students at various educational levels or from distinct student groups with variable traits and backgrounds. To

improve the external validity of the results, future study should involve a more varied sample. Second, the study's measuring tool relied on self-report measures. Despite attempts to assure the validity and reliability of the modified survey questions, self-report measures are susceptible to biases such as social desirability bias and memory recall bias. Participants may produce more positive evaluations or have trouble remembering their engagement experiences properly. Additional study approaches, such as observations or interviews, might give a more complete picture of student participation in instructional board games.

Third, the study's cross-sectional methodology makes it difficult to demonstrate causal correlations between usability components and student engagement. Data recorded at a single moment in time cannot accurately reflect the dynamic nature of involvement and the possible changes that may occur over time. Longitudinal studies that monitor engagement levels over time would offer a more complete picture of the link between usability components and student engagement. Furthermore, the study's primary emphasis was on usability criteria, notably aesthetics, learnability, and operability. While these elements were discovered to have substantial impacts on student engagement, it is crucial to note that other variables such as game content, instructional design, and individual learner characteristics may also play a role. Future research should consider a broader range of user experience namely confidence, challenges, satisfaction, fun, focused attention, relevance and perceived learning to determinant student engagement in educational board games. Finally, this study was carried out in a controlled environment, which may restrict the external validity of the results. When evaluating the data, it is critical to understand the practical limits and contextual elements that may impact student participation in real educational situations.

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## **IMPAK DOMAIN EMOSI, KESEDARAN KENDIRI, KESEJAHTERAAN EMOSI DAN PENGAWALSELIAAN EMOSI KE ATAS NORMA BEKERJA DARI RUMAH**

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### **ABSTRAK**

*Kajian ini mengkaji impak domain kecerdasan emosi ke atas norma bekerja dari rumah penjawat awam. Tujuan khusus kajian ini adalah untuk menguji pengaruh emosi melalui empat domain inventori kecerdasan emosi ke atas persepsi norma bekerja dari rumah dalam kalangan penjawat awam di sebuah badan berkanun di Malaysia. Responden yang terpilih dalam kajian ini adalah dari kategori perkhidmatan akademik dan bukan akademik. Instrumen pertama yang digunakan adalah soal selidik yang dibangunkan oleh penyelidik, dan telah melalui proses pengesahan instrumen, muka dan konstruk, iaitu Inventori Domain Kecerdasan Emosi (EIDInv; Siti Sarawati Johar, 2021). Manakala soal selidik untuk pemboleh ubah kedua adalah Instrumen Norma Bekerja dari Rumah, yang diadaptasi daripada Instrumen Bekerja Dari Rumah Cabaran COVID-19 (WFHI-CvdC; Siti Sarawati Johar, 2021). Dalam kajian ini, analisis regresi digunakan untuk menentukan kesan kecerdasan emosi melalui empat domain kecerdasan emosi ke atas persepsi norma bekerja dari rumah. Hasil dapatan kajian menunjukkan wujudnya impak yang signifikan dalam hubungan dan kesan semua pemboleh ubah yang dikaji. Sumbangan kajian ini adalah sebagai tambahan literatur dan rujukan untuk pengkaji lain dalam meneroka lebih luas berkaitan persoalan kesejahteraan emosi dan tingkah laku, melalui ilmu psikologi organisasi, mahupun perkaitannya dengan isu-isu kehidupan sosial dan ekonomi masyarakat.*

*Kata Kunci: Impak, Emosi, bekerja, rumah, penjawat awam*

### **ABSTRACT**

*This study examines the impact of the domain of emotional intelligence on the norm of working from home in civil servants. The specific purpose of this study is to test the influence of emotions through the four domains of the emotional intelligence inventory on the perception of working from home norms among civil servants in a statutory body in Malaysia. The respondents selected in this study are from academic and non-academic service categories. The first instrument used is a questionnaire developed by the researcher, and has gone through the instrument, face, and construct validation process, which is the Emotional Intelligence Domain Inventory (EIDInv; Siti Sarawati Johar, 2021). While the questionnaire for the second variable is the Work from Home Norm Instrument, which is adapted from the Work from Home Instrument COVID-19 Challenge (WFHI-CvdC; Siti Sarawati Johar, 2021). In*

*this study, regression analysis was used to determine the effect of emotional well-being through the four domains of emotional intelligence on the perception of work from home norm. The results of the study show that there is a significant impact in the relationships and effects of all the variables studied. The contribution of this study is as an addition to the literature and a reference for other researchers in exploring more broadly related to the issue of emotional and behavioral well-being, through the science of organizational psychology, as well as its connection with the issues of social and economic life of the community.*

*Keywords: Impact, emotions, work, home, civil servants*

## **PENGENALAN**

Warga pekerja adalah sumber tenaga manusia yang sangat signifikan dalam berfungsi sebagai modal insan sesebuah negara. Pekerja merupakan salah satu daripada entiti dalam jentera pentadbiran dan pengurusan, dalam mencorak serta menentukan arah kemajuan masyarakat dan negara merangkumi kepelbagaian aspek dalam mencapai keupayaan peningkatan kualiti hidup (Johar, 2019). Selaras dengan realistik sumber manusia sebagai modal insan dalam usaha negara menjana kelestarian transformasi, ia adalah jelas saling berkolaborasi antara visi dan misi operasi dalam organisasi bagi mencapai pengurusan yang selari dengan panduan yang dirangka dan disediakan oleh Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia (MAMPU, 2009).

Akan tetapi, penularan COVID-19 yang berlaku pada tahun 2020 sehingga mencetuskan fenomena pandemik sejagat telah mengubah senario dunia amnya dan negara khususnya ekoran memberikan kesan yang besar dan berat kepada semua ahli masyarakat merangkumi pelbagai aspek kehidupan iaitu sosial, ekonomi, fizikal, emosi dan mental. Sehubungan itu, tarikh 18 Mac 2020 adalah tempoh bermulanya Perintah Kawalan Pergerakan (PKP) untuk aktiviti melibatkan kedai, pejabat, universiti dan sekolah yang perlu ditutup sebagai antara usaha proaktif untuk menghentikan penularan virus COVID-19 di Malaysia (Syah Rul, 2020). PKP adalah terpakai untuk setiap penjawat awam kerana perlu bekerja dari rumah (BDR), walau bagaimanapun terdapat kelonggaran terhadap petugas barisan hadapan (Rusli, 2020). Bermula detik itu, rakyat di Malaysia yang merangkumi penjawat awam mahupun swasta perlu tinggal di rumah dan melakukan kerja seadanya dari rumah sepanjang tempoh PKP. Dengan itu, bermulalah detik norma bekerja dari rumah dan ia diiringi dengan sejarah pandemik yang tidak mungkin dilupakan oleh semua. Walaupun norma itu tidak lagi diaplikasikan pada masa ini setelah tiga tahun berlalu ekoran fasa kini adalah fasa peralihan endemik, namun pendedahan norma bekerja yang baharu kepada warga pekerja di negara ini telah membawa suatu transformasi dalam budaya bekerja yang tidak semestinya perlu bekerja di tempat kerja, sebaliknya sesiapa sahaja sama ada majikan mahupun pekerja perlu bersedia beradaptasi dengan apapun kemungkinan sekiranya norma bekerja di rumah itu adalah praktikal pada lain-lain waktu selain daripada semasa pandemik (Siti et al., 2021). Selaras itu, penyelidik menjalankan kajian bagi mengenal pasti sejauhmanakah domain-domain kecerdasan emosi boleh mempengaruhi norma bekerja dari rumah dalam kalangan pekerja, sebagai salah satu medium keperluan kesejahteraan emosi dalam kehidupan.

## **TINJAUAN LITERATUR**

Sebagai modal insan yang berkualiti, selain daripada fokus kepada kepakaran, pekerja juga haruslah lebih holistik dari segi etika, nilai, emosi dan perwatakan (Awada et al., 2020). Keseimbangan modal insan melalui tiga kategori iaitu keseimbangan emosi, mental dan fizikal perlu difokuskan secara optimum (Johar, 2019). Walau bagaimanapun dalam organisasi, masih terdapat pelbagai fenomena dan masalah serius yang menjejaskan persekitaran interaksi psikologi antara pekerja, yang memberi kesan negatif pada sisi emosi dan boleh menjejaskan komitmen kerja (Johar et al., 2020). Tidak dinafikan ia boleh memberikan kesan yang berpanjangan terhadap tingkah laku dan komitmen pekerja dalam organisasi (Johar, 2019; Sarawati, 2018).



Terdapat kajian lepas yang menemui kewujudan pengaruh unsur psikologi dan tingkah laku yang berkaitan dengan penghargaan sendiri serta hubungannya dengan prestasi dan komitmen dalam organisasi sebagai sumber manusia (Michael, 2010). Sehubungan dengan itu, modal insan dalam organisasi adalah sumber manusia yang terdiri daripada tiga domain utama iaitu emosi, mental dan fizikal (Johar, 2019). Ia boleh diukur sama ada bertindak selaras dengan tuntutan organisasi mahupun berlawanan, sehingga boleh menimbulkan krisis dalaman ataupun krisis luaran. Tumpuan kajian ini adalah untuk menguji elemen emosi dan pengaruhnya. Emosi merupakan suatu himpunan rasa yang dirasakan dari dalam diri setiap manusia. Emosi berasal daripada bahasa Latin yang bermaksud 'gerakan tenaga' (Childre dan Martin, 1999). Pengalaman dalam emosi akan mempengaruhi sel-sel otak dan ingatan, sehingga membentuk dan mempengaruhi tingkah laku. Sejauh manakah emosi berperanan penting serta mempunyai pengaruh ke atas norma bekerja dari rumah? Ia akan dikaji dalam kajian ini bagi menyimpulkan konstruk kesejahteraan emosi dalam kalangan penjawat awam. Seiring itu, tujuan utama kajian ini adalah untuk menguji kesan kesejahteraan emosi melalui empat domain kecerdasan emosi ke atas persepsi norma bekerja dari rumah dalam kalangan pekerja. Bekerja dari rumah semasa pandemik COVID-19 agak berbeza daripada bekerja di rumah semasa bukan tempoh pandemik.

Dalam situasi praktikal secara amnya terdapat banyak fleksibiliti antara majikan dan pekerja, termasuklah bilamana adanya elemen sukarela (Rusli, 2020). Konsep ini boleh digunakan untuk pelbagai jenis pekerjaan. Mod pelaksanaan dan mekanisme akan menjadi lebih variasi, dan semua pihak perlu mencapai persetujuan bersama dalam pelaksanaan bekerja dari rumah berdasarkan ketetapan dan alasan yang dibenarkan. Bagi sektor awam, pekeling perkhidmatan yang dikeluarkan oleh Ketua Pengarah Perkhidmatan Awam adalah dikeluarkan dari masa ke semasa berdasarkan keputusan Majlis Keselamatan Negara (MKN) semasa PKP di musim pandemik COVID-19.

Tinjauan kajian Randstad Workmonitor telah mendapati sehingga 48% responden selaku pekerja menyatakan keinginan untuk terus bekerja dari rumah dan dalam masa yang sama turut bekerja di pejabat secara berselang seli dan berkala, walaupun selepas pandemik COVID-19 berakhir (Hazwan, 2021). 14% responden pula mahu standard bekerja di rumah dikekalkan semasa pasca pandemik. Ternyata polisi kerja yang lebih fleksibel dipercayai boleh membantu meningkatkan semangat pekerja dan mengurangkan tahap tekanan. Sesetengah penyelidik dan ahli akademik berpendapat medium bekerja dari rumah perlu diteruskan kerana ia memberi kesan positif kepada beberapa keadaan seperti keperluan untuk menjaga ahli keluarga yang sakit dan berpenyakit kronik (Harris Shah, 2021). Ia dilihat sebagai suatu kaedah yang praktikal bagi membantu mengurangkan tahap tekanan yang disebabkan oleh konflik ketidakseimbangan dalam tuntutan kerja dan keluarga. Pekerja wanita pula didapati memerlukan stamina mental dan fizikal yang lebih tinggi untuk bekerja dari rumah kerana tanggungjawab lebih besar yang perlu mereka pikul sebagai ibu dan isteri (Tuty Haryanti, 2021). Sama ada suka atau tidak, pandemik COVID-19 telah banyak mengubah landskap pelaksanaan dan pengurusan cara dan ruang bekerja. Transformasi ini boleh mempengaruhi suasana tempat kerja sama ada kepada pekerja mahupun majikan. Oleh itu, tidak dapat dinafikan masa bekerja yang panjang dari rumah boleh menimbulkan cabaran dalam keseimbangan emosi, mental dan fizikal dalam kalangan pekerja (Nor `Asyikin, 2021).

Tidak dinafikan dalam implementasi norma bekerja dari rumah, terdapat beberapa cabaran seperti akses data internet yang tidak stabil, konflik pengurusan antara kerja dan keluarga dan pengurusan masa. Dalam tinjauan Vase.ai terhadap 1,100 pengguna dalam talian, 35% responden memberikan maklum balas tentang masalah akses data dan internet adalah salah satu cabaran utama semasa bekerja dari rumah (Rusli Ahmad, 2020). 77% responden pula mengakui menghadapi cabaran apabila bekerja dari rumah. Tinjauan itu juga mendedahkan bahawa hanya 9% responden yang suka bekerja dari rumah (Rusli Ahmad, 2020). Fenomena itu turut merangkumi realiti persekitaran yang semakin mendesak, pembangunan pesat, persaingan global, perubahan teknologi, ancaman pandemik serta endemik, dan tuntutan bentuk kerja kontemporari menjadikan dunia pekerjaan semakin mencabar, termasuklah dengan perubahan yang membawa kepada senario bekerja dari rumah. Ia turut berkait rapat dengan elemen emosi, yang tidak hanya tertumpu kepada soal fizikal dan mental semata-mata.

Tidak semua orang merasakan emosi yang sama, kerana tindak balas emosi seseorang bergantung kepada jenis personaliti menunjukkan emosi adalah agak sukar untuk ditentukan secara objektif (Zohar dan Marshall, 2000). Sentimen dan emosi pekerja sebagai manusia boleh berubah-ubah dengan variasi rasa seperti gembira, sedih, kecewa, putus asa atau marah. Emosi yang tidak terkawal boleh menimbulkan konflik dan masalah dalam organisasi. Disebabkan itu, pekerja perlu lebih peka

bagaimana untuk menguruskan sebarang isu dengan berkesan dan berhemah kerana kegagalan mengawal emosi boleh mempengaruhi prestasi kerja. Di sinilah dapat kita fahami tentang keperluan pekerja mempunyai emosi yang positif, bagi mempengaruhi tingkah laku yang juga positif seterusnya membentuk budaya dan semangat kerja yang positif.

Walau apapun tugas seseorang pekerja sama ada bekerja di pejabat mahupun bekerja di rumah, mereka akan membawa emosi bersama-sama dan pastinya cabaran tetap ada. Adalah penting untuk memastikan emosi tetap terkawal dalam semua situasi. Ekspresi muka, reaksi emosi dan tingkah laku mesti dapat dikawal serta pekerja mesti lebih sensitif supaya tidak memberikan kesan buruk kepada orang lain. Pekerja berstatus tinggi lebih cenderung untuk meluahkan emosi kemarahan, manakala mereka yang berstatus lebih rendah akan cenderung untuk meluahkan emosi mereka dalam bentuk kesedihan (Tiedens, 2001). Pekerja yang gembira akan menunjukkan tingkah laku dan prestasi yang baik serta mencapai hasil kerja yang lebih produktif (Wright dan Cropanzano, 2004). Emosi negatif yang menyebabkan tekanan bukan suatu petanda yang baik dalam organisasi. Kajian lepas telah banyak membuktikan kepentingan emosi dalam pekerjaan. Emosi semasa kerja dan di tempat kerja adalah berkaitan dengan kualiti interaksi antara pekerja dengan pelanggan. Dalam konteks ini, pelanggan ditafsirkan sebagai sesiapa sahaja yang berinteraksi dengan pekerja (Zapf, 2002).

Dalam senario bekerja dari rumah, berlakunya interaksi secara maya yang turut memerlukan etika dan peradaban apabila keupayaan menangani emosi sebagai sebahagian daripada pekerjaan. Pengurusan dan pengawalseliaan emosi adalah aspek yang penting dalam bidang tingkah laku organisasi, pengurusan sumber manusia, dan psikologi organisasi, terutamanya dalam kepimpinan, pengurusan konflik, proses membuat keputusan, serta usaha untuk bertindak balas terhadap perubahan organisasi (Fineman, 2003). Kecekapan emosi pula adalah kemahiran yang boleh dipelajari agar dapat meningkatkan prestasi dan komitmen bekerja. Tambahan pula, kepentingan adanya kecerdasan emosi di tempat kerja adalah berdasarkan kawalan sendiri, kesedaran sendiri, empati, motivasi, dan perhubungan sosial (Goleman, 1999). Terdapat beberapa punca lain yang boleh menyebabkan emosi negatif, khususnya tekanan dalam kalangan penjawat awam (Zafir dan Sheikh, 2014). Keseimbangan kehidupan-pekerjaan, masalah kesihatan mental, tekanan peribadi, beban kerja berlebihan, sumber dan komunikasi, pampasan dan faedah, kawalan kerja, serta aspek keselamatan kerja, turut boleh menjadi punca tekanan di tempat kerja. Perkara ini seterusnya, akan menjejaskan produktiviti organisasi secara keseluruhan. Sejajar itu, adalah perlu emosi pekerja diuruskan dengan baik dan stabil bagi mencapai kesejahteraan emosi yang boleh mempengaruhi hasil kerja lebih positif dan proaktif, sama ada bekerja di rumah mahupun di pejabat.

Kesejahteraan emosi secara takrifannya adalah merujuk kepada keadaan individu berasa baik dari segi emosi dan dapat menguruskan emosinya dengan berkesan. Kesejahteraan emosi melibatkan perasaan positif, keupayaan untuk menangani cabaran dan tekanan, dan keupayaan untuk berinteraksi secara sihat dengan orang lain. Kesejahteraan emosi turut merangkumi keupayaan untuk mengenali, memahami dan mengurus emosi yang kurang menyenangkan seperti kebimbangan, kemarahan atau tekanan. Similarnya, emosi ditakrifkan sebagai perasaan atau kesan yang berlaku apabila individu berada dalam keadaan atau interaksi yang difikirkan penting, terutama untuk kesejahteraan (Cherniss, 2001). Oleh itu, kesejahteraan emosi adalah juga suatu keadaan emosi yang merangkumi kebahagiaan dan kepuasan hidup, serta keseimbangan antara kesan positif dan negatif. Hal ini diperkukuhkan dengan kenyataan bahawa kesejahteraan emosi adalah kepuasan hidup dengan penilaian seseorang individu terhadap kehidupannya dengan merangkumi aspek afektif sama ada positif dan negatif (Bluth et al., 2017). Kesejahteraan emosi turut merupakan satu konstruk yang berkaitan dengan dua indikator afektif iaitu indikator penunjuk positif dan negatif dalam kesihatan mental (Afridah et al., 2018).

Di samping itu, skala kesejahteraan emosi merupakan petunjuk kepada tahap emosi positif yang tinggi atau rendah melalui kompetensi kecerdasan emosi. Perkaitan dengan petunjuk positif adalah seperti harga diri, kesejahteraan psikologi, dan extraversi. Manakala penunjuk negatif adalah seperti kemurungan, kebimbangan, dan neurosis (Diener, 1984). Pernyataan bahawa kesejahteraan emosi adalah komponen kesihatan mental (Budiarto, 2018) adalah selaras dengan pendapat Keyes et al. (2002). Konsep kesihatan mental positif adalah dalam rangkaian tiga dimensi iaitu kesejahteraan emosi, kesejahteraan psikologi, dan kesejahteraan sosial. Kesejahteraan emosi sangat memberikan tumpuan kepada kesejahteraan subjektif dari segi kepuasan dan kebahagiaan yang holistik dalam hidup. Kesejahteraan emosi adalah sekumpulan tanda yang mencerminkan wujud atau tidak wujudnya perasaan positif dalam kehidupan. Kesan positif itu adalah seperti keceriaan, semangat, bahagia, tenang,

damai, dan puas. Kesejahteraan turut berkaitan dengan kebahagiaan terhadap masa lalu dan masa kini secara keseluruhan atau apa sahaja yang baik dalam kehidupan (Keyes et al., 2002). Melalui norma bekerja dari rumah, kesejahteraan emosi dapat dikesan peranannya melalui kompetensi kecerdasan emosi.

Bekerja dari rumah secara konseptual adalah satu bentuk pengaturan kerja di mana individu bekerja dari lokasi rumah mereka atau tempat lain di luar pejabat fizikal syarikat (Rusli, 2020). Lazimnya, bekerja dari rumah melibatkan penggunaan teknologi maklumat dan komunikasi, seperti komputer, telefon, dan akses internet, untuk menjalankan tugas kerja. Bekerja dari rumah telah menjadi lebih norma biasa sejak beberapa tahun kebelakangan ini, terutamanya dengan kemajuan dalam teknologi yang membolehkan komunikasi jauh yang lebih cekap. Sesetengah syarikat mungkin menerima pakai dasar kerja dari rumah sebagai sebahagian daripada inisiatif keseimbangan kerja dan kehidupan, fleksibiliti kerja atau sebagai tindak balas kepada situasi kecemasan atau bencana seperti sewaktu pandemik COVID-19.

Bekerja dari rumah boleh memberikan beberapa manfaat dan faedah iaitu seperti:

- i. **Fleksibiliti masa:** bekerja dari rumah boleh memberikan fleksibiliti dalam menguruskan jadual kerja, membolehkan individu menyesuaikan masa kerja untuk memenuhi keperluan peribadi dan keluarga.
- ii. **Menjimatkan masa dan kos perjalanan:** tidak perlu berulang-alik ke pejabat membolehkan berlakunya penjimatan masa perjalanan, dan kos yang biasanya ditanggung dalam rutin harian.
- iii. **Mengelakkan tekanan:** pekerja dapat mengelakkan atau meminimumkan faktor tekanan apabila tidak perlu berhadapan dengan senario kesesakan jalan raya, kerisauan pergi dan balik bekerja yang lambat, dan kepenatan berulang-alik bekerja setiap hari.
- iv. **Keseimbangan kerja dan kehidupan peribadi:** bekerja dari rumah boleh membantu mencapai keseimbangan lebih stabil antara tuntutan kerja dengan kehidupan peribadi, kerana individu boleh menjadi lebih fleksibel dalam menguruskan masa dan masa kerja untuk aktiviti peribadi.

Walau bagaimanapun, bekerja dari rumah juga mempunyai cabarannya, seperti:

- i. **Pengasingan sosial:** bekerja dari rumah boleh mengurangkan interaksi sosial dengan rakan sekerja dan boleh membawa kepada perasaan pengasingan.
- ii. **Kecekapan pengurusan masa:** bekerja dari rumah memerlukan disiplin peribadi dalam menguruskan masa kerja, mengelakkan gangguan dan memastikan kerja kekal efisien.
- iii. **Gangguan persekitaran rumah:** persekitaran rumah boleh menjadi sumber gangguan, seperti kerja-kerja hal ehwal rumah, penjagaan anak atau haiwan peliharaan.

Ringkasnya, kecerdasan emosi yang baik membawa kepada kesejahteraan emosi adalah sangat penting dalam kehidupan termasuk dalam konteks bekerja dari rumah. Apabila individu berasa lebih stabil emosinya, mereka cenderung mempunyai tahap tekanan lebih rendah, tahap kepuasan kerja lebih tinggi, dan keseimbangan yang lebih baik antara kerja dan kehidupan peribadi. Kesejahteraan emosi yang optimum boleh meningkatkan kualiti perhubungan antara rakan sekerja, komunikasi berkesan, dan mengukuhkan daya tahan dalam menghadapi cabaran kerja. Walau bagaimanapun, bekerja dari rumah juga boleh memberikan cabaran tersendiri terhadap tahap psikologi merangkumi faktor emosi, minda, dan tingkah laku (Siti et al., 2021). Pekerja mungkin menghadapi situasi pengasingan sosial, kesukaran memisahkan masa kerja dan masa persendirian, dan peningkatan permintaan kerja tanpa mengira masa melalui interaksi maya yang boleh menjejaskan kestabilan emosi mereka. Oleh itu, adalah penting bagi individu yang bekerja dari rumah untuk mengekalkan kesejahteraan emosi mereka dengan mempunyai daya tahan yang jitu, mengamalkan strategi daya tindak yang sihat, mengekalkan keseimbangan antara kerja dan kehidupan peribadi, serta berinteraksi secara nyata bagi mendapatkan sokongan daripada keluarga, rakan sekerja dan organisasi (Siti et al., 2021). Walaupun bekerja dari rumah menampilkan kekerapan tinggi dalam interaksi maya, akan tetapi pekerja boleh meningkatkan keberkesanan komunikasi secara fizikal dengan ahli keluarga. Dengan memahami dan mengurus kesejahteraan emosi dengan baik, individu yang bekerja dari rumah boleh meningkatkan kualiti hidup serta prestasi kerja mereka secara lebih dinamik dan konsisten. Dengan itu, kajian ini dilakukan dengan tujuan untuk

meninjau pengaruh empat domain kecerdasan emosi sebagai suatu dimensi kesejahteraan emosi ke atas persepsi norma bekerja dari rumah.

## **OBJEKTIF KAJIAN**

- (1) Untuk menguji kesan domain emosi ke atas persepsi norma bekerja dari rumah.
- (2) Untuk menguji kesan domain kesedaran sendiri ke atas persepsi norma bekerja dari rumah.
- (3) Untuk menguji kesan domain kesejahteraan emosi ke atas persepsi norma bekerja dari rumah.
- (4) Untuk menguji kesan domain pengawalseliaan emosi ke atas persepsi norma bekerja dari rumah.

## **METODOLOGI KAJIAN**

### **(1) Reka Bentuk Kajian**

Kajian jenis ini adalah non-eksperimental, dan merupakan kajian lapangan, serta dihuraikan menggunakan statistik korelasi dan regresi. Kajian lapangan sangat relevan untuk kajian ini kerana ia diyakini dengan kebolehpercayaan yang tinggi serta agak rendah dalam kos pelaksanaan (Maimunah, 1992). Kajian ini adalah berbentuk deskriptif dan juga adanya pengujian hipotesis yang boleh menerangkan pembolehubah bebas dua atau lebih faktor dalam situasi tertentu (McIntyre, 2005). Analisis regresi digunakan bagi menguji pengaruh atau impak dalam hubungan kesemua pembolehubah.

### **(2) Lokasi Kajian**

Salah sebuah universiti awam di zon tengah semenanjung Malaysia, yang juga merupakan entiti badan berkanun agensi kerajaan, telah dipilih untuk lokasi kajian ini.

### **(3) Persampelan Kajian**

Salah satu kriteria utama kajian ini adalah tertumpu kepada penjawat awam. Dalam proses pemilihan sampel, kaedah persampelan rawak sistematik telah digunakan, dan jadual Krejcie & Morgan dalam memilih jumlah responden. Kajian ini memilih sampel kajian dari kategori penjawat awam seramai 235 orang, yang terdiri daripada staf akademik dan staf bukan akademik dari beberapa kategori gred gaji.

### **(4) Instrumen Kajian**

Kajian ini adalah berbentuk kajian kuantitatif. Alat ukur untuk menguji domain kecerdasan emosi merupakan soal selidik yang dibangunkan oleh penyelidik, dan telah melalui proses pengesahan konstruk, pengesahan muka dan pengesahan instrumen, dinamakan sebagai Inventori Domain Kecerdasan Emosi (EIDInv; Siti Sarawati Johar, 2021). Nilai kebolehpercayaan untuk instrumen ini adalah .947, manakala jumlah KMO adalah .918. Soal selidik untuk pemboleh ubah kedua adalah Instrumen Norma Bekerja dari Rumah, yang diadaptasi daripada Instrumen Bekerja Dari Rumah Cabaran COVID-19 (WFHI-CvdC; Siti Sarawati Johar, 2021). Kebolehpercayaan untuk instrumen ini adalah .743, manakala jumlah KMO pula adalah .819.

## **KEPUTUSAN DAN PERBINCANGAN**

### **(1) Kesan domain emosi ke atas persepsi norma bekerja dari rumah**

Jadual 1 menunjukkan dapatan kajian kesan domain emosi ke atas persepsi norma bekerja dari rumah responden. Hasil analisis mendapati domain emosi memberikan kesan yang signifikan terhadap persepsi

norma bekerja dari rumah dengan nilai sig. = .001 dan R= .237. Dapatan itu menunjukkan domain emosi menyumbangkan sebanyak 5.6% ( $R^2 = .056$ ) perubahan varians dalam persepsi norma bekerja dari rumah.

**JADUAL 1:** Kesan domain emosi ke atas persepsi norma bekerja dari rumah.

Pembolehubah	Sig.	R	R <sup>2</sup>
Domain Emosi	.001	.237	.056

(2) Kesan domain kesedaran sendiri ke atas persepsi norma bekerja dari rumah

Jadual 2 menunjukkan dapatan kajian kesan domain kesedaran sendiri ke atas persepsi norma bekerja dari rumah responden. Hasil analisis mendapati domain kesedaran sendiri memberikan kesan yang signifikan atas persepsi norma bekerja dari rumah dengan nilai sig. = .023 dan R= .148. Dapatan itu menunjukkan domain kesedaran sendiri hanya menyumbangkan sebanyak 2.2% ( $R^2 = .022$ ) perubahan varians dalam norma bekerja dari rumah.

**JADUAL 2:** Kesan domain kesedaran sendiri ke atas persepsi norma bekerja dari rumah

Pembolehubah	Sig.	R	R <sup>2</sup>
Domain Kesedaran Kendiri	.023	.148	.022

(3) Kesan domain kesejahteraan emosi ke atas persepsi norma bekerja dari rumah

Jadual 3 menunjukkan dapatan kajian kesan domain kesejahteraan emosi ke atas persepsi norma bekerja dari rumah responden. Hasil analisis mendapati domain kesedaran sendiri memberikan kesan yang signifikan atas persepsi norma bekerja dari rumah dengan nilai sig. = .001 dan R= .235. Dapatan itu menunjukkan domain kesejahteraan emosi dapat menyumbangkan sebanyak 5.5% ( $R^2 = .055$ ) perubahan varians dalam persepsi norma bekerja dari rumah.

**JADUAL 3:** Kesan domain kesejahteraan emosi ke atas persepsi norma bekerja dari rumah

Pembolehubah	Sig.	R	R <sup>2</sup>
Domain Kesejahteraan Emosi	.001	.235	.055

(4) Kesan domain pengawalseliaan emosi ke atas persepsi norma bekerja dari rumah

Jadual 4 menunjukkan dapatan kajian kesan domain pengawalseliaan emosi ke atas persepsi norma bekerja dari rumah responden. Hasil analisis mendapati domain kesedaran sendiri memberikan kesan yang signifikan atas persepsi norma bekerja dari rumah dengan nilai sig. = .001 dan R= .331. Dapatan itu menunjukkan domain pengawalseliaan emosi dapat menyumbangkan sebanyak 11% ( $R^2 = .110$ ) perubahan varians dalam persepsi norma bekerja dari rumah.

**JADUAL 4:** Kesan domain pengawalseliaan emosi ke atas persepsi norma bekerja dari rumah

Pembolehubah	Sig.	R	R <sup>2</sup>
Domain Pengawalseliaan Emosi	.001	.331	.110

Fokus kajian ini adalah untuk mengkaji domain-domain kecerdasan emosi yang boleh mempengaruhi persepsi penjawat awam terhadap norma bekerja dari rumah. Penemuan menunjukkan bahawa secara dramatikny telah memberikan impak ke atas persepsi norma bekerja dari rumah oleh domain-domain kecerdasan emosi iaitu emosi, kesedaran sendiri, kesejahteraan emosi dan

pengawalseliaan emosi. Kajian ini jelas dilakukan bagi menguji kesan dan pengaruh domain kecerdasan emosi sebagai penanda kepada kesejahteraan emosi iaitu domain yang terdiri daripada domain emosi, kesedaran sendiri, kesejahteraan emosi dan pengawalseliaan emosi dalam kalangan penjawat awam. Hasil kajian menunjukkan pengaruh domain kecerdasan emosi ke atas norma bekerja dari rumah adalah signifikan. Boleh ditafsirkan bahawa domain kecerdasan emosi mempunyai pengaruh yang signifikan dalam membantu mengekalkan elemen kestabilan emosi dan kesejahteraan emosi yang baik. Beberapa domain kecerdasan emosi tersebut telah menghasilkan pekali regresi positif yang signifikan terhadap norma bekerja dari rumah. Ia juga mengetengahkan kepentingan pendekatan pekerja yang dominan dalam usaha menguruskan kecenderungan tingkah laku positif yang selaras dengan pengawalseliaan emosi yang lebih konsisten. Pekerja yang mempunyai kecerdasan emosi sehingga mencapai kesejahteraan emosi yang baik berupaya untuk bekerja di mana-mana termasuklah di rumah kerana mereka lebih mampu mengawal persekitaran dan diri mereka sendiri. Selain itu, jika dibandingkan dengan domain lain, kesan domain pengawalseliaan emosi mempunyai pengaruh yang lebih besar ( $R = .331$ ) ke atas pemboleh ubah norma bekerja dari rumah.

Dapatan kajian ini menunjukkan bahawa domain-domain kecerdasan emosi sedikit sebanyak telah menyumbang kepada peningkatan peratus persepsi yang positif terhadap norma bekerja dari rumah dalam kalangan pekerja. Dengan tahap domain-domain kecerdasan emosi yang sederhana tinggi (min= 3.046, 3.160, 3.081, 2.643), didapati berupaya mempengaruhi tahap persepsi norma bekerja dari rumah responden untuk berada di tahap sederhana (min= 2.382). Pengaruh domain-domain kecerdasan emosi telah menghasilkan pekali regresi yang signifikan positif terhadap persepsi norma bekerja dari rumah. Ringkasnya, domain-domain kecerdasan emosi dapat berfungsi sebagai pemboleh ubah yang boleh meningkatkan rasa yang positif terhadap senario dan dasar bekerja dari rumah dalam kalangan responden, agar ia tidak menjurus kepada tahap emosi yang negatif, sehingga boleh menjejaskan kestabilan emosi dan kesihatan mental responden secara tidak langsung. Keupayaan mengendalikan tekanan dalam diri dalam apa keadaan dan ruang bekerja menjadi pemangkin kepada kesejahteraan emosi. Boleh diterjemahkan daripada situasi ini tentang keperluan pekerja di tahap kecerdasan emosi yang konsisten adalah sebagai antara usaha untuk menyokong daya tahan pekerja apabila bekerja dari rumah semasa pandemik atau bukan semasa pandemik. Hasil dapatan kajian ini juga sebahagiannya konsisten dengan hasil kajian lepas yang menegaskan kecerdasan emosi amat signifikan mempengaruhi tahap tekanan dan prestasi pekerja apabila bekerja dari rumah (Shivangi, 2020). Mempunyai ahli organisasi yang bijak emosi boleh memberikan kelebihan dalam tingkah laku berdaya saing dan berdaya tahan. Ringkasnya, ekosistem bekerja dari rumah turut boleh memberikan impak terhadap sejauh mana pekerja dapat memahami, mengurus dan mengawalselia pelbagai emosi seperti kebimbangan, kesedihan, keyakinan dan estim sendiri, walaupun selepas pandemik COVID-19.

Individu yang bekerja dari rumah memerlukan kecerdasan emosi yang jitu dan tinggi untuk terus menjalankan tugas, serta agar dapat mengelak daripada berlakunya penyelewengan kerja. Hasil kajian terdahulu secara meluas menunjukkan bahawa pekerja yang bekerja jauh daripada ruang bekerja secara formal yang sebenarnya, memerlukan tahap kecerdasan emosi yang tinggi untuk menangani kesukaran melaksanakan tugas mereka apabila berlaku sesuatu masalah atau pandemik. Ini penting memerlukan keupayaan mengendalikan emosi. Terdapat beberapa isu berkaitan dengan interaksi, pengurusan kerja dan kualiti kerja apabila bekerja dari rumah. Individu yang mempunyai kecerdasan emosi yang kuat boleh menjadi lebih bertanggungjawab dalam kerja mereka dan tidak memerlukan penyeliaan untuk mengekalkannya mengikut standard (Zapf, 2002). Individu yang bekerja dari rumah juga mempunyai keseimbangan kerja yang hebat, apabila mereka boleh menggunakan masa berkualiti bersama keluarga mereka dan pada masa yang sama boleh melibatkan diri dalam minat atau hobi mereka (Shivangi, 2020). Walaupun tidak dinafikan ada waktunya bahawa mungkin agak sukar untuk mengutamakan kerja dan menjana kerja berkualiti tinggi apabila bekerja dari rumah.

Keupayaan untuk menangani kriteria kestabilan emosi tersebut juga konsisten dengan domain kecerdasan emosi yang dibangunkan oleh Bar-On pada tahun 1997 dalam Model Bar-On yang mengandungi subdomain berkaitan dengan pengurusan tekanan (Bar-On, 1997). Beliau menekankan bahawa individu yang mempunyai kecerdasan emosi yang tinggi hampir selalu tahu cara menangani tekanan dengan baik. Keadaan ini juga boleh memberi penekanan kepada kepentingan seseorang yang mampu mengawal emosi mereka yang tidak menentu, serta tetap boleh bereaksi dengan baik walaupun di bawah tekanan. Dapatan kajian ini juga selari dan menyokong kajian Salovey dan Sluyter (1997), yang mendapati individu yang mempunyai tahap kecerdasan emosi yang tinggi mempunyai peraturan

emosi yang lebih baik dan mampu menangani emosi yang melibatkan orang lain (Johar et al., 2018, Johar et al., 2020). Di samping itu, dapatan kajian ini turut sejajar dengan hasil kajian Salovey dan Mayer (1990) kerana telah mendapati individu yang mempunyai kecerdasan emosi yang tinggi lebih mampu untuk mengurus, mengendali dan mengawalselia emosi. Dapatan kajian ini hampir senada dengan dapatan kajian Randstad Workmonitory yang mendapati sebanyak 48% responden mahu kaedah bekerja dari rumah dan bekerja di pejabat diteruskan secara kombinasi pasca pandemik COVID-19. Manakala sebanyak 14% responden mahu amalan bekerja dari rumah diteruskan (Hazwan, 2021). Situasi ini jelas menekankan tentang keupayaan individu dalam menguruskan tekanan adalah individu yang berupaya mencapai kesejahteraan emosi serta berkebolehan untuk bekerja dengan baik dan terkawal, walaupun perlu bekerja di rumah ataupun berhadapan dengan suasana yang penuh dengan cabaran.

## **RUMUSAN**

Kesimpulannya, hasil kajian ini menunjukkan fenomena pandemik COVID-19 telah merintis senario dan norma bekerja dari rumah dan ia mempunyai kesannya yang tersendiri kepada golongan pekerja, termasuklah penjawat awam. Namun begitu, kesan itu boleh distabilkan dengan adanya kesedaran dan kepekaan untuk menguruskan dan mengendalikan tahap emosi dengan lebih terkawal agar berupaya menyumbangkan kesejahteraan emosi yang konsisten, ataupun menyumbangkan tahap yang lebih rendah untuk ketidakstabilan emosi dalam kalangan pekerja. Keupayaan menjaga kesejahteraan emosi, minda dan fizikal bagi mencapai kesejahteraan secara holistik didapati boleh membantu pekerja berada dalam keadaan yang lebih tenang dan terkawal dengan memiliki daya tahan diri berhadapan dengan cabaran.

Pekerja yang dapat mengawalselia emosi dan mencapai kesejahteraan emosi lebih diyakini dapat berada dalam keadaan tenang dan terkawal, seperti yang ditunjukkan oleh regresi domain kecerdasan emosi terhadap persepsi bekerja dari rumah dalam kajian ini. Keperluan ini memang perlu diketengahkan kepentingan implementasinya walaupun dalam keadaan persekitaran yang sukar dan mencabar. Dalam kajian ini, adalah dicadangkan agar penyelidik lain yang berminat juga boleh mengujipakai dan menggunakan instrumen kecerdasan emosi yang digunakan dalam kajian ini kerana ia telah dibina dengan berkesan, telah mendapat kesahan dan kebolehpercayaan yang tinggi. Adalah juga dicadangkan agar mana-mana agensi kerajaan akan datang menggunakan rumusan kajian ini sebagai panduan. Dalam usaha semua untuk menyesuaikan diri dengan perubahan evolusi situasi, masa, budaya, teknologi dan beban kerja organisasi, adalah dicadangkan agar penyelidikan seterusnya juga dapat mengadaptasikan pengukuran kecerdasan emosi dan persepsi bekerja dari rumah yang lebih mudah ditadbir, tidak rumit difahami, lebih terbuka dan bersifat kontemporari yang dinamik.

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## MULTI-DIMENSI KEMUDAHERANCAMAN PENTERNAK IKAN SANGKAR DI SUNGAI PAHANG

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### ABSTRAK

*Kepentingan sektor perikanan kepada negara dapat dibincangkan dalam tiga faktor iaitu sebagai pembekal sumber protein makanan penduduk; penciptaan peluang pekerjaan khususnya kepada golongan berpendapatan rendah dan ketiga sebagai sumber kekayaan negara. Akuakultur sebagai salah satu sub sektor perikanan semakin penting sebagai pelengkap kepada perikanan marin yang berhadapan dengan kekurangan stok dan jumlah pendaratan ikan yang semakin berkurangan. Sumbangan akuakultur ikan air tawar kepada industri akuakultur masih kecil namun ianya semakin berkembang. Pahang merupakan salah sebuah negeri utama pengeluar akuakultur ikan air tawar yang penting di mana seramai 1,068 penternak ikan direkodkan pada tahun 2019. Sementara itu, Sungai Pahang yang merupakan sungai yang terpanjang di Semenanjung Malaysia menjadi nadi kehidupan penting kepada penduduk tempatan terutamanya yang melakukan aktiviti perikanan sama ada nelayan darat dan penternak ikan sangkar. Persekitaran semulajadi Sungai Pahang yang sesuai untuk menjalankan aktiviti penternakan ikan telah memberi peluang kepada penduduk setempat memanfaatkannya untuk menjana pendapatan. Dalam menjalankan aktiviti ternakan, golongan penternak ikan berhadapan dengan pelbagai ancaman yang menjejaskan aktiviti penternakan dan kelestarian kehidupan. Kertas ini bertujuan untuk mengenalpasti faktor-faktor kemudahterancaman yang menjejaskan aktiviti penternakan ikan sangkar di Sungai Pahang. Kaedah survei digunakan bagi mendapatkan data primar dan seramai 260 penternak ikan di sepanjang Sungai Pahang telah ditemubual dengan menggunakan instrumen soal selidik. Kajian mendapati penternak ikan sangkar berhadapan multi-dimensi kemudahterancaman yang disumbangkan oleh faktor ekonomi, sosio-fizikal, dan alam sekitar. Analisis penerokaan digunakan dalam mengenalpasti faktor-faktor kemudahterancaman yang dihadapi oleh penternak ikan sangkar. Hasil keputusan menunjukkan lapan faktor kemudahterancaman dihadapi oleh penternak. Daripada 27 item, hasil keputusan menunjukkan 22 item telah melebihi nilai muatan (loading factor) iaitu 0.5 dan ke atas.*

*Kata kunci: Multi-dimensi kemudahterancaman; penternak ikan sangkar; kehidupan lestari; analisis penerokaan Sungai Pahang.*

### ABSTRACT

*The importance of the fisheries sector to the country can be discussed in three factors, namely as a supplier of protein sources for the population's food; the creation of job opportunities especially for low-income groups; and third as a source of national wealth. Aquaculture as one of the sub-sectors of fisheries is increasingly important as a complement to marine fisheries that are faced with a shortage of stocks and the number of fish landings that are decreasing. The contribution of freshwater fish aquaculture to the aquaculture industry is still small but it is growing. Pahang is one of the main states producing important freshwater fish aquaculture where a total of 1,068 fish farmers were recorded in 2019. Meanwhile, the Sungai Pahang, which is the longest river in Peninsular Malaysia, is the heart of life for local residents, especially those who do fishing activities. there are land fishermen and cage fish farmers. The natural environment of Sungai Pahang which is suitable for carrying out fish farming activities has given local residents the opportunity to utilize it to generate income. In carrying out livestock activities, fish farmers are faced with various threats that affect farming activities and the*

*sustainability of life. This paper aims to identify vulnerability factors that affect cage fish farming activities in Sungai Pahang. A survey method was used to obtain primary data and a total of 260 fish farmers along the Sungai Pahang were interviewed using a questionnaire. The study found that cage fish farmers exposed to multi-dimensional vulnerability contributed by economic, socio-physical, and environmental factors. Explanatory Analysis is used to identify the vulnerability factors faced by cage fish farmers. The results show that fish farmers have faced eight vulnerability factors. Out of 27 items, the results show that 22 items have passed the loading factor of 0.5 and above.*

*Keywords: Multi-dimensional vulnerability; cage fish farmers; sustainable livelihood; explanatory analysis; Sungai Pahang*

## **PENGENALAN**

Sektor perikanan merupakan salah satu sektor ekonomi penting kepada negara. Sektor ini terbahagi kepada tiga komponen iaitu sub-sektor perikanan marin, sub-sektor perikanan darat dan sub-sektor akuakultur. Pada tahun 2018, sektor perikanan telah menyumbang sebanyak 22.25 peratus kepada Keluaran Dalam Negara Kasar (KDNK) Malaysia, dengan nilai RM14.5 bilion. Manakala sektor ini telah mencatatkan pengeluaran sebanyak 1.85 juta tan metrik dan kadar mampu diri kira-kira 92.8 peratus pada tahun yang sama. Sementara itu nilai sumbangan aktiviti perikanan darat dan akuakultur masih kecil berbanding perikanan marin iaitu masing-masing RM124.4 juta dan RM3.1 bilion. Namun dua sub-sektor ini berpotensi untuk berkembang di masa hadapan dalam menyumbang kepada keperluan protin penduduk dan juga pendapatan negara. Seiring dengan cabaran perikanan marin untuk memenuhi bekalan ikan negara, kerajaan menerusi Dasar Agromakanan 2.0 (2021-2030) telah memberi penekanan untuk meningkatkan pelaburan di dalam industri akuakultur.

Pahang merupakan salah sebuah negeri utama pengeluar akuakultur ikan air tawar yang penting di mana seramai 1,068 penternak ikan direkodkan pada tahun 2019. Sementara itu, Sungai Pahang yang merupakan sungai yang terpanjang di Semenanjung Malaysia telah nadi kehidupan penting kepada penduduk tempatan terutamanya yang melakukan aktiviti perikanan sama ada nelayan darat dan penternak ikan sangkar. Persekitaran semulajadi Sungai Pahang yang sesuai untuk menjalankan aktiviti penternakan ikan telah memberi peluang kepada penduduk setempat untuk memanfaatkannya untuk menjana pendapatan. Deretan sangkar ikan dipasang berhampiran tebing sungai oleh penternak sama ada penternak kecil-kecilan dan juga berskala besar-besaran. Dalam menjalankan aktiviti ternakan, golongan penternak ikan berhadapan dengan pelbagai ancaman yang menjejaskan aktiviti penternakan dan kelestarian kehidupan. Justeru, kajian ini bertujuan untuk mengenalpasti faktor-faktor kemudahterancaman yang menjejaskan aktiviti penternakan ikan sangkar di Sungai Pahang.

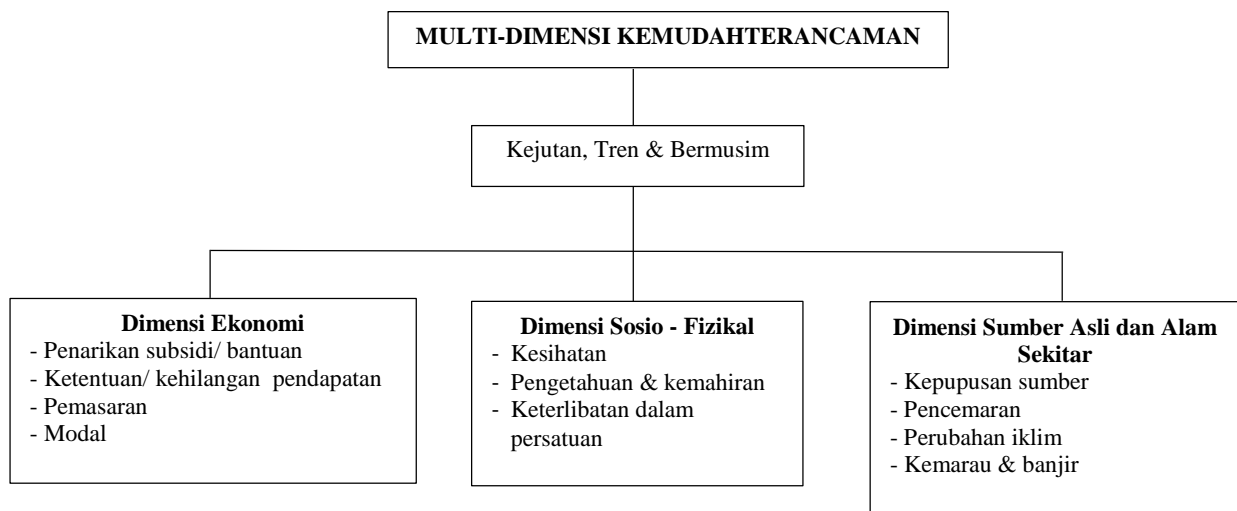
Daripada segi pilihan ikan yang ditanam, ikan tilapia dan ikan patin hitam merupakan dua spesis ikan yang banyak ditanam di Sungai pahang. Permintaan yang tinggi daripada pengguna serta rasa ikan yang enak merupakan dua faktor utama yang mendorong penternak memberi tumpuan kepada spesis ini. Faktor pengurusan ikan yang lebih mudah dan cepat dituai turut memainkan peranan penting terhadap penternakan ikan ini.

## **KEMUDAHTERANCAMAN**

Konsep kemudahterancaman telah dibincangkan secara meluas di dalam wacana akademik dan pendefinisian adalah berbeza mengikut bidang dan konteks kajian atau penyelidikan. Dalam bidang kajian pembangunan khususnya pembangunan luar bandar, kemudahterancaman merupakan satu daripada lima komponen atau elemen penting di dalam Kerangka Analisis Penghidupan Lestari (*Sustainable Livelihood Analysis- SLA*). Penghidupan lestari merujuk kepada kebolehan dan keupayaan untuk mengatasi dan pulih daripada tekanan dan kejutan, mengekalkan atau meningkatkan keupayaan dan asetnya, dan menyediakan peluang kehidupan yang mampan untuk generasi akan datang; dan yang menyumbang faedah bersih kepada kehidupan lain di peringkat tempatan dan global dan dalam jangka

panjang dan pendek. Ia mengandungi lima komponen/ elemen iaitu konteks kemudahterancaman; pemilikan aset; transformasi struktur dan proses; strategi kehidupan; dan hasil kehidupan.

Konteks kemudahterancaman di dalam kerangka penghidupan lestari terdiri daripada kejutan, tren dan bermusim (Chambers and Conway,1992; Scoones,1998; DFID,1999). Menurut DFID (1999), kemudahterancaman adalah persekitaran luaran yang wujud sama ada secara terkawal atau tanpa kawalan. Kemudahterancaman dibincangkan dalam tiga bentuk iaitu kejutan, tren dan bermusim. Kemudahterancaman kejutan adalah seperti kematian secara tiba-tiba, kemarau, bencana alam, konflik dan peperangan, kemalangan, kenaikan harga barangan, penurunan mata wang dan serangan penyakit bagi ternakan dan tanaman. Kemudahterancaman berbentuk tren termasuklah penurunan hasil pengeluaran pertanian, perubahan populasi, penyakit, perubahan teknologi dan kenaikan kos pengeluaran. Manakala kemudahterancaman berbentuk bermusim seperti kenaikan harga barangan, pengeluaran, kesihatan, kecukupan makanan dan peluang pekerjaan.



Sumber: Olahan Penulis (2023)

### RAJAH 1. Multi-Dimensi Kemudahterancaman

Kemudahterancaman mempunyai pelbagai definisi dan istilah yang diguna pakai oleh pengkaji-pengkaji yang lepas mengikut bidang dan kesesuaian pengkaji penghidupan lestari. Antara istilah yang sering diguna pakai adalah kemudaterancaman, kerentanan tindakbalas, daya tahan, adaptasi, keupayaan beradaptasi, risiko, bahaya dan lain-lain (IPCC 2001; Adger et al. 2002).

Henninger (1998), menjelaskan kemudahterancaman sebagai kerentanan individu, isi rumah atau komuniti berhadapan dengan kejutan daripada luaran dan tidak dijangkakan. Terdapat lima risiko utama kemudahterancaman yang dihadapi individu iaitu risiko politik, risiko ekonomi, risiko sosial, risiko penyakit dan risiko alam sekitar. Moser dan McIlwaine (1997) menyatakan kemudahterancaman merujuk kepada ketidakselamatan dalam kesejahteraan individu, isi rumah atau komuniti yang berhadapan dengan perubahan persekitaran perubahan persekitaran merujuk kepada situasi yang boleh mengancam kebajikan isi rumah seperti ekologi, ekonomi, sosial dan politik. Serrat (2008) pula, menjelaskan kemudahterancaman berhadapan dengan dua keadaan iaitu faktor luaran dan faktor dalaman. Kemudahterancaman faktor luaran adalah seperti kejutan, bermusim dan tren manakala kemudahterancaman faktordalaman seperti ketidakupayaan isi rumah untuk mencapai kesejahteraan dalam kehidupan. Rospidah (2017) pula, menyatakan golongan berpendapatan rendah terdedah kepada multi-dimensi kemudahterancaman yang boleh menjejaskan kehidupan mereka.

## METODOLOGI

Reka bentuk kajian ini ialah kajian tinjauan dengan menggunakan pendekatan kuantitatif. Soal selidik digunakan sebagai alat pengumpulan data secara terus daripada responden kajian kerana proses pengumpulan data dapat dikendalikan dengan efisien dan maklumat dapat diperolehi dengan cepat.

(Creswell, 2012). Proses membangunkan soal selidik yang lengkap dan jitu melibatkan proses dan protokol yang sistematik. Sorotan kajian lepas dilakukan yang melibatkan bahan rujukan seperti artikel jurnal, laporan-laporan penyelidikan dan terbitan Jabatan Perikanan dan lain-lain bahan yang berkaitan. Temubual secara semi struktur yang melibatkan Jabatan Perikanan Negeri Pahang, Ketua Daerah Perikanan di lima daerah kajian iaitu Jerantut, Temerloh, Bera, Maran dan Pekan banyak membantu pembinaan soal selidik. Temubual juga dilakukan bersama beberapa nelayan dan penternak serta pembekal input bagi mendapatkan maklumat berkaitan kajian. Maklumat daripada pelbagai sumber ini disaring, disusun dan diolah bagi membangunkan struktur soal selidik. Borang soal selidik terdiri daripada profil responden dan faktor kemudahterancaman. Bagi pembinaan konstruk kemudahterancaman, sejumlah 27 item telah dibina yang mana mengandungi tiga dimensi iaitu ekonomi, sosial/fizikal dan sumber asli dan alam sekitar. 27 item yang membentuk tiga konstruk dipilih berdasarkan sorotan kajian-kajian lepas, hasil pemerhatian dan temubual bersama penternak dan beberapa pihak berkepentingan yang terlibat secara langsung dengan aktiviti ini.

### Dimensi dan Indikator

Dimensi ekonomi terdiri daripada 10 item, dimensi sosial/fizikal terdiri daripada 8 item dan dimensi sumber asli dan alam sekitar terdiri daripada 9 item. Senarai pemboleh ubah konstruk kemudahterancaman seperti dalam Jadual 1. Skala selang dari 1 (sangat tidak bersetuju) hingga 10 (sangat bersetuju) telah digunakan bagi mendapatkan maklum balas responden terhadap setiap pernyataan yang diberikan.

**JADUAL 1.** Pemboleh ubah faktor kemudahterancaman penternak ikan sangkar

Dimensi	Kod	Indikator/Item
Ekonomi	EK1	Ancaman ketidaktentuan pendapatan
	EK2	Ancaman kehilangan pendapatan.
	EK3	Ancaman kenaikan harga barang keperluan asas/makanan
	EK4	Ancaman kenaikan kos penternakan/pengeluaran
	EK5	Ancaman kekurangan modal bagi mengembangkan pekerjaan
	EK6	Ancaman kenaikan kos penyelenggaraan peralatan penternakan
	EK7	Ancaman menjual hasil tangkapan/ternakan
	EK8	Ancaman/ kesukaran memasarkan hasil tangkapan
	EK9	Ancaman persaingan kawasan penternakan
	EK10	Masalah untuk membayar balik pinjaman (kewangan/bukan kewangan)
Sosial/Fizikal	SF1	Ancaman kecurian ikan atau menceroboh kawasan
	SF2	Ancaman tiada persatuan untuk penternak
	SF3	Kerosakan/kemusnahan peralatan ikan
	SF4	Ancaman kesihatan menjejaskan pekerjaan (utama/sampingan)
	SF5	Masalah keyakinan dan motivasi diri dalam melaksanakan pekerjaan
	SF6	Kekurangan bilangan penternak ikan
	SF7	Masalah keluarga yang menjejaskan emosi (R)
	SF8	Masalah kejiwaan/masyarakat
Sumber Asli dan Alam Sekitar	SA1	Ancaman stok ikan berkurangan
	SA2	Ancaman kemarau
	SA3	Ancaman banjir/tengkujuh
	SA4	Pasang surut air
	SA5	Ancaman pencemaran sungai
	SA6	Ancaman kayu hanyut

Dimensi	Kod	Indikator/Item
	SA7	Ancaman serangan penyakit ternakan
	SA8	Ancaman kematian ternakan
	SA9	Ancaman serangan haiwan liar (contoh: memerang)

Dapatan dari kajian ini dianalisis dengan menggunakan *Statistical Package for the Social Sciences* (SPSS) versi 26. Sampel kajian terdiri daripada 260 orang penternak ikan yang melibatkan lima daerah di Pahang iaitu Jerantut, Pekan, Maran, Bera dan Temerloh. Hair et al. (2014) mencadangkan sekurang-kurangnya 100 sampel atau kadar 5 atau 20 kali bilangan pemboleh ubah untuk mendapatkan keputusan yang sah bagi analisis faktor penerokaan. Perkara ini turut disebut dalam kajian yang dijalankan oleh Awang (2016) dan Moktar et al. (2022).

### Analisis Faktor Penerokaan

Bagi menentukan kesahan konstruk instrumen dalam kajian ini, Analisis Faktor Penerokaan (EFA) dijalankan menerusi Analisis Komponen Prinsipal (PCA) dan putaran varimax menggunakan *Kaiser Normalization* untuk meminimumkan korelasi antara faktor dan memaksimumkan korelasi dalam faktor (Nunnally, 1978). Indeks pengukuran bagi Kaiser-Meyer-Olkin (KMO) telah diperiksa bagi menentukan kesesuaian data serta menentukan sama ada analisis faktor boleh diteruskan atau sebaliknya. Nilai KMO yang menghampiri 1.0 dianggap nilai yang baik memandangkan ia dapat menghasilkan faktor yang dipercayai dan mempunyai perbezaan di antara satu sama lain (Tabachnik & Fidel, 2007). Pengkaji juga turut menyemak keputusan *Bartlett Test of Sphericity* sama ada ia adalah signifikan atau tidak selain mengesahkan hubungan di antara pemboleh ubah. Bagi ujian *Bartlett's Test of Sphericity* tersebut, nilai signifikan yang diperlukan adalah  $P < 0.05$ . Seterusnya, dalam menentukan bilangan faktor yang terekstrak daripada analisis faktor penerokaan, pengkaji turut meneliti nilai Kaiser-Guttman (nilai eigen  $> 1$ ). Kesemua kaedah yang digunakan ini dianggap tepat dalam menentukan bilangan faktor yang telah terekstrak.

Penentuan saiz bagi pemberat faktor yang bersesuaian juga diperlukan untuk menghasilkan analisis faktor pengukuran terbaik. Menurut Hair et al. (2014), bagi item yang mempunyai kriteria seperti memberat kepada dua atau lebih faktor, nilai faktor muatan berada di bawah saiz signifikan yang ditetapkan dan nilai komunaliti yang rendah, maka ia perlulah melalui proses penilaian semula iaitu sama ada ingin mengekalkan atau menggugurkan sahaja item daripada instrumen yang dibina. Untuk mengenal pasti item-item yang digunakan bagi satu komponen tersebut, nilai faktor muatan perlulah melebihi had nilai minima 0.5. Seandainya nilai faktor muatan kurang daripada 0.5, maka item tersebut perlu disingkirkan daripada digunakan dalam kajian. Jadual 2 menunjukkan ringkasan bagi syarat minimum untuk analisis faktor penerokaan.

**JADUAL 2.** Syarat minimum untuk Analisis Faktor Penerokaan

	Nilai yang dicadangkan
Ujian Keseferaan Barlett (Bartlett's test of sphericity)	$< 0.05$
Kecukupan sampel / Kaiser-Meyer-Olkin (KMO)	$\geq 0.50$
Nilai faktor pemberat (Factor loading)	$\geq 0.50$
Keseragaman (Communalities)	$\geq 0.30$
Nilai Eigen (Eigen value)	$\geq 1.00$
Peratus sumbangan varians terhadap faktor	$\geq 50\%$

Sumber: Hair et al. (2010; 2014)

## DAPATAN DAN PERBINCANGAN

### Analisis Profil Responden

Merujuk kepada Jadual 3, seramai 260 orang responden terlibat dalam kajian ini. Perkerjaan utama responden terdiri daripada penternak ikan sangkar iaitu sebanyak 79.6 peratus, guru sebanyak 2.3 peratus dan bekerja sendiri sebanyak 1.5 peratus. Responden yang bekerja sebagai nelayan dan peniaga masing-masing adalah 1.3 peratus. Sebanyak 14.2 peratus responden mewakili lain-lain pekerjaan. Sebanyak 12.3 peratus responden dari daerah Jerantut, 26.9 peratus dari Temerloh, 7.7 peratus dari Bera, 3.5 peratus dari Maran dan 49.6 peratus dari daerah Pekan. Majoriti responden iaitu 89.6 peratus merupakan lelaki manakala 10.4 peratus responden merupakan wanita.

Dari segi umur, responden berumur lingkungan 36 - 45 tahun merekodkan peratusan tertinggi iaitu 29.2, diikuti dengan responden berumur lingkungan 26 - 35 tahun sebanyak 23.8 peratus. Responden berumur lingkungan umur 46 - 55 tahun dan 56 - 65 tahun masing-masing adalah 18.1 peratus. Manakala kumpulan umur 25 tahun dan ke bawah merekodkan sebanyak 7.3 peratus dan hanya 19.6 peratus responden berada dalam kumpulan umur 65 tahun ke atas. Seterusnya majoriti responden yang telah berkahwin adalah sebanyak 80.4 peratus, diikuti dengan golongan bujang sebanyak 18.1 peratus dan selebihnya 1.5 peratus responden merupakan golongan duda atau janda. Pembahagian responden mengikut kaum, kajian menunjukkan bangsa Melayu mencatatkan bilangan responden yang terbanyak iaitu sebanyak 78.9 peratus diikuti bangsa Cina sebanyak 1.5 peratus, 0.4 peratus dari Orang Asli dan 19.2 peratus berbangsa Kemboja (Melayu-Champa). Majoriti responden beragama Islam iaitu sebanyak 98.5 peratus manakala baki 1.5 peratus beragama Buddha.

Dari aspek pendidikan, sebanyak 37.7 peratus responden mempunyai kelulusan peringkat SPM, sekolah rendah dan sekolah menengah masing-masing 18.5 peratus dan 18.1 peratus, manakala responden berkelulusan STPM/Diploma sebanyak 13.5 peratus. Selebihnya, 3.8 peratus berkelulusan Ijazah/Master/PHD dan 3.8 peratus tidak pernah ke sekolah. Sebanyak 4.6 peratus berkelulusan lain-lain seperti pengajian pondok dan sijil kemahiran. Manakala, seramai 16 orang responden (6.2 peratus) mendapat pendidikan formal sebagai penternak.

**JADUAL 3.** Profil Responden

Kategori	Sub-kategori	Kekerapan	Peratusan
Pekerjaan Utama	Penternak Ikan	207	79.6
	Nelayan	3	1.2
	Bekerja Sendiri	4	1.5
	Peniaga	3	1.2
	Guru	6	2.3
	Lain-lain	37	14.2
Pekerjaan Sampingan	Penternak Ikan	53	20.4
	Nelayan	26	10.0
	Peniaga	25	9.6
	Lain-lain	156	60.0
Daerah	Jerantut	32	12.3
	Temerloh	70	26.9
	Bera	20	7.7
	Maran	9	3.5
	Pekan	129	49.6
Jantina	Lelaki	233	89.6

Kategori	Sub-kategori	Kekerapan	Peratusan
	Perempuan	27	10.4
Umur	25 tahun dan ke bawah	19	7.3
	26 – 35 tahun	62	23.8
	36 - 45 tahun	76	29.2
	46 - 55 tahun	47	18.1
	56 - 65 tahun	47	18.1
	65 tahun ke atas	9	3.5
Bangsa	Melayu	205	78.9
	Cina	4	1.5
	Orang Asli	1	0.4
	Lain-lain	50	19.2
Status Perkahwinan	Berkahwin	209	80.4
	Bujang	47	18.1
	Lain-lain	4	1.5
Agama	Islam	256	98.5
	Buddha	4	1.5
Tahap Pendidikan	Sekolah Rendah	48	18.5
	Sekolah Menengah	47	18.1
	SPM	98	37.7
	STPM/ Diploma	35	13.5
	Ijazah/ Master/ PHD	10	3.8
	Tidak bersekolah	10	3.8
	Lain-lain	12	4.6

### Analisis Kebolehpercayaan

Analisis kebolehpercayaan dilakukan bagi mengetahui sejauh mana tahap kebolehpercayaan data yang diperoleh di dalam kajian ini. Kebolehpercayaan dalaman item telah dikira dengan melihat pada nilai Cronbach Alpha. Ukuran kebolehpercayaan instrumen yang diterima pakai dalam kajian ini ialah apabila nilai Cronbach Alpha melebihi 0.60. Menurut Hinton et al. (2004), julat nilai Cronbach Alpha 0.50 hingga 0.70 menunjukkan kebolehpercayaan yang sederhana namun statistik ini masih boleh diterima untuk kajian penerokaan. Merujuk Jadual 4, nilai Cronbach Alpha bagi keseluruhan konstruk kemudahterancaman adalah 0.856. Manakala nilai Cronbach Alpha bagi dimensi ekonomi (0.761), sosial/fizikal (0.716) dan sumber asli dan alam sekitar (0.688).

**JADUAL 4.** Nilai Kebolehpercayaan Cronbach Alpha

Konstruk	Dimensi	Bilangan item	Nilai Cronbach Alpha
Kemudahterancaman		27	0.856
	Ekonomi	10	0.761
	Sosial/Fizikal	8	0.716



Sumber Asli dan Alam Sekitar	9	0.688
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**Analisis Faktor Penerokaan**

Analisis Faktor Penerokaan dimulakan dengan melakukan *Bartlett's Test of Sphericity* dan kecukupan pensampelan ke atas tiga faktor kemudahterancaman. Berdasarkan Jadual 5, nilai ujian KMO bagi kemudahterancaman ekonomi ialah 0.733, kemudahterancaman sosial/fizikal ialah 0.715 dan kemudahterancaman sumber asli dan alam sekitar ialah 0.669. Dapatan yang diperolehi telah melebihi nilai minima 0.6 sebagaimana yang telah dicadangkan oleh Awang (2010; 2012) dan Hoque et al. (2016; 2017). Hal ini menunjukkan bahawa data tidak mempunyai masalah multicollinearity yang serius. Ujian *Bartlett's Test of Sphericity* digunakan bagi mengenal pasti sama ada korelasi antara item memadai untuk dilakukan analisis faktor. Hasil ujian *Bartlett's Test of Sphericity* bagi ketiga-tiga faktor kemudahterancaman adalah signifikan iaitu nilai  $p < 0.05$ . Hasil menunjukkan bahawa korelasi antara item-item memadai untuk dilakukan analisis faktor. Oleh itu, kedua-dua dapatan (nilai KMO  $> 0.6$  dan Ujian *Bartlett's Test of Sphericity* signifikan) menunjukkan data yang dicerap adalah sesuai untuk perosedur seterusnya dalam Analisis Penerokaan Faktor (EFA).

**JADUAL 5.** Nilai pengukuran Kaiser-Meyer-Olkin dan Ujian Keseferaan Bartlett

Dimensi Kemudahterancaman	KMO (Measure of Sampling Adequacy)	Bartlett's Test of Sphericity		
		Approx. Chi-square	df	Sig.
Ekonomi	0.733	898.392	45	0.000
Sosial/ Fizikal	0.715	342.902	15	0.000
Sumber Asli dan Alam Sekitar	0.669	324.343	36	0.000

Peratus varian yang dijelaskan dalam Jadual 6 menunjukkan faktor kemudahterancaman ekonomi mempunyai 3 komponen dengan nilai eigen berada pada nilai antara 1.741 hingga 2.441. Jumlah keseluruhan varian bagi kemudahterancaman ekonomi adalah sebanyak 64.587%. Kemudahterancaman sosial/fizikal mempunyai 2 komponen dengan nilai eigen 1.437 dan 1.741. Jumlah keseluruhan varian bagi kemudahterancaman sosial/fizikal sebanyak 60.506%. Kemudahterancaman sumber asli dan alam sekitar juga mempunyai 2 komponen dengan nilai eigen 1.707 dan 1.582. Jumlah keseluruhan varian bagi kemudahterancaman sumber asli dan alam sekitar ialah 54.821%. Jumlah varian yang dijelaskan bagi ketiga-tiga kemudahterancaman adalah memadai dan boleh diterima kerana melebihi 50% minimum yang ditetapkan (Hair et al. 2014).

**JADUAL 6.** Jumlah Varian yang Dijelaskan

Dimensi	Komponen	Rotation sums of squared loadings		
		Jumlah	% Varian	% Terkumpul
Ekonomi	1	2.441	24.406	24.406
	2	2.278	22.776	47.182
	3	1.741	17.406	64.587
Sosial/Fizikal	1	2.194	36.563	36.563
	2	1.437	23.942	60.506
Sumber Asli dan Alam Sekitar	1	1.707	28.451	28.451
	2	1.582	26.370	54.821

Jadual 7 menunjukkan keputusan prosedur Komponen Matrik Berputar (*Rotated Component Matrix*) dengan putaran varimax. Hasil keputusan mendapati bahawa terdapat beberapa item (SF2, SF6, SA1, SA4 dan SA5) telah digugurkan kerana mempunyai nilai faktor muatan kurang daripada 0.5 manakala

item-item lain dikekalkan dan dikelompokkan mengikut faktor-faktor yang ditetapkan seperti di Jadual 7.

### **Faktor Kemudahterancaman Ekonomi**

Kemudahterancaman ekonomi mempunyai tiga komponen. Nilai faktor muatan telah mencapai nilai yang ditetapkan ( $>0.50$ ) iaitu di antara 0.502 hingga 0.889. Terdapat empat item (EK4, EK6, EK5 dan EK3) yang dimuatkan ke dalam komponen 1 yang dilabelkan sebagai faktor kos dan modal. Penternak ikan sangkar berhadapan kenaikan kos penternakan/ pengeluaran dan ia menjadikan mereka berisiko untuk meneruskan pekerjaan sebagai penternak. Kos pembelian makanan ikan, benih ikan, peralatan penternakan seperti sangkar, tong ikan, jaring dan lain-lain meningkat dengan tinggi. Kenaikan harga makanan ikan merupakan kos input yang paling mengancam kumpulan penternak. Pada tahun 2022 sahaja berlaku tiga kali kenaikan harga makanan ikan dan ia amat membebankan penternak. Bekalan makanan ikan adalah daripada sumber import dan terdedah dengan kadar tukaran mata wang. Peningkatan harga input utama pembuatan makanan ikan iaitu jagung dan soya. Selain daripada itu, kekurangan modal telah menghalang penternak untuk mengembangkan aktiviti penternakan mereka. Modal yang besar diperlukan untuk membeli lebih banyak sangkar, lebih banyak makanan dan benih ikan dan lain-lain peralatan. Penternak juga berhadapan ancaman kenaikan kos untuk menyelenggara peralatan perikanan yang juga meningkat setiap tahun. Sebagai contoh, sangkar ikan yang perlu diselenggara apabila mengalami kerosakan akibat dilanggar oleh kayu yang dibawa arus sungai ketika banjir. Kerja membaik pulih peralatan ini dilakukan oleh penyelenggara upahan. Kos bahan-bahan baik pulih mengalami kenaikan harga. Selain daripada ancaman kos berkaitan dengan aktiviti perikanan, penternak juga berhadapan dengan kenaikan kos sara hidup. Ancaman kenaikan kos sara hidup banyak disumbangkan oleh kenaikan harga barangan keperluan asas.

Bagi komponen 2, terdapat tiga item (EK7 EK8 dan EK9) yang dilabelkan sebagai faktor hasil. Ancaman faktor hasil dapat dibincangkan berdasarkan tiga ancaman iaitu ancaman untuk menjual hasil tangkapan/ternakan; ancaman/ kesukaran untuk memasarkan hasil tangkapan dan persaingan kawasan penternakan. Menurut penternak, mereka berhadapan kesukaran untuk menjual dan memasarkan hasil ikan pada harga yang lebih tinggi daripada harga pasaran. Margin keuntungan kecil yang diterima memberi tekanan kepada mereka untuk meneruskan pengeluaran. Dalam pada itu, wujud persaingan lokasi yang sesuai dan strategik untuk melakukan aktiviti penternakan dalam beberapa tahun kebelakangan ini. Sebagai contoh, di Pekan, penduduk tempatan terpaksa bersaing dengan komuniti Kemboja untuk meletakkan sangkar mereka di tebing sungai.

Seterusnya untuk komponen 3 terdapat tiga item (EK1 EK2 dan EK10) yang dilabelkan sebagai faktor pendapatan dan pinjaman. Penternak ikan berhadapan risiko ketidaktentuan pendapatan menentu yang disumbangkan oleh faktor luar kawalan seperti kematian ikan, kejadian kemarau dan banjir yang menyebabkan hasil jualan ternakan ikan berkurangan. Responden turut menyatakan mereka pernah berhadapan dengan ancaman kehilangan pendapatan akibat ikan yang ditenak tidak dapat dijual langsung kerana mati yang berpunca daripada faktor pengurusan atau faktor persekitaran. Sementara itu, responden yang membuat pinjaman bagi menjalankan aktiviti penternakan, mereka berhadapan ancaman untuk membuat bayaran mengikut jadual yang ditetapkan. Ada dalam kalangan penternak gagal melunaskan hutang beberapa bulan sehingga terpaksa meminjam dengan saudara mara atau rakan-rakan bagi membayar ansuran pinjaman.

### **Faktor Kemudahterancaman Sosial – Fizikal**

Faktor kemudahterancaman sosial-fizikal pula mempunyai dua komponen. Nilai faktor muatan telah mencapai nilai yang ditetapkan ( $>0.50$ ) iaitu di antara 0.519 hingga 0.859. Terdapat tiga item (SF8, SF7 dan SF5) yang dimuatkan ke dalam komponen 1 yang dilabelkan sebagai faktor peribadi, kekeluargaan dan kemasyarakatan. Responden berhadapan ancaman berkaitan dengan kejiranan dan juga kemasyarakatan. Berlaku konflik dan salah faham sesama jiran dan masyarakat setempat. Keadaan ini juga mengganggu emosi dan kehidupan responden serta keluarga. Ancaman yang berpunca daripada faktor kekeluargaan turut menjejaskan emosi mereka. Konflik keluarga yang melibatkan hubungan suami isteri, anak-anak, adik beradik. Responden juga berhadapan isu berkaitan dengan keyakinan dan motivasi diri dalam melaksanakan pekerjaan. Dalam beberapa situasi penternak berasa kurang dan

hilang semangat dalam pekerjaan mereka terutamanya ketika berhadapan dengan kejadian luar jangkaan. Responden juga berhadapan dengan kerosakan atau kemusnahan peralatan ikan. Kerosakan dan kemusnahan peralatan ikan menjadi ancaman kepada penternak kerana ia boleh menjejaskan pekerjaan mereka. Mereka terpaksa mengeluarkan perbelanjaan untuk memperbaiki kerosakan peralatan.

Bagi komponen 2, terdapat tiga item (SF3, SF1 dan SF4) yang dilabelkan sebagai faktor keselamatan dan kesihatan. Kerosakan peralatan menternak ikan memberi ancaman kepada responden. Sangkar bocor akibat gigitan binatang liar memerang, dilanggar oleh kayu hanyut merupakan antara kerosakan yang sering dihadapi oleh responden. Responden Ancaman kecurian ikan atau pencerobohan kawasan operasi penternakan menjadi ancaman kepada penternak. Responden menyatakan kekerapan insiden kecurian berlaku terutama apabila ikan hampir ingin dituai dan dijual. Selain daripada kecurian ikan, penternak juga berhadapan kehilangan peralatan-peralatan penternakan seperti enjin, bot dan lain-lain. Manakala ancaman kesihatan memberi ancaman kepada menjejaskan responden sebagai penternak. Ciri pekerjaan sebagai penternak yang memerlukan tenaga dan kudrat, terdedah kepada cuaca panas dan hujan menyebabkan mereka berhadapan dengan masalah kesihatan. Responden mengusahakan sendiri tanpa mengupah pekerja. Apabila kesihatan terganggu, penternak terpaksa meninggalkan operasi mereka buat sementara dan ini menjejaskan kehidupan penternak berkenaan.

### Faktor Kemudahterancaman Sumber Asli dan Alam Sekitar

Faktor kemudahterancaman sumber asli dan alam sekitar mempunyai dua komponen. Nilai faktor muatan telah mencapai nilai yang ditetapkan ( $>0.50$ ) iaitu di antara 0.692 hingga 0.790. Terdapat tiga item (SA8, SA9 dan SA7) yang dimuatkan ke dalam komponen 1 yang dilabelkan sebagai faktor perosak. Aktiviti ternakan ikan sangkar terdedah kepada ancaman pelbagai perosak seperti serangan haiwan liar dan penyakit yang menyumbang kepada risiko kematian ikan. Binatang liar seperti memerang merupakan perosak yang menjadi musuh utama kepada penternak. Walaupun sangkar ditutupi dengan jaring tebal bagi melindungi memerang masuk, namun perosak ini masih boleh memasuki sangkar dengan menggigit jaring tersebut. Memerang akan memakan ikan-ikan dan banyak keadaan juga binatang perosak ini sekadar membunuh ikan tersebut. Sangkar-sangkar rosak, bocor dan menyebabkan kerugian kepada penternak. Populasi memerang semakin meningkat dan binatang ini menyerang sangkar penternak secara berkumpulan. Selain itu, ikan yang ditenak berhadapan risiko serangan penyakit yang menyebabkan ikan mati. Ikan yang terkena serangan penyakit cepat merebak, dan menyebabkan ikan mati. Kedudukan sangkar yang rapat serta bilangan ikan yang padat di dalam sesuatu sangkar penyakit mudah tersebar dan menjangkiti ikan yang sihat. Penyakit bawaan air yang dibawa oleh binatang kecil di dalam air menyebabkan badan ikan luka dan "cacat". Ini akan mengurangkan kualiti dan mengurangkan harga jualan.

Bagi komponen 2, terdapat tiga item (SA3, SA6 dan SA2) yang dilabelkan sebagai faktor bencana. Aktiviti ternakan ikan sangkar di Sungai Pahang setiap tahun berhadapan dengan ancaman berkaitan perubahan cuaca yang ekstrem. Bencana banjir dan kemarau menjadi ancaman alam sekitar yang dihadapi oleh responden. Musim tengkujuh yang diikuti banjir monsun dalam bulan November hingga Februari memberi ancaman kepada para penternak ikan di Sungai Pahang. Paras air Sungai Pahang meningkat mendadak dan banyak kawasan penempatan ditenggelami oleh air. Kerap berlaku sangkar ikan dihanyutkan oleh arus yang deras dan ikan terlepas keluar dari sangkar. Manakala kemarau pula menyebabkan paras air Sungai Pahang menjadi cetek dan suhu air sungai meningkat. Keadaan ini menyebabkan kematian ikan kerana kekurangan oksigen dan air menjadi panas. Sangkar menjadi "terangkat" disebabkan paras sungai yang cetek. Selain itu, ternakan ikan juga berisiko kepada insiden kayu hanyut yang dibawa arus deras melanggar sangkar dan lain-lain peralatan ternakan.

**JADUAL 7.** Analisis Faktor Penerokaan

Dimensi	Faktor	Kod	Item	Nilai Faktor Muatan		
				1	2	3
Ekonomi	Kos dan modal	EK4	Ancaman kenaikan kos penternakan/pengeluaran	0.858		

Dimensi	Faktor	Kod	Item	Nilai Faktor Muatan		
				1	2	3
		EK6	Ancaman kenaikan kos penyelenggaraan peralatan penternakan	0.765		
		EK5	Ancaman kekurangan modal bagi mengembangkan pekerjaan	0.735		
		EK3	Ancaman kenaikan harga barang keperluan asas/makanan.	0.597		
	Hasil	EK7	Ancaman menjual hasil tangkapan/ternakan		0.889	
		EK8	Ancaman/ kesukaran memasarkan hasil tangkapan.		0.876	
		EK9	Ancaman persaingan kawasan penternakan		0.502	
	Pendapatan dan pinjaman	EK1	Ancaman ketidaktentuan pendapatan			0.816
		EK2	Ancaman kehilangan pendapatan.			0.794
		EK10	Masalah untuk membayar balik pinjaman (kewangan/bukan kewangan)			0.502
Sosial/Fizikal	Peribadi, kekeluargaan dan kemasyarakatan	SF8	Masalah kejiwaan/masyarakat	0.859		
		SF7	Masalah keluarga yang menjejaskan emosi (R).	0.842		
		SF5	Masalah keyakinan dan motivasi diri dalam melaksanakan pekerjaan	0.707		
	Keselamatan dan kesihatan	SF3	Kerosakan/kemusnahan peralatan ikan		0.816	
		SF1	Ancaman kecurian ikan atau menceroboh kawasan		0.671	
		SF4	Ancaman kesihatan menjejaskan pekerjaan (utama/sampingan)		0.519	
Sumber Asli dan Alam Sekitar	Perosak	SA8	Ancaman kematian ternakan	0.790		
		SA9	Ancaman serangan haiwan liar (contoh: memerang)	0.735		
		SA7	Ancaman serangan penyakit ternakan	0.692		
	Bencana alam	SA3	Ancaman banjir/tengkujuh		0.732	
		SA6	Ancaman kayu hanyut		0.712	
		SA2	Ancaman kemarau		0.671	

## KESIMPULAN

Penternak ikan sangkar di Sungai Pahang berhadapan dengan multi-dimensi kemudahterancaman yang menjejaskan kelestarian aktiviti penternakan dan kehidupan mereka. Multi-dimensi kemudahterancaman dapat dibahagikan kepada tiga dimensi iaitu dimensi ekonomi, dimensi sosio-fizikal dan dimensi sumber asli dan alam sekitar. Analisis faktor penerokaan menunjukkan terdapat tujuh faktor kemudahterancaman yang dihadapi oleh penternak ikan yang boleh menjejaskan kelestarian aktiviti dan kehidupan mereka. Manakala sebanyak 22 indikator/ item yang memperincikan

bentuk ancaman yang dihadapi oleh para penternak di kawasan kajian. Ancaman daripada dimensi ekonomi disumbangkan oleh tiga faktor iaitu (i) kos dan modal; (ii) hasil dan (iii) pendapatan dan pinjaman. Manakala dimensi sosial/ fizikal menyumbang dua faktor ancaman iaitu (i) peribadi, kekeluargaan dan kemasyarakatan; dan (ii) keselamatan dan kesihatan. Faktor perosak dan bencana alam merupakan dua faktor kemudahterancaman yang dihadapi oleh para penternak ikan di Sungai Pahang. Hasil kajian ini memberi maklumat kepada pembuat keputusan seperti Jabatan Perikanan, Unit Perancang Negeri Pahang, Pejabat Daerah dan lain-lain agensi mengenai strategi serta program yang boleh dilakukan bagi mengurangkan ancaman-ancaman yang dihadapi oleh penternak ikan sangkar.

## PENGHARGAAN

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## **ALTERNATIF PENYELESAIAN TERHADAP ISU TEMPAT LETAK KENDERAAN DI PERUMAHAN STRATA KOS RENDAH**

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### **ABSTRAK**

*Tempat letak kereta (TLK) merupakan satu kemudahan ruang yang disediakan di dalam atau di luar sesebuah bangunan bagi meletakkan kenderaan kepada pengguna kereta. Namun, TLK di kawasan perumahan strata kos rendah di kawasan bandar sering menghadapi masalah TLK yang tidak mencukupi. Hal ini demikian, peningkatan kereta yang semakin meningkat mengikut peredaran masa menyebabkan penyediaan tempat letak kenderaan sedia ada tidak mencukupi. Kesannya, ramai pengguna kereta meletakkan kenderaan di bahu-bahu jalan serta amalan 'cop parking' semakin berleluasa. Oleh itu, kajian ini memberi fokus kepada dua objektif kajian iaitu mengenalpasti punca penyelesaian sedia ada tidak berkesan dan mengkaji alternatif penyelesaian bagi isu ketidakcukupan TLK khususnya di perumahan strata kos rendah. Reka bentuk kajian ini adalah kualitatif dengan menggunakan dua sumber data iaitu sekunder dan primer. Data sekunder diperolehi melalui ekstrak bacaan dari artikel, jurnal, dan kajian-kajian lepas. Manakala, data primer diperolehi melalui kaedah temu bual yang mendalam dengan pihak yang berkepentingan dan beberapa agensi yang terlibat. Kedua-dua data ini seterusnya dianalisis dengan menggunakan kaedah analisis kandungan dan naratif. Hasil kajian mendapati terdapat beberapa alternatif penyelesaian. Hasil penemuan mendapati, alternatif yang boleh digunakan bagi mengurangkan isu TLK ialah dengan penguatkuasaan undang-undang seperti pemakaian pelekat kenderaan bagi kemasukan ke dalam perumahan strata dan memantapkan pengurusan pengangkutan awam. Penemuan kajian ini diharapkan dapat membantu pihak berkuasa bagi menangani masalah ketidakcukupan TLK yang akhirnya menyumbang kepada isu-isu yang lain.*

*Kata Kunci: Tempat letak kereta, perumahan strata, penyelesaian*

### **ABSTRACT**

*A parking lot (TLK) is a space facility provided inside or outside a building to park vehicles for car users. However, TLK in low-cost strata housing areas in urban areas often face the problem of insufficient TLK. This is the case, the increase in the number of cars that is increasing with the passage of time causes the provision of existing parking spaces to be insufficient. As a result, many car users park their vehicles on the shoulders of the road and the practice of 'cop parking' is becoming more widespread. Therefore, this study focuses on two research objectives, which are to identify the cause of ineffective existing solutions and to examine alternative solutions for the issue of TLK inadequacy,*

*especially in low-cost strata housing. The design of this study is qualitative by using two sources of data, namely secondary and primary. Secondary data was obtained through reading extracts from articles, journals, and past studies. Meanwhile, primary data is obtained through in-depth interviews with stakeholders and several agencies involved. These two data were then analyzed using content and narrative analysis methods. The results of the study found that there are several alternative solutions. The findings found that an alternative that can be used to reduce the TLK issue is by law enforcement such as the use of vehicle stickers for entry into strata housing and strengthening the management of public transport. The findings of this study are expected to help the authorities to deal with the problem of TLK inadequacy which ultimately contributes to other issues.*

*Keyword: Parking lot, strata housing, solutions*

## **PENGENALAN**

Perumahan strata menjadi semakin popular dalam kalangan warga kota sejak tahun 2000. Pembangunannya bertambah rancak apabila perumahan strata ini menjadi inisiatif bagi menangani isu penempatan serta setinggan (Husna, 2022). Pembangunan strata jenis kos rendah atau lebih dikenali sebagai flat di Malaysia memiliki keluasan lebih kecil iaitu antara 46.5 hinggalah 60-meter persegi. Peningkatan pembangunan skim strata di Malaysia dapat dibuktikan melalui statistik laporan jumlah hakmilik strata yang dikeluarkan oleh Jabatan Ketua Pengarah Tanah Dan Galian Persekutuan (JKPTG) di mana terdapat sebanyak 1,444,858 hakmilik strata telah didaftarkan di seluruh Semenanjung Malaysia sehingga 31 Disember 2019. Contoh pembangunan skim strata ialah rumah pangsa, kondominium, rumah bandar, rumah kedai, pejabat, pejabat kecil pejabat rumah, kompleks perniagaan dan rumah-rumah dalam skim komuniti berpagar. Di samping itu, konsep pembangunan strata yang menawarkan imej kualiti kehidupan yang moden melalui penyediaan kemudahan seperti gimnasium, kolam renang, taman permainan kanak-kanak serta kawalan keselamatan turut menjadi faktor penarik kepada penawaran dan permintaan pembangunan skim strata.

Menurut Akta Hakmilik Strata 1985, terdapat tiga jenis harta dalam suatu bangunan strata iaitu bangunan atau tanah iaitu Petak strata, harta Bersama dan petak aksesori. Isu yang ingin diketengahkan dalam kajian ini adalah petak aksesori dimana ia dimiliki dan digunakan secara khas oleh seorang pemilik petak. TLK merupakan satu contoh petak aksesori yang mana pemilik petak akan memiliki dan menggunakan secara eksklusif. Seseorang yang membeli satu unit petak secara umumnya akan mendapat satu petak TLK. Namun isu terjadi apabila kebanyakan penghuni strata mempunyai lebih dari dua buah kenderaan dan menyebabkan petak aksesori yang digunakan lebih dari dua petak dan akan memberi masalah kepada penghuni yang lain. Selain daripada itu, rentetan daripada pembentangan bajet 2022, iaitu lanjutan pengecualian cukai jualan kereta ke atas semua jenis kenderaan penumpang (Bernama, 2022), dilihat jumlah pembelian kenderaan juga semakin meningkat. Lambakan kenderaan seterusnya menyebabkan masalah ketidakcukupan TLK khususnya di perumahan strata kos rendah.

Masalah ini dapat dilihat apabila segelintir penduduk terpaksa memarkir kenderaan di bahu-bahu jalan yang akan mengakibatkan kesesakan jalan raya di kawasan perumahan strata.





**RAJAH 1:** Parkir di Bahu Jalan



**RAJAH 2:** Cop Parkir

Tambahan lagi ada juga yang memakir kereta mereka di belakang atau di depan kenderaan pengguna lain atau kata nama lain parkir berganda (*double parking*). Parkir berganda ini akan menyebabkan pengguna kenderaan lain sukar untuk keluaran kereta mereka apabila diperlukan. Selain dari itu, ketidakcukupan TLK menggalakkan amalan ‘cop parking’ dimana penduduk akan meletakkan sesuatu barang atau benda di petak TLK seperti kerusi, pasu bunga, kon keselamatan yang akan menyebabkan penduduk lain tidak boleh meletakkan kenderaannya. Isu ini menjadi lebih parah apabila pergaduhan boleh berlaku di kalangan komuniti strata akibat tiada timbang rasa dalam meletakkan kenderaan. Oleh itu kajian ini dilakukan khususnya untuk mengkaji penyelesaian bagi menyelesaikan isu TLK terutamanya di kawasan perumahan strata kos rendah.

## KAJIAN LITERATUR

Tempat letak kenderaan didefinisikan sebagai ruang, lot atau petak kenderaan yang disediakan secara terancang sebagai tempat untuk meletak kenderaan (PLANMalaysia, 2016). Tempat letak kereta adalah satu kemudahan yang sangat mustahak dalam perancangan pengangkutan dan trafik. Penyediaan kemudahan tempat letak kereta yang baik dan sistematik adalah satu cara untuk mengawal aliran trafik di samping dapat memberi kemudahan tempat letak kereta yang mencukupi kepada pengguna kereta yang mengunjungi pusat bandar. Tempat letak kereta juga mempengaruhi kemajuan aktiviti-aktiviti guna tanah lain di pusat bandar. Penyediaan yang tidak mencukupi akan menyebabkan aktiviti-aktiviti bandar tidak dapat berkembang dengan baik. Penyediaan tempat letak kereta mesti sesuai dengan aktiviti gunatanah dan kawalan had ketinggian bangunan serta keluasan sesuatu kawasan pembangunan. Perancangan perlu menepati keperluan dan kepentingan semua pengguna mengikut jenis pembangunan melalui penyediaan reka bentuk dan susun atur yang seragam, selamat dan selesa secara terancang dan mencukupi bagi semua jenis tempat letak kenderaan (PLANMalaysia, 2016). Secara umumnya menurut Garis Panduan Penyediaan TLK, bagi jenis guna tanah perumahan pangsapuri kos rendah telah ditetapkan satu petak kereta untuk satu unit rumah dan tambahan satu petak motosikal bagi dua unit rumah.

### Penyelesaian Sedia ada yang Tidak Efektif

Pihak Berkuasa Tempatan (PBT) merupakan pihak yang bertanggungjawab untuk membantu dalam menangani isu-isu tempat letak kenderaan khususnya di perumahan strata kos rendah. Antara langkah-langkah yang telah diambil oleh PBT adalah dengan tindakan penguatkuasaan undang-undang. Menurut Akta Pengangkutan Jalan (1987), kenderaan yang menyebabkan halangan lalu lintas seperti parkir di bahu jalan atau parkir berganda (*double parking*) boleh dikenakan kompaun sebanyak RM150.00 dan bayaran ini akan meningkat mengikut hari. Selain daripada itu, PBT turut menunda kenderaan pesalah yang parkir di kawasan yang tidak sepatutnya supaya lalu-lintas terutama di kawasan komersial dan tumpuan orang ramai menjadi lancar.

Bagi kenderaan berat yang parkir di tepi kawasan perumahan, PBT telah bekerjasama dengan agensi penguatkuasa seperti Suruhanjaya Pengangkutan Awam Darat (SPAD), Polis Diraja Malaysia (PDRM) dan Jabatan Pengangkutan Jalan (JPJ) untuk menjalankan operasi secara berkala. PBT juga turut mengenalpasti kawasan yang berpotensi untuk dijadikan sebagai terminal bagi meletakkan kenderaan berat. Tambahan lagi bagi pengguna kenderaan yang ingkar tegar, tindakan menggantung atau membatalkan lesen kenderaan berat mengikut Seksyen 81 Akta Pengangkutan Awam Darat (APAD) 2010 boleh dikenakan (Rudy, 2017). Tambahan lagi, sejak tahun 2015 PBT telah bercadang dan menjalankan kajian terperinci untuk membangunkan TLK bertingkat khususnya di Projek Perumahan Rakyat (PPR) bagi menangani isu kekurangan TLK ini (Bernama, 2015; Mstar, 2017; Albab, 2016). Tambahan daripada itu, Jabatan Perancang Bandar dan Desa (2003) telah mengeluarkan satu garis panduan dan piawaian perancangan bagi tempat letak kereta bertingkat. Secara umumnya, PBT dilihat telah menjalankan tanggungjawab dengan amanah bagi mengurangkan masalah tempat letak kenderaan daripada semakin berleluasa.

Namun begitu isu TLK ini masih menjadi kerungsingan masyarakat awam sehingga kini. Terdapat beberapa punca kenapa isu TLK ini tidak dapat diselesaikan, antaranya ialah dari sikap manusia yang tidak prihatin dan tidak bertanggungjawab ketika meletakkan kenderaan. Bagi mereka yang memiliki kenderaan, sudah tentu sedia maklum mengenai amalan agar tidak menarik 'handbrake' dimana sekiranya terdapat kenderaan yang menghalang kenderaan yang ingin keluar, kenderaan yang menghalang itu akan ditolak ke kiri atau ke kanan untuk memberi laluan kepada kereta yang ingin keluar. Oleh itu, jika amalan ini dianggap remeh oleh penghuni strata, ia akan menjadi punca penyelesaian sedia ada tidak efektif. Selain dari itu, pihak kerajaan telah menyediakan pengangkutan awam bagi setiap perhentian. Akan tetapi, cabaran yang dihadapi adalah ketetapan masa yang kurang memuaskan. Oleh itu, masyarakat zaman sekarang lebih memilih untuk menggunakan kenderaan sendiri kerana lebih memudahkan perjalanan tanpa menentukan waktu yang telah ditetapkan bagi pengangkutan awam (Awang, 2020). Punca seterusnya ialah penduduk yang melanggar peraturan yang telah ditetapkan oleh badan pengurusan sebagai contoh sebuah keluarga yang mempunyai lebih dari satu kenderaan serta tidak mendaftarkan kenderaan tersebut kepada pihak pengurusan dan kemudian mereka meletakkan kenderaan dimerata tempat sehingga menimbulkan ketidakselesaian kepada penduduk yang lain seperti parkir berganda. Selain daripada itu, bagi penyediaan parkir bertingkat oleh Pihak Kerajaan, ianya memakan kos yang tinggi dan masa yang lama untuk disiapkan, maka banyak perancangan dilihat tidak berjaya untuk menyiapkan projek parkir bertingkat ini.

## METODOLOGI KAJIAN

Reka bentuk kualitatif telah digunakan dalam kajian ini, dimana ianya disokong dengan maklumat-maklumat yang munasabah dari hasil pengumpulan data yang dibuat secara terus kepada individu-individu yang berpengalaman dan berkhidmat dalam bidang pembangunan strata. Terdapat dua sumber data yang diperolehi iaitu data primer dan data sekunder. Data sekunder diperolehi melalui ekstrak bacaan dari artikel, jurnal, kajian-kajian lepas, laporan-laporan dan juga akhbar. Bagi data primer, kaedah temu bual mendalam bersama pakar dan pihak-pihak berkepentingan seperti yang ditunjukkan dalam Jadual 1 dibawah telah dijalankan dengan menggunakan soalan secara semi struktur.

**JADUAL 1:** Senarai Responden Kajian

<b>Kod Responden</b>	<b>Jabatan/Agensi</b>
Responden 1 <b>(R1)</b>	Jabatan Bangunan(MBIP)
Responden 2 <b>(R2)</b>	Jabatan Pesuruhjaya Bangunan(COB) (MBIP)
Responden 3 <b>(R3)</b>	Jabatan Pesuruhjaya Bangunan(COB) (MBIP)
Responden 4	Jabatan Bangunan(MBIP)

(R4)	
Responden 5 (R5)	Perbadanan Pengurusan ParkAvenue

Kedua-dua data ini seterusnya dianalisis dengan menggunakan kaedah analisis kandungan dan naratif.

## ANALISIS DAN PERBINCANGAN

Semua responden menyatakan sikap manusia yang tidak prihatin dan tidak bertanggungjawab ketika meletakkan kenderaan menjadi punca kepada isu TLK. Sikap tersebut sering diamalkan bagi sesetengah penduduk flat dan pangsapuri kos rendah yang mengamalkan cop parkir dan parkir berganda. Amalan ini dikatakan sudah berlarutan bertahun lamanya walaupun penguatkuasaan telah dilakukan. Tambahan pula responden bersetuju menyatakan bahawa kebanyakan pemilik perumahan strata kos rendah memiliki dua atau lebih kenderaan dan pastinya menyebabkan mereka akan parkir di bahu jalan atau kawasan-kawasan yang tidak dibenarkan. Seterusnya, menurut R2, R3, R4 dan R5 punca penyelesaian TLK sedia ada tidak efektif ialah pembangunan perumahan yang jauh dari kawasan pengangkutan awam. Menurut beliau, punca ini berlaku dikawasan perumahan strata berkost rendah yang jauh dari bandar. Kesukaran untuk mengakses pengangkutan awam akan menyebabkan penduduk lebih memilih untuk memiliki kenderaan sendiri untuk pergi ke destinasi yang dituju berbanding menaiki pengangkutan awam. Oleh itu penghuni akan mempunyai lebih dari sebuah kenderaan.

Antara alternatif yang boleh digunapakai bagi menyelesaikan isu TLK adalah dengan melaksanakan konsep ARP iaitu (Area Road Pricing) yang membawa erti Kawasan Bayaran Guna Jalan. Kesemua responden iaitu R1, R2, R3, R4 dan R5 merasakan boleh menggunakan konsep yang digunakan oleh negara Singapura itu. Menurut mereka konsep ini dapat mengurangkan kemasukan kenderaan persendirian ke pusat bandar atau perumahan kos rendah dan menggalakkan penggunaan meluas pengangkutan awam terutamanya oleh golongan pekerja. Tambahan lagi, dengan menggunakan sistem ini ia akan dapat mengurangkan masalah pencemaran seperti pencemaran udara, bunyi dan sebagainya. Oleh itu dengan adanya konsep ini dijalankan, ia kan menyumbang serba sedikit cara untuk mengurangkan penggunaan kenderaan persendirian dan seterusnya dapat mengurangkan masalah tempat letak kenderaan seperti kekurangan tempat kenderaan.

Selain daripada itu, majoriti responden menyatakan pihak kerajaan perlu mengkaji semula undang-undang pemilikan kenderaan bagi setiap keluarga. Menurut R1 sebagai contoh yang boleh diambil adalah jika kediaman kos rendah mempunyai dua bilik, mungkin disewa kepada dua penyewa dan setiap dari mereka memiliki sebuah dan lebih kereta. Tambahan lagi R2 menyatakan setiap anak juga memiliki kereta sendiri. Justeru itu sudah tentu peruntukan satu TLK untuk setiap kediaman di perumahan strata kos rendah tidak lagi mencukupi. Hal ini akan menyumbangkan kepada isu TLK seperti parkir berganda dan cop parkir. Oleh itu, kerajaan dan badan pengurusan strata perlu mengambil inisiatif tambahan untuk mengurangkan masalah ini daripada terus berlaku seperti memperkenalkan penggunaan pelekat kenderaan untuk membolehkan hanya kenderaan tertentu sahaja yang boleh masuk parkir di kawasan perumahan strata. Satu unit rumah akan mendapat satu pelekat secara percuma. Sekiranya memerlukan lebih daripada satu pelekat, bayaran akan dikenakan.

Kesemua responden juga menyatakan bahawa Pihak kerajaan perlu menyediakan pengangkutan awam dengan secukupnya mengikut masa yang sesuai. Masyarakat menganggap sistem pengangkutan awam terutamanya bas awam tidak menepati waktu operasinya. R2 menyatakan bahawa masalah seperti kelewatan bas dan perkhidmatan bas yang tidak mengikut jadual perjalanan yang ditetapkan menyebabkan masyarakat tidak bergantung sepenuhnya kepada perkhidmatan bas lagi kerana ia sukar untuk mereka merancang dan menjangka tempoh perjalanan mereka. Menurut kesemua responden, walaupun kemudahan kenderaan awam telah disediakan, kerajaan perlu meningkatkan lagi dan memantapkan lagi masa yang telah dijadualkan supaya rakyat dapat menggunakan kemudahan tersebut dengan sebaiknya.

Tambahan lagi, undang-undang kecil skim strata berkenaan dengan protokol TLK perlu dikemaskini oleh badan pengurusan atau persatuan penduduk di perumahan strata. Setelah Undang-Undang Kecil dikemaskini, salinannya perlu diberikan kepada semua penduduk dan pemilik petak. Ini

mbolehkan mereka membaca dan mematuhi peraturan sekitar TLK dalam harta tanah strata dan pemakluman berkenaan kawasan yang boleh dan tidak boleh untuk meletakkan kenderaan bagi penduduk mahupun pelawat diketahui dengan jelas. Pihak pengurusan juga perlu memutuskan untuk meletakkan pagar, papan tanda untuk menyekat kenderaan parkir di kawasan yang tidak dibenarkan. Papan tanda yang cukup dan jelas boleh memberi peringatan kepada penduduk, pemilik mahupun pelawat dan tidak terkejut sekiranya dikenakan sebarang notis dan denda atas kesalahan parkir.

## KESIMPULAN

Umumnya, populasi dunia terus meningkat, maka terdapat lebih banyak kenderaan di atas jalan raya. Namun tempat letak kenderaan semakin berkurang dan tidak berupaya untuk menampung bilangan kenderaan yang ada. Lebih banyak masalah timbul apabila pemilik petak berurusan dengan bangunan lama yang tidak dibina untuk menempatkan kereta, terutamanya apabila pemilik kini biasanya mempunyai dua atau lebih kereta seunit. Dalam bangunan strata kos rendah, isu paling biasa yang berkaitan dengan tempat letak kereta melibatkan tempat letak kereta di tempat penduduk lain, tempat letak kereta di harta bersama dan menyekat tempat letak kereta penduduk lain atau pintu masuk/keluar ke garaj bangunan, cop parkir mahupun parkir berganda yang boleh menyusahkan pemilik kenderaan lain. Masalah tempat letak kereta boleh menyebabkan ketidakharmonian dalam penghuni strata. Walau bagaimanapun, isu ini perlu ditangani dengan segera agar komuniti di perumahan strata kos rendah lebih harmoni. Terdapat empat alternatif yang boleh diguna pakai bagi mengurangkan masalah kekurangan tempat letak kenderaan iaitu pihak kerajaan perlu mengkaji semula undang-undang terhadap pengekangan pemilikan kenderaan bagi setiap keluarga, seterusnya pihak kerajaan perlu meningkatkan lagi sistem perkhidmatan pengangkutan awam dengan secukupnya, melaksanakan konsep ARP (Area road pricing) yang bererti kawasan bayaran guna tanah dan juga kemaskini Undang-Undang Kecil berkenaan protokol TLK di perumahan strata kos rendah.

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## **FACTORS AFFECTING BALANCED NUTRITION AMONG UNIVERSITY STUDENTS IN MUALLIM DISTRICT, PERAK**

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### **ABSTRACT**

*This study aims to examine several factors that may influence balanced nutrition, namely knowledge, emotional, family, peers, environmental and financial factors, among university students in Perak. Using a stratified random sampling method, a total of 150 students, consisting of Year 3 and 4 students from nine faculties in Universiti Pendidikan Sultan Idris, participate in this study via questionnaires survey. This study is also quantitative in nature, which employs descriptive statistics, specifically, frequency, percentage, mean score and correlation analysis. From the findings, it is found that family factor is the most important factor in balanced food intakes, with a high mean score level of  $M=3.57$ , as compared to other factors. The rest of the factors fall under the moderate mean score level, with mean scores between 2.97 and 3.31, respectively. Through Pearson's Correlation Test analysis, both knowledge and financial factors are positively and strongly correlated with emotional factors, while the rest of the other factors are moderately and positively correlated with each other, except for the environmental factor. Meanwhile, the environmental factor has played no role in balanced nutrition since the factor does not correlate at all with other factors concerning balanced food consumption. Hence, the findings of the study and the proven secondary data, which may infer high chance of obesity and prone to chronic diseases among Malaysians, imply the need for insurance protection in Malaysian society. Indirectly, these factors can also be considered in determining individual insurance premiums.*

*Keywords: Balanced nutrition; health; statistics; insurance*

### **ABSTRAK**

*Kajian ini bertujuan untuk mengenalpasti faktor-faktor yang boleh mempengaruhi pemakanan seimbang iaitu faktor pengetahuan, emosi, keluarga, rakan sebaya, persekitaran dan kewangan dalam kalangan pelajar universiti di Perak. Dengan menggunakan kaedah persampelan rawak berstrata, seramai 150 pelajar, yang terdiri daripada pelajar Tahun 3 dan 4 dari sembilan fakulti di Universiti Pendidikan Sultan Idris, mengambil bahagian dalam kajian ini melalui borang soal selidik. Kajian ini*

Persidangan Kebangsaan Ekonomi Malaysia ke 16 (PERKEM 16),

“Ketahanan dan Keterangkuman dalam Memacu Pemulihan Ekonomi di Era Ketidakpastian Geo-Politik”

Pulau Pinang, 5 Ogos 2023

*juga bersifat kuantitatif, dimana ia menggunakan statistik deskriptif, iaitu, kekerapan, peratusan, skor min dan analisis korelasi. Dapatan kajian mendapati bahawa faktor keluarga merupakan faktor terpenting dalam pengambilan makanan seimbang dengan tahap skor min yang tinggi dengan  $M=3.57$ , berbanding dengan faktor-faktor lain. Selebihnya, faktor pengetahuan, emosi, rakan sebaya, persekitaran dan kewangan berada di dalam tahap skor min sederhana, dengan skor min masing-masing antara 2.97 dan 3.31. Melalui analisis Ujian Korelasi Pearson pula, kedua-dua faktor pengetahuan dan kewangan adalah berkait rapat dengan faktor emosi, manakala faktor-faktor yang lain berkorelasi positif dan sederhana antara satu sama lain, kecuali faktor persekitaran. Sementara itu, faktor persekitaran tidak memainkan peranan dalam pemakanan seimbang kerana faktor tersebut tidak mempunyai hubungan langsung dengan semua faktor yang mempengaruhi pemakanan seimbang. Oleh itu, penemuan kajian ini dan data sekunder yang diperolehi, dimana mempunyai kemungkinan yang tinggi menjadi obes dan terdedah kepada penyakit kronik, membayangkan keperluan perlindungan insurans dalam kalangan masyarakat Malaysia. Secara tidak langsung, factor-faktor pemakanan seimbang ini juga boleh dipertimbangkan dalam menentukan premium insurans seseorang individu.*

*Kata Kunci: Pemakanan seimbang; kesihatan; statistics, insurans*

## INTRODUCTION

Regular exercise and balanced food consumption are vital in maintaining good health and preventing obesity and chronic diseases. According to National Health & Morbidity Survey (IPH, 2022), a study that is conducted among adolescents shows that one out of three people is overweight or obese; four in five people are physically inactive; two in three people are being sedentary; four in five people do not eat enough fruits & vegetables; one in three people drink carbonated drinks every day; one in ten people eats fast food at least three days in a week. Furthermore, 41 percent of Malaysians are projected to be obese by 2035, with body mass index (BMI) of more than 30 (Code Blue, 2023). By looking at the given facts, these two health aspects seem to be neglected by many young Malaysians.

Balanced food intakes should contain sufficient substances for the physical and mental development of individuals. Hence, consuming balanced and quality food is important in supplying the human body with nutrients and energy. A balanced diet should have all the ingredients the body needs in order to function normally. A balanced diet should contain optimal amounts of carbohydrates, proteins and fats as well as sufficient fiber content. Malaysian Diet Guide emphasizes the consumption of a variety of foods based on the Malaysian Food Pyramid. Different types of food supply different nutrients that the body needs. The food pyramid guide helps in choosing a balanced diet. Foods are placed at different levels in the food pyramid based on the value of the main nutrients (Ministry of Health Malaysia, 2011). Foods with the highest nutrient value are placed at the bottom of the food pyramid, while foods with the lowest nutrient value are placed at the top of the food pyramid.

According to Nur Hayati et.al (2008), students spend almost 30% of their total expenses on campus for food purposes. Eating a balanced diet and a regular eating schedule guarantee long-term health. Student needs mental and physical activity, sufficient nutrients are very important in effective learning activities (Abdullah & Ali, 2011). A balanced diet is important because it is a factor that can stimulate a person's growth to be healthy and perfect. As we all know, the construction of a strong body requires substances such as protein, carbohydrates and calcium. With a healthy body from a physical and mental point of view, a person can carry out his duties well and go through his days cheerfully. We will also become unhealthy if we do not take care of our daily nutrition (Shariff et al., 2008). If we practice healthy eating habits and follow the distribution of food in the food pyramid, we will get the physical and mental conditions that we should. Modern lifestyle practices are one of the factors that support this problem. In today's sophisticated and fast-paced millennial era, everyone is too busy with their own affairs and careers to neglect eating a balanced diet in their daily lives.

Therefore, this study is conducted to identify the important factors that can influence balanced food consumption among university students. Besides, this study intends to determine the relationship strengths between the variable factors concerning balanced dietary intakes.

## LITERATURE REVIEW

Unhealthy food habits has become a major concern among university students as a determinant of health status. A study that has been conducted at a University in Malaysia to assess eating habits and related social and psychological factors among medical students. The questionnaire method used found that the score for eating habits was low among younger students, i.e. 18-22 years old. The majority (73.5%) eat fruit less than three times a week, (51.5%) eat fried food twice a week or more and (59.8%) drink less than 2 liters of water per day. Most of the students in this study have healthy eating habits and it turns out that social factors and psychological factors are the determining factors of food habits among medical students. (Ganasegeran et al. 2012). According to a study conducted by Najat Yahia (2016), which aims to evaluate weight status, eating habits, physical activity, nutrition beliefs, and nutrition knowledge among a sample of students from Central Michigan University. A cross-sectional study conducted among a sample of undergraduate students found that 78% of female students were within a healthy weight range compared to 52% of male students. Most students have satisfactory eating habits because almost half of them drink two glasses of milk and two servings of fruits and vegetables. Physical activity and lifestyle scores show that most students are not physically active. Only 7% of students have a healthy lifestyle and 4% have good nutrition knowledge. Students' knowledge in balanced nutrition needs improvement. Therefore, a specific program developed to encourage healthy lifestyle behavior among students is highly recommended. Knowledge of food in behavior during the transition from adolescence to adulthood has implications for dietary interventions for children and adolescents. Diet data was collected through a questionnaire on health behavior, lifestyle, and personal health of adolescents aged 14 to 21 years. The results of this study found that the average frequency of eating fruit and vegetables decreased by 1-2 in 5 times a week between the ages of 14 and 21 years while the number of soft drinks increased almost 1 time a week between the ages of 15 and 16 years. Nevertheless, at the age of 14 there is still stability in food consumption behavior into young adults. (Nanna et al. 2001).

Knowledge of a balanced diet is also important to maintain health and also prevent disease. A study was conducted at Polytechnic Merlimau, Malacca to examine the extent to which polytechnic students are aware of balanced nutrition practices. The results show that the level of students' knowledge of balanced nutrition is still at a moderate level. In addition, through this study it can also be proven that the price of food and family is the main factor that affects students' food choices. There is a significant relationship between the level of students' knowledge and their nutritional practices although the relationship exists at a moderate and positive level. (Noorsyarzielah Saleh, 2013). Irregular eating habits are also an important health issue with implications for the economy. A study conducted at a Canadian University by advertising and paying \$5 for students willing to participate in a 20-minute survey consisted of graduate students who were 45% female and 55% male. Respondents are between 18 and 25 years old and have completed HBM as a research tool. The results of the study stated that the intention to consume healthy food for women is influenced by nutritional status and signals through the importance of a healthy diet. For men, the intention to eat healthy food is indirectly influenced by the status of the food, the signal of the importance of the diet and also its effect on the barriers and effectiveness of the food. Because eating behavior and reasons for eating vary according to gender, eating factors differ according to gender. (Deshpande et al. 2009).

The family plays an important role in ensuring that teenagers eat a balanced diet starting at home. If at home teenagers' families do not focus on balanced food, then this will affect teenagers, not to mention when teenagers go out of the house and sit far away from them. According to a study by Dianne et al. (2004), in general, teenagers report eating with the family often and the positive atmosphere with the family causes the food taken to be more nutritious. Next, adolescent eating patterns are established through a complex process that involves internal and external factors such as food preference and availability, weight perception, parental influence, and peers. Analysis based on the first interview of the National Adolescent Health Survey almost 1 in 5 teenagers stated that they did not eat breakfast and some also ate less vegetables (71%) and fruits (55%) and dairy foods (47%) than the total which is recommended. Adolescents with highly educated parents have better consumption patterns than those with low levels of parental education. Parental presence at dinner time was positively associated with higher consumption of fruits, vegetables and dairy foods. Nutrition and health

professionals should educate parents about the role of family mealtime for healthy adolescent nutrition (Videon & Manning, 2003).

In addition, the level of education of the parents is linked to the children, namely in terms of food intake, overweight and obesity. This study evaluated the relationship between the level of parental education and the frequency of obesity-related food consumption among children in Europe. A cross-sectional study was conducted and the results stated that the level of parental education affects food intake related to childhood obesity. Children in the low and medium level groups were less likely to eat low-sugar and low-fat foods and more likely to eat sugar and high-fat foods. These findings need to be taken into account in public health interventions so that many policies are made to improve children's diets (Fernández-Alvira et al., 2013). The next study is to explore if these modifiable factors can assess the difference in the level of fruit and vegetable (FV) intake between teenagers with educated and high-income parents compared to parents with no education and low income. by using longitudinal data. This study is part of the project "Fruits and Vegetables Make The Marks (FVMM) which is an intervention project that includes 38 random primary schools in Norway. The questionnaire method was given to the parents of the participants. As a result, teenagers whose parents have higher education are reported to eat fruits and vegetables more often compared to parents of teenagers without higher education.

In addition, families with higher incomes were reported to eat higher FV at home. This also did not show much relationship between parental education level or income and adolescent FV intake when adjusted for ease of access at home (Bere et. al 2008). Adolescents should be encouraged to help with food preparation and this would benefit from interventions and programs that teach skills to cook and make healthy purchasing decisions (Larson, Story, Eisenberg, & Neumark-Sztainer, 2006). Shu (2006) thinks that parents play an important role in influencing their children's eating habits, if from a young age they are educated with balanced and healthy eating practices, then it is not surprising that if the child grows up, then they will tend to follow healthy and balanced eating style, and vice versa. Kelly-Plate and Eubanks (2000) on the other hand stated that individual eating practices are usually influenced by the way of eating practiced.

## METHODOLOGY

This study employs a quantitative research methodology. Using a stratified random sampling method, a total of 150 students, consisting of final year students from nine faculties in Universiti Pendidikan Sultan Idris, participate in this study via questionnaires survey. The survey is created online where respondents are given the link through Google form and answer the questions in the survey. The questionnaires are inspired from Suhaimi (2016).

**TABLE 1.** Results of pilot study

Sample size	Number of item	Cronbach's Alpha Value
30	30	0.856

From Table 1, based on the rule of thumb on Cronbach Alpha reliability measure (Hair et al., 2003), a reliability value of less than 0.6 is considered poor, 0.6 to 0.7 as moderate, 0.7 to 0.8 is deemed as good, 0.8 to 0.9 is viewed very good and lastly, more than 0.9 is regarded as excellent. Therefore, the value of 0.856 in this pilot study demonstrates that the questionnaire is acceptable and very reliable, hence it is internally consistent.

**TABLE 2.** Mean Score Indicators

Mean Score	Interpretation
1.00 – 1.89	Very low
1.90 – 2.69	Low
2.70 – 3.49	Moderate



3.50 – 4.29	High
4.30 – 5.00	Very High

\*Source: Education Policy Planning and Research Division, MOE (BPPDP) in Zaki & Ahmad (2017)

Table 2 displays mean scores level, ranging from 1 to 5. A mean score of 1.00 until 1.89 means a very low mean score level, 1.90 until 2.69 shows a low level, 2.70 until 3.49 indicates a moderate level, 3.50 until 4.29 illustrates a high level and 4.30 until 5.00 demonstrates very high level, respectively.

**TABLE 3.** Coefficients of Pearson Correlation Analysis

Correlation Coefficients (r)	Interpretation
± 0.91 – 1.00	Very Strong
± 0.71 – 0.90	Strong
± 0.51 – 0.70	Moderate
± 0.31 – 0.50	Low
± 0.01 – 0.30	Very Low
0.00	No correlation

\*Source: Ismail, et. al. (2011)

Table 3 displays the coefficients of Pearson Correlation analysis that measures the strength of an association between paired data (Hashim et al., 2016). By looking at Table 3, correlation coefficients between 0 and ±1, can be positively or negatively correlated. A correlation coefficient (r) of 0 shows no correlation between variables, between ± 0.01 – 0.30 indicates a very low correlation, ± 0.31 – 0.50 indicates a low correlation, ± 0.51 – 0.70 indicates a moderate correlation, ± 0.71 – 0.90 indicates a strong correlation and ± 0.91 – 1.00 indicates a very strong correlation between variables, respectively.

## RESULTS AND DISCUSSIONS

Descriptive analysis is conducted on demographic aspects such as gender, age, weight, height, Body Mass Index (BMI) and faculties of the respondents. Table 4 shows the respondents' frequency distribution and percentages of the mentioned variables. From that table, a total of 122 (81.3%) respondents are female out of the total sample of 150 respondents, while male respondents consist of there are 28 students (18.7%). In addition, the majority of the respondents 84.7% of the students are in the range of 23 and 24 years old, 36.7 % and 48%, respectively. Accordingly, the rest of the respondents are below 23 and above 28 years old, with 8% and 7.3%, respectively. These students come from nine faculties, where the majorities of them are from FPE, FSK, and FPM, with 26.7%, 21.3%, and 18.7%, respectively. (see Table 4).

Table 4 also demonstrates the frequency distribution and percentage of respondents according to weight in eight categories. In the eight categories of weight, most respondents weigh between 41 kilograms and 60 kilograms with 68% of the sample. Meanwhile, 1.3% of the students are below 40 kilograms. On top of that, respondents, who weigh more than 60 kilograms are 20.7%. Moreover, the height of the respondents is divided into eight categories. Most respondents' height is between 151 and 160-centimeter category, with 56.7% of total respondents. Furthermore, when looking at the BMIs, 70.7% of the students in this study are normal, 18.7% are overweight and obese, and only 10.7% are underweight, respectively.

**TABLE 4.** Respondents' Profiles

Variables	Description	Respondents	Percentage (%)
Gender	Male	28	18.7
	Female	122	81.3
Age (Y)	21	2	1.3
	22	10	6.7
	23	55	36.7
	24	72	48
	25	8	5.3
	26	2	1.3
	28	1	0.7
Weight (Kg)	30 – 40	2	1.3
	41 – 50	58	38.7
	51 – 60	59	39.3
	61 – 70	14	9.3
	71 – 80	10	6.7
	81 – 90	2	1.3
	91 – 100	1	0.7
	>100	4	2.7
Height (cm)	145 – 150	21	14.0
	151 – 155	40	26.7
	156-160	45	30.0
	161-165	19	12.7
	166-170	16	10.7
	171-175	6	4.0
	176-180	1	0.7
	181-185	2	1.3
Body Mass Index (BMI)	Underweight	16	10.7
	Normal	106	70.7
	Overweight	18	12.0
	Obese	10	6.7
Faculties	FBK	16	10.7
	FSKIK	14	9.3
	FSMT	4	2.7
	FPE	40	26.7
	FSMP	5	3.3
	FSK	32	21.3
	FPM	28	18.7
	FPTV	5	3.3
	FSSKJ	6	4.0

**TABLE 5.** Average Mean score for the factors that may influence a balanced nutrition

Factors	Average Mean Score
Knowledge	3.18
Emotions	3.09
Family	3.57
Peers	2.97
Environment	3.31
Financial	3.17

Table 5 shows a descriptive analysis of mean scores for factors that may influence balanced nutrition among UPSI students. Based on the above table, the highest average mean is recorded by the family factor which is  $M = 3.57$ , which is regarded as a high mean score level. In contrast, the peer factor is stated as the lowest mean score with a value of 2.97, which fall under the moderate level. The rest of the factors, namely, knowledge factors, emotional factors, environmental factors, and financial factors, the average mean scores for these four factors are at moderate levels as well, with average mean scores of 3.18, 3.09, 3.31, and 3.17, respectively.

**TABLE 6.** Correlation between knowledge, emotioal, family, peers, environmental and financial factors in balanced nutrition

Variables		Knowledge	Emotional	Family	Peers	Environment	Financial
Knowledge	Pearson Correlation	1	0.716***	0.606***	0.638***	0.188**	0.605***
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.021	0.000
	N	150	150	150	150	150	150
Emotional	Pearson Correlation	0.716***	1	0.646***	0.666***	0.184**	0.708***
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.024	0.000
	N	150	150	150	150	150	150
Family	Pearson Correlation	0.606***	0.646***	1	0.583***	0.176**	0.566***
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.031	0.000
	N	150	150	150	150	150	150
Peers	Pearson Correlation	0.638***	0.666***	0.583***	1	0.229***	0.586***
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.005	0.000
	N	150	150	150	150	150	150
Environment	Pearson Correlation	0.188**	0.184**	0.176**	0.229***	1	0.207**
	Sig. (2-tailed)	0.021	0.024	0.031	0.005	0.000	0.011
	N	150	150	150	150	150	150
Financial	Pearson Correlation	0.605***	0.708***	0.566***	0.586***	0.207***	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000
	N	150	150	150	150	150	150

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 N
 

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\*\*\*0.01 level of significance

\*\*0.05 level of significance

Through Pearson's Correlation Test analysis from Table 6, both knowledge and financial factors are positively and strongly correlated with emotional factors, with  $r = 0.716$  and  $r = 0.708$ , respectively. In addition, the rest of the other factors are moderately and positively correlated with each other, except for the environmental factor. Meanwhile, the environmental factor has played no role in balanced nutrition since the factor does not correlate at all with other factors concerning balanced food consumption. Thus, there is a negligible correlation between environment and any other factors above, be it knowledge, emotional, family, peers or financial factors.

## CONCLUSION

In a nutshell, students or young generations may expose themselves to danger due to imbalanced nutrition, which may threaten their health and affect their thinking. The study finds that family factor is the most important factor in balanced food intakes, as compared to other factors. The rest of the factors fall under the moderate mean score level, respectively. Through Pearson's Correlation Test analysis, both knowledge and financial factors are positively and strongly correlated with emotional factors, while the rest of the other factors are moderately and positively correlated with each other, except for the environmental factor. Meanwhile, the environmental factor has played no role in balanced nutrition since the factor does not correlate at all with other factors concerning balanced food consumption.

Hence, the findings of the study and the proven secondary data, which may infer high chance of obesity and prone to chronic diseases among Malaysians, imply the need for insurance protection in Malaysian society. Indirectly, these factors can also be considered in determining individual insurance premiums. A high chance of obesity and prone to chronic diseases implies the need for insurance protection in Malaysian society. All the proven data and findings of this study should be considered in determining insurance premiums.

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# EMPOWERING BUMIPUTRA SMES THROUGH INTELLECTUAL CAPITAL: LESSONS FROM A DEVELOPING NATION

(MEMPERKASA PKS BUMIPUTERA MELALUI MODAL INTELEK: PENGAJARAN DARIPADA SEBUAH NEGARA SEDANG MEMBANGUN)

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## ABSTRACT

*Small and medium-sized businesses (SMEs) are crucial to the growth of national economies since they support the export sector's expanding GDP contribution, a large number of jobs, and social infrastructure. A productive environment for the continued study of intellectual capital is provided by SMEs, which are also seen as essential for the growth of entrepreneurial skills and creativity. Unfortunately, there hasn't been much attention paid to intellectual capital research in Malaysia. By looking at intellectual capital within SMEs in a developing nation setting, this study seeks to fill a gap in the existing literature. The purpose of this study is to determine how intellectual capital components influence the Bumiputra SME business performance. The qualitative method will be applied in data gathering using NVivo-facilitated interview sessions. The findings assisted SME firm owners in understanding how intellectual capital affects company performance and helped them make the best choice. Two business owners were regarded as the primary informants for the interview session. The results of this study showed that the components of intellectual capital (human capital, structural capital, customer capital, social capital, technological capital, and spiritual capital) have an impact on how well-off Bumiputra SME entrepreneurs perform commercially. Overall, this study's findings had a considerable positive impact on Bumiputra SME business performance from both a theoretical and an empirical standpoint.*

*Keywords: SME; Bumiputra; intellectual capital; performance*

## ABSTRAK

*Perniagaan kecil dan sederhana (PKS) adalah penting kepada pertumbuhan ekonomi negara kerana mereka menyokong sumbangan KDNK sektor eksport yang berkembang, sejumlah besar pekerjaan dan infrastruktur sosial. Persekitaran yang produktif untuk kajian berterusan modal intelek disediakan oleh PKS, yang juga dilihat sebagai penting untuk pertumbuhan kemahiran dan kreativiti keusahawanan. Malangnya, tidak banyak perhatian diberikan kepada penyelidikan modal intelek di Malaysia. Dengan melihat modal intelek dalam PKS dalam suasana negara membangun, kajian ini cuba mengisi jurang dalam literatur sedia ada. Tujuan kajian ini adalah untuk menentukan bagaimana komponen modal intelek mempengaruhi prestasi perniagaan PKS Bumiputera. Kaedah kualitatif akan digunakan dalam pengumpulan data menggunakan sesi temu bual yang difasilitasi oleh NVivo. Penemuan ini membantu pemilik firma PKS memahami cara modal intelek mempengaruhi prestasi syarikat dan membantu*

*mereka membuat pilihan terbaik. Dua pemilik perniagaan dianggap sebagai pemberi maklumat utama untuk sesi temu duga. Hasil kajian ini menunjukkan bahawa komponen modal intelek (modal insan, modal struktur, modal pelanggan, modal sosial, modal teknologi, dan modal kerohanian) memberi kesan terhadap prestasi usahawan PKS Bumiputera yang berada dalam keadaan baik secara komersial. Secara keseluruhan, dapatan kajian ini mempunyai kesan positif yang besar terhadap prestasi perniagaan PKS Bumiputera dari sudut teori dan empirikal.*

*Kata kunci: SME; Bumiputera; Modal intelek; Prestasi*

## INTRODUCTION

A growing body of research has begun to explore the concept of intellectual capital in small and medium-sized enterprises (SMEs) operating in developing and under-developed economies as a result of the widespread recognition of intellectual capital's beneficial role in the developed world (Khalique et al., 2015). Many academic studies agree that proactive management of intellectual capital is essential for an organization's success (Ahamad et al., 2022; Bansal & Singh, 2020; Weqar et al., 2020). Furthermore, intellectual capital is just as crucial for small and medium-sized businesses (SMEs) (Aljuboori et al., 2022; Ullah et al., 2021; Faisal et al., 2021). In addition, SMEs are thought to be crucial for the development of entrepreneurial skills and the advancement of innovation and as such offer a fruitful setting for the further study of intellectual capital. However, a study that disputes this assertion, contends that intellectual capital has a detrimental impact on financial success (Ziyad, 2023). Consequently, this study aims to reduce the gap by engaging with SME owners and illuminating the critical impact of intellectual capital components on the overall performance of SME businesses.

The Southeast Asian nation of Malaysia is renowned for its beaches, rain forests, and a blend of Malay, Chinese, Indian, and European influences. With a population of thirty million and a GDP per capita of \$25,833 USD, according to the International Monetary Fund ([www.imf.org](http://www.imf.org)), Malaysia's economy enjoys burgeoning growth and higher development aspirations. Unfortunately, there hasn't been much attention paid to intellectual capital research in Malaysian percent of the total workforce. With about 68 percent of the population, Bumiputera really hold the majority (11MP, 2016). In Malaysia, a Bumiputera is referred to as a son of the land (Awang et al., 2009). Sadly, Bumiputera SMEs are consistently unable to gain a greater market share and can only contribute less than 20 percent of the Malaysian economy. According to the ETP Annual Report (2014), the GDP of Bumiputera SMEs in 2015 was only about 16 percent. As a result, Bumiputera SMEs must expand in order to meet non-Bumiputera SMEs' contribution to the GDP in at least a 50:50 ratio.

In order to overcome these problems, Bumiputera SMEs must build a lasting solution that can create strategic assets. By putting plans that take advantage of their internal resources or intangible resources into practice, companies can gain sustainable competitive advantages. This is consistent with Marcin's (2013) proposal that the growth of future nations depends largely on their intangible assets. These resources also strengthen the firm's intellectual capital, which Zin et al. (2022) defined as its superior performance and competitive advantage. According to Zin and Manaf (2019), using intellectual capital is a strategic way to pursue and achieve women SME entrepreneurs' business performance. A company's value can be explained by factors such as intellectual capital, profitability, and excellent corporate governance (Ekaputra & Fuadah, 2020). Accordingly, effective utilization of firms' intellectual capital improves business performance (Sardo & Serrasqueiro, 2017). Because the concept of intellectual capital in Bumiputera SMEs has not received considerable attention, the research context for this study is distinct. So much remains to be discovered about how intellectual capital grows and affects Bumiputera SME business success. These questions are of utmost importance as they provide us with a comprehensive understanding of intellectual capital, both in theory and practice. Hence, the primary objective of this study is to bridge a significant research gap by investigating the concept of intellectual capital in small and medium-sized enterprises (SMEs) within the context of developing countries.



## LITERATURE REVIEW

Since organizational success is the foundation for business performance, the perception of Bumiputera SMEs will essentially be gauged subjectively. Entrepreneurs are specifically questioned about how satisfied they are with the results of sales, profits, business growth, a rise in employee numbers, customer satisfaction, and the net asset value of the company. A lot of earlier investigations (Gaskill et al., 2015; Yusof et al., 2014) used this measurement. Since SMEs are typically reluctant to publicly reveal their financial statements, subjective measures (using a seven-point Likert scale) are employed to assess the business success of Bumiputera SMEs (Zin et al., 2022).

The resource-based perspective highlights the type of coordination that occurs within the company, its organizational design and efficiency, as well as the function of management and the distribution of decision-making authority. Resource-Based Theory explains that the internal resources owned by the company (both tangible and intangible) affect the company's performance which will ultimately increase the value of the company (Nani & Safitri, 2021). In addition, one form of intangible resources owned is intellectual capital. A firm's ability to innovate depends on its knowledge and intellectual resources, according to recent theoretical advancements in the knowledge-based view or the IC-based view of the firm (Reed et al., 2006; Martn-de Castro, 2015; Subramaniam and Youndt, 2005; Ngah and Ibrahim, 2009; Secundo et al., 2017). This is an observable claim. A particular theoretical framework, which is often a broad multidisciplinary one, is represented by the so-called knowledge-based view of the firm. One of the key terms used in the article is "intangible capital," or "IC," which refers to intangible assets that add value to a business by giving it a competitive edge (Ashton, 2005; Edvinsson & Malone, 1997; Brown et al., 2005; Dabic, 2018).

Galbraith coined the phrase "intellectual capital" in 1969 and defined it as an intellectual contribution that is held by an individual. Investments in suppliers, consumers, personnel, and technological innovation were all regarded by Kaplan and Norton (1996) as IC. Stewart (1997) provided one of the key definitions of IC, stating that it encompasses knowledge, information, intellectual property, and experience that may be used to provide value for a company. There is no question that IC is an extension of the conventional concept of capital and includes intangible assets that can create value, even though there hasn't been a clear-cut definition of IC (Hsu and Fang, 2009; Jian Xu 2018). Both academics and practitioners are conducting in-depth study on the connection between IC and company performance as evaluated by profitability, productivity, earnings, and market performance. Most studies have shown that IC has a substantial role in improving an organization's performance. For instance, early studies utilizing US data and referencing Aljuboori and Buren (1999) revealed a favorable correlation between IC investment and financial performance. However, contrasting research findings exist on this topic. Firer and Williams (2003) discovered minimal or no correlation, while other studies such as Britto et al. (2014) and Morariu (2014) reported unexpected results.

Human capital is considered one of the core dimensions of IC and the most important firm's asset since it is the source of firm's strategy renewal, creativity, and innovation capacity, and consequently sustains a major competitive advantage (Chi et al., 2016; O'Sullivan & Schulte, 2007; Bontis et al., 2007; Bontis, 1998; Brooking, 1997; Edvinsson and Malone, 1997; Nonaka & Takeuchi, 1995). Human capital gives businesses a distinctiveness (O'Sullivan & Schulte, 2007) in the development of added value of goods to win over key stakeholders' loyalty (Bontis et al., 2007; Ghosh & Mondal, 2009; Cater & Cater, 2009; Sydler et al., 2014; Tsakalerou, 2015; Ilyin, 2014).

According to Joshi et al. (2013), customer capital is the knowledge that is incorporated into the identification, development, and management of external relationships. Additionally, this capital enables businesses to access information and assets that are part of the connection network and are derived from it (Meles et al., 2016). According to Tsakalerou (2015); Meles et al. (2016), Joshi et al. (2013); and Sydler et al. (2014), customer capital refers to a company's capacity to generate value through intricate interactions with external stakeholders. Since it partially lies outside of a company's core competencies, customer capital is the most challenging IC dimension to develop (Scafarto et al., 2016). It improves interactions between human and structural capital and stakeholders and affects how those stakeholders view the company (Meles et al., 2016; Bontis et al., 2015; Sardo, 2018).

According to Bontis et al. (2015), structural capital stays in the company even after people have departed. Referring to Denicolai et al. (2015), structural capital includes organizational capacities, culture, processes, patents, copyrights, trademarks, databases, and other things. The results of the recent

research indicate that other particular facets of the sustainability of SMEs must consider the application of technology to enhance company performance (Jovanovic et al., 2020; Zhong et al., 2020). According to Ghasemaghahi and Calic (2019), businesses that implemented technology earlier experienced faster productivity benefits than businesses of a similar size that did not. Compared to businesses without connections or businesses with access exclusively through dial-up services, businesses with faster Internet connection speeds via broadband boost business efficiency (Kim & Orazem, 2017). This circumstance will make it simpler for SMEs to enhance their performance, such as in the functions of their resources in manufacturing, marketing, and sales.

In a method that has a positive larger influence on corporate performance, spiritual capital is a significant driver of SME business performance. The performance of SME businesses and spiritual capital were shown to be strongly correlated. Additionally, the effective use of technology capabilities is associated with improved company performance and can provide firms with a competitive edge. IT and innovation have a favourable effect on organizational performance, according to a study on fables enterprises in Taiwan. The following claims are made in light of the literature review:

H1: Human capital has an influence on Bumiputra SME business performance.

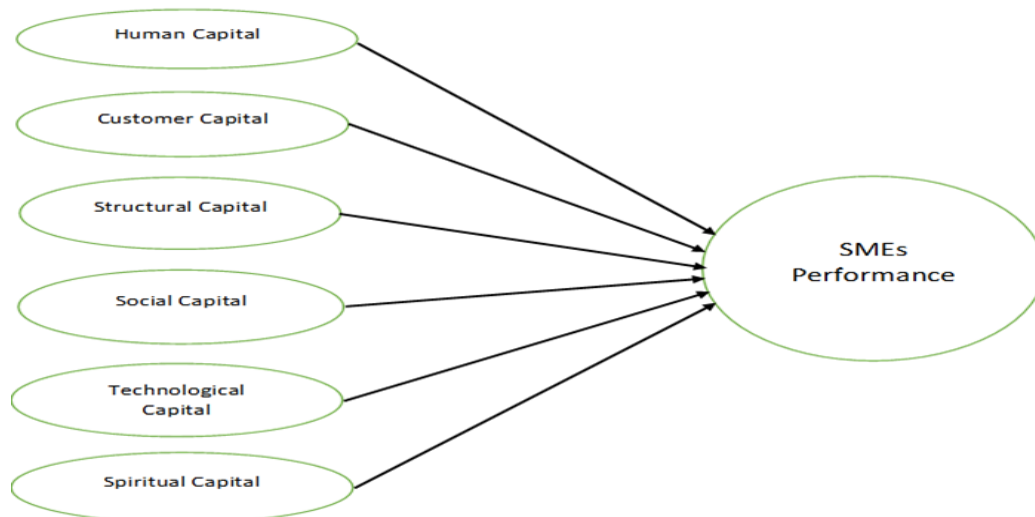
H2: Customer capital has an influence on Bumiputra SME business performance.

H3: Structural capital has an influence on Bumiputra SME business performance.

H4: Social capital has an influence on Bumiputra SME business performance.

H5: Technological capital has an influence on Bumiputra SME business performance.

H6: Spiritual capital has an influence on Bumiputra SME business performance.



**FIGURE 1:** Research Framework

## METHODOLOGY

This study employed a qualitative research methodology to examine and characterize the intellectual capital of SMEs in Malaysia, with a focus on evaluating their performance. To obtain thoughts, attitudes, and suggestions, interviews were performed, which are frequently utilized by market researchers (Templeton, 1987). The study used a qualitative approach, and participants were carefully chosen in order to better understand how intellectual capital affects Bumiputera SME company performance. Ten business owners that would react differently to the dependent variable were selected for this study from various districts in Selangor and Kuala Lumpur. This strategy is consistent with Creswell's (1998) recommendation for 5 to 25 respondents, while Morse's (1994) recommendation is for at least six. Prior to the interview, possible participants were contacted. Only three of the 10 businesspeople contacted for the interview consented to take part. We enquired as to the interviewees' preferred day, time, and location.

The "Grounded theory" approach, a popular thematic analysis technique in qualitative investigations, was applied in this study's data analysis. Through a semi-structured, open-ended interview, this study seeks to gather useful data and records the conversation. A series of open-ended questions that had been predetermined and additional questions that came up during the interview with the subjects were used to conduct it. Face-to-face interviews let the researcher and participant socialize, which is particularly useful when giving a preliminary explanation. When an interviewee's explanation is required or their statements need to be expanded upon, the researcher has the chance to elicit more information. The one-on-one interview lasted for one to two hours, was recorded on audiotapes, and notes were taken simultaneously. The interview was verbatim transcribed in order to give the most precise and thorough data analysis. NVivo was used for the analysis of the interview data. In order to guarantee the validity and reliability of the interview data, the study then utilized the following interview techniques:

1. The study's participants are made aware of the study's objectives, which include the focus on Bumiputera SME entrepreneurs and the strict confidentiality of all findings.
2. In the final study report, the quotes from the interview are utilized anonymously and no specific respondent is named.
3. There is no interviewer bias because the participants are familiar with the interviewer through informal interactions, and the interviewer obtains the trust of the interviewees before the study ever starts.
4. The researcher carefully prepares in order to win the interviewees' trust:-
  - a. Be knowledgeable about the research issue and the firm doing the study.
  - b. Before the event, give participants a list of the interview themes.
  - c. Offer the participants a convenient time for the interview so they feel at ease and at liberty to speak.

## RESULTS AND DISCUSSION

Before taking part in this study, all subjects had to give their full consent, which made sure they gave clear, understandable answers and got rid of any doubt. Demographic information, such as age, company background, job, gender, level of education, business location, and number of workers, was only collected for the study and kept strictly anonymous and private. Focusing on clear and thorough communication, the study's main goal was to make sure that all subjects understood and knew what to do. Table 1 was included to give a general idea of what the subjects were like by describing them and making the study process clearer.

**TABLE 1:** Participants' Descriptions

	Participant 1	Participant 2
Company	Construction	Food and Beverage
Position	Owner	Owner
Gender	Male	Male
Age	50 – 60 years old	30 – 40 years old
Education	SPM	SPM
Business Location	Rural	Urban
Number of Workers	25	18

The findings comprise a few sections: a) human capital; b) customer capital; c) structural capital; d) social capital; e) technological capital; and f) spiritual capital. Table 2 summarises the responses made by the participants.

### Human Capital

Human capital was given a lot of attention in this study because it is such an important part of small and medium-sized businesses (SMEs). In this study, interviews were used to show how important people are as the pushing force behind the production process in SMEs. People know that these businesses depend on people a lot, especially when it comes to providing services to customers. The owners of small and medium-sized businesses (SMEs) are sure that human capital is a key tool that their businesses can't do well without. In fact, the success and smooth running of a small or medium-sized business (SME) depends a lot on having workers who are skilled, educated, and have a deep understanding of how the business works. This abundance of human talent and knowledge makes it easier for leaders and managers to steer the business toward its goals. So, for SMEs to grow and succeed in the long run, they need to recognize and use the power of their people capital.

*“We require employees who are skilled and knowledgeable to run our business. (Participant 1)”*

*“Graduate employees are more concerned about the salary and not about gaining knowledge. Due to this scenario, staff turnover is very high in the food and beverage industry. (Participant 2)”*

### Customer Capital

Along with human capital, this study also shows how important customer capital is to the growth and success of businesses. Customer capital comes from building long-term links and relationships with outside parties. When a business can build and keep ties with its customers, this capital becomes a valuable tool that makes a big difference in how well the business does overall. Having a lot of customer cash is good for the business in a number of ways. It makes organizational tasks like planning, fixing problems, making things, and giving out services more effective. Businesses can save money on customer recruiting and renewal costs by building strong ties with their customers. Also, customer capital is a key part of improving quality, reliability, and flexibility, all of which are important for meeting customer wants and standards. In turn, this gives buyers value by giving them access to new goods or services. So, customer capital not only helps the business build a loyal customer base, but it also gives customers more value by making sure they have a good time during the whole process of making products or providing services. Businesses that want to have long-term success and steady growth need to understand how important customer capital is and know how to manage these relationships well.

*“We take serious action on customer complaints and have a specific officer in charge of handling this issue. Our motto is ‘Your satisfaction is our goal’” (Participant 1)”*

*“Customer’s feedback on our services will be monitored through social media created such as FB, IG, TikTok” (Participant 2)”*

### Structural Capital

Aside from human and customer capital, structural capital is an important component of intellectual capital inside a corporation. This includes all non-human knowledge and assets that contribute to the overall functioning of the organization. The organizational structure of the corporation, software, and hardware systems, databases, patents, trademarks, and other intellectual property assets are all examples of structural capital. These resources and competencies are critical in increasing worker productivity and supporting the organization's efficient operation. The establishment of a strong system and firm structure that assists people in maximizing their intellectual potential and overall corporate success is an important part of structural capital. This entails building a climate inside the organization that encourages information exchange, cooperation, and constant learning. Companies may expedite workflows, improve communication channels, and stimulate innovation by using efficient systems, procedures, and technologies. These structural capital inputs are required for the development of a supporting infrastructure that allows workers to successfully exploit their talents, knowledge, and intellectual assets.

*“We have a system that captures all our customer database but we hire an external consultant to handle*

*all our income taxes related to the Inland revenue board.” (Participant 1)*

*“There are 7 outlets and we do business at the food court, kiosks, in the canopy, and provide catering to small events. We have a system and database to monitor all the outlets.” (Participant 2)*

### Social Capital

Small and medium-sized enterprises (SMEs) may profit substantially from creating and exploiting social capital in their communities. When SMEs are linked to strong networks and communities that harness the power of social capital in their commercial operations, it may result in considerable growth and beneficial results for the firms involved. Social capital explains how individuals of a community behave and interact with one another in the context of trade. Management must develop a friendly and supportive climate that encourages community members to contribute their social capital to the organization in order to efficiently use social capital. SMEs may tap into the pooled knowledge, resources, and networks of the community by cultivating a feeling of belonging and building strong connections with stakeholders. Social capital serves as a source of inspiration, pushing disparate parties to collaborate for mutual achievement. When people in the community feel empowered and inspired, they are more likely to give their talents, knowledge, and support to the organization, propelling its development and success. Furthermore, social capital may help a community reach its full potential by facilitating cooperation, collaboration, and mutual trust among its members. SMEs may benefit from expanded access to information, collaborations, and market possibilities by utilizing social connections, shared values, and conventions. Social capital not only helps individual business success, but it also improves SME performance within the community.

*“We organize religious ceremonies and maintain a good relationship with our employees and retain an ongoing relationship with our customers. (Participant 1)*

*“Every year, organize annual dinner for the employees to make them feel appreciated.” (Participant 2)*

### Technological Capital

Technological capital includes physical and intangible technology that boosts a company's capabilities. Technological capital includes robots, computers, internet apps, and ICT infrastructure. These tools and methods help organizations simplify, improve, and use digital platforms. Technological capital also includes intangible technical skills like problem-solving, data analytics, information communication, safety standards, and content production, which help people and organizations use and traverse digital resources. Digital capital capabilities and technologies show companies recognize technology's disruptive and value-enhancing potential. Businesses may enhance operations, customer experiences, and market potential using digital technologies. Technology helps SMEs compete in the digital revolution and reap its rewards. However, not all SMEs need considerable technology integration in their company processes. Participant 1 may be less tech-savvy than Participant 2. SME variety and context-specificity are shown through tech knowledge and adoption differences. Some SMEs may succeed without technology or in areas where technology is less important.

*“We don't have high tech system. Our company only focus on the supply and installation of machinery. But we have heavy machinery for our operation purpose.” (Participant 1)*

*“For the F&B industry, we consider our company as technology savvy. Our sales are collected through online payment such as e-wallets, transfers, etc. Product advertisement is also done through social media such as FB, IG, and TikTok.” (Participant 2)*

### Spiritual Capital

Spiritual capital boosts corporate success with human, consumer, social, and technological capital. Numerous interviews show that spiritual capital helps SME owners cope with obstacles and risks. It includes morality, faith, honesty, ethics, motivation, devotion, self-esteem, enthusiasm, and sincerity. Organizational and individual spiritual capital is crucial. Spiritual capital ensures company practices

meet legal and industry norms. It promotes financial transparency and ethics. Spiritual capital improves organizational performance. SME owners interviewed for this survey acknowledged spiritual practices that nurture their spiritual capital. Dhuha, group prayers before work, study, pilgrimage, and voluntary sunnah fasting are examples. SME entrepreneurs get advice, strength, and inspiration from spiritual practices. Spiritual capital helps people overcome obstacles, stay cheerful, and devote themselves to their enterprises and staff. Spiritual capital in SMEs acknowledges that company success is holistic, including intangible and profoundly personal variables. SMEs promote values-driven decision-making, ethical behaviour, and stakeholder well-being through valuing spiritual capital. This holistic corporate management strategy boosts performance and development.

*“We are very concerned about the honesty and trust of our workers. We also encourage our workers to attend religious events organized by us during the weekend. Furthermore, we send our workers to perform Umrah once in a lifetime.” (Participant 1)*

*“Require female employees to wear hijabs and maintain cleanliness, especially when preparing food. Supervisors of each outlet will remind staff to perform their daily prayers and fasting during Ramadhan. We are concerned about the quality of services and receptiveness towards customers by our employees.” (Participant 2)*

**TABLE 2:** Summary of Findings

Theme	Participant 1	Participant 2
Human capital	<p>Employees with knowledge and skills can advance the business.</p> <p>Possess the certification required for employment.</p> <p>Sending staff members to training sessions based on the industry they work in to improve the business.</p>	<p>Post-graduate workers are concerned about the salary level from working to gain knowledge</p> <p>The company needs employees who are experienced and enthusiastic about running the business so that the business continues to progress.</p> <p>Staff turnover is very high where salary levels play a role and this results in disrupted business operations.</p>
Customer capital	<p>Very focused on customer complaints.</p> <p>Appoint an officer to manage customer complaints and also ensure employees are motivated to work.</p> <p>The company's motto is "Your satisfaction is our goal"</p>	<p>The company takes swift action in dealing with customer complaints and maintaining the quality of the food provided, leading to the development of the company.</p> <p>Employees who do not provide good service to customers will result in the company not performing.</p>
Structural capital	<p>The company has an accountant who manages the network system involving customers, banking, and databases.</p> <p>Using external services for IRB affairs</p>	<p>The company has 7 business branches in the Klang Valley.</p> <p>A variety of sales structures such as kiosks, food courts, canopies, and even mini catering allow businesses to grow rapidly.</p>
Social capital	<p>The workplace environment is kept neat and tidy.</p> <p>Having a good relationship with employees and customers such as organizing iftar ceremonies, and celebrating the Eid al Fitr festival.</p>	<p>Have a good relationship and take care of the welfare of employees in developing the company.</p> <p>Holding an annual dinner for employees so that they feel appreciated and enjoy working in this company.</p> <p>It is very important for companies to take care of the welfare of employees and customers in order to improve business performance.</p>

Technologic al capital	The company has its own machinery such as excavators to carry out installation and engineering works which will be an advantage to the company and can help improve the company's performance.	The company uses social media like Instagram, Facebook, and <i>tiktok</i> to get feedback/complaints from customers. Simple and neat food packaging for takeaway customers. Using cashless/online payment and facilitating business between the company and the customer.
Spiritual capital	The company emphasizes honesty in employees. The company encourages employees to participate in religious knowledge meetings Example of studying every Sunday night. The company also sends employees to perform Umrah once for each employee.	Require female employees to wear hijabs and maintain cleanliness, especially when preparing food. Emphasize religious matters such as prayer, and fasting of the workers. It is very important for employees to respect and provide the best service to customers and these benefits and increases profits for the company.

## CONCLUSION

In conclusion, this study offers substantial evidence from previous research to support the claim that components of IC are crucial to the success of SMEs. The success of SMEs relies heavily on the integration and efficient management of several types of intellectual capital, including human, customer, structural, social, technical, and spiritual capital. Insights like this help company owners, regulators, and executives make the most of their intangible assets, giving them a leg up in the marketplace. Effective management of intellectual capital assets is essential for the development and success of SMEs because of the financial constraints and limited capital resources they often face. SMEs may improve their competitiveness and overcome financial restrictions by gaining insight into the ways in which intellectual capital boosts production. Successfully managing and making use of these intangible assets may help SMEs reach their full potential and excel in the market.

The report also emphasizes how intellectual capital boosts SME production. Intellectual capital management best practices may help SMEs enhance output, centralize procedures, and improve efficiency. Managing and capitalizing on intangible assets may help SMEs overcome resource constraints and compete. Utilizing intellectual capital may help SMEs compete. It lets them innovate, adapt, and grow sustainably while spending less. Successful company owners understand the need of investing in human resources to establish a skilled workforce and a loyal client base. They may optimise the organization's architecture, nurture connections within and outside the enterprise, and utilise technology to improve technical and social capital. Spirituality and spiritual capital may increase an organization's bottom line. By promoting information interchange, IP protection, and technology infrastructure, policymakers may boost intellectual capital. By encouraging intellectual capital accumulation, policymakers can boost innovation, collaboration, and SMEs. SME managers may help their companies prosper by recognising and using intangible assets. Intellectual capital management and usage help SMEs reach their potential. Intellectual capital management may help SMEs overcome financial challenges and improve market performance.

Managers within SMEs can contribute to success by creating a culture that values and utilizes intangible resources. By recognizing and managing intellectual capital effectively, SMEs can mitigate budgetary limitations and improve their market performance. Entrepreneurs may overcome commercial challenges and gain market advantage by actively developing and using intellectual capital. Bumiputera SME owners should concentrate on accumulating intellectual capital components to boost intellectual capital. First, training and development programs may boost corporate growth by developing staff skills, knowledge, and expertise. Second, building client connections, understanding their requirements, and offering excellent service helps increase consumer capital and loyalty. Thirdly, optimizing organizational structures, processes, and systems to build structural capital may improve operational efficiency, workflows, and innovation. Fourthly, establishing social capital via networks,

collaborations, and partnerships within the Bumiputera community and outside may lead to new possibilities and resources. Finally, identifying and fostering spiritual capital may motivate workers, establish a great work culture, and help the firm succeed.

The fact that there were just two people involved in this study shouldn't take away from the important information we learned on how Bumiputera SMEs may grow their intellectual capital. Although this was a tiny study, the insights gained from the participants' thoughtful responses and personal experiences provide valuable lessons for other Bumiputera SME owners. This study emphasizes the importance of human capital (HC) to SME's performance, which is in line with other studies that have shown HC to be a possible source of competitive advantage for SMEs (Iqbal et al., 2023; Lang et al., 2022; Ramrez et al., 2021). Having a team of experienced and competent personnel is especially important for SMEs because of their limited resources. That's why it's so important for SME owners and managers to put an emphasis on personnel acquisition, development, and retention (AlQershi et al., 2022).

The owners and managers of SMEs have a duty to provide an environment that encourages teamwork, transparency, and lifelong education in the workplace. SMEs may improve their human capital and commercial performance by creating a culture that promotes information exchange, innovation, and the acquisition of new skills. In addition, SMEs should provide attractive compensation and benefits packages in order to recruit and retain top people. Providing workers with avenues for advancement in their careers is a great way to keep them interested in their work and increase their loyalty to the company. Despite the study's small sample size, the conclusions and suggestions it draws are useful for Bumiputera SMEs. Bumiputera SMEs may improve their competitiveness, respond to changing market dynamics, and expand sustainably if they learn to value their intellectual capital, especially their human capital.

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# ARTIFICIAL INTELLIGENCE VALUATION FRAMEWORK: A COMPREHENSIVE APPROACH

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## **ABSTRACT**

*The growing significance and applicability of artificial intelligence in all the fields of human endeavors has continued to grow and gain acceptability. Even though artificial intelligence adds value to the economy, there is still a lack of framework for the valuation of artificial intelligence. The primary aim of this study is to develop a framework for the valuation of artificial intelligence. The study employed literature review method to explore the strategy and technique for the framework of valuing artificial intelligence. Descriptive and exploratory strategy was employed to aid the comprehensive understanding of valuation process. The proposed framework identified several significant stages should be considered to arrive at the capital value which includes the identification of AI technology, the category that the AI technology belongs to, the AI feature and data collection, the existence of valuation parameter index, the selection of methodology, data collection application of valuation method and making the necessary adjustment, and capitalization. It can be concluded from these stages that artificial intelligence can be valued in the same way as other assets. The study recognize that economic, legal and other features of artificial intelligence are the distinguishing factor that aids in asserting the monetary value of the artificial intelligence. The above proposed framework for the valuation of artificial intelligence provide the tentative guide to arrive at fair and unbiased value of asset. The framework does not hinder the appraiser to employ adjustment techniques in the process of arriving at the capital value. Furthermore, the framework is highly recognizable to the approaches of valuation enumerated in the international valuation standard, royal institute of chartered surveyors, and international valuation council.*

**Keywords:** Artificial intelligence; technology; Valuation; Approach and framework

## **INTRODUCTION**

Stuart, & Norvig, (2016) cite complementary concepts of artificial intelligence that seek the creation of machines and computers that think and behave like people (even though limited to certain predefined applications, such as decision making, problem-solving, and learning). Artificial intelligence is the technology that through hardware and software systems that are capable of producing performances that, to a casual observer, would seem to be the sole preserve of natural (human) intellect, artificial intelligence enables thinking and acting humanely and reasonably (Moro Visconti, 2020).

Artificial intelligence is one of the best innovations in the world of technology, AI adds value to the process, product system, and procedures, due to the value and the potential aspect of the AI technology it accrued the feature to be exchanged for money in the economic market, AI technology has been a contributing factor to the national economy. Artificial intelligence technology has continued to be recognized in organizations due to the role it plays in the present generations (Yigitcanlar, 2020). A relatively new field called artificial intelligence has significantly advanced computer science as a whole throughout the years. Numerous academic fields, such as philosophy, mathematics, psychology, cybernetics, and cognitive sciences, have also influenced this one (Moro Visconti, 2020).

Artificial intelligence's pervasiveness and capacity to be applied to ever-wider alternatives and business models constitute a formidable innovation factor that may also be used to improve the qualities and possibilities of a portfolio of intangible resources. Artificial intelligence is the study of the

theoretical underpinnings, methodologies, and techniques that enable the building of hardware and software program systems capable of giving the computer abilities that, to the untrained eye, appear to be the sole domain of natural (human) intelligence.

Artificial intelligence was well known all over the globe in the year 2015 which is seen as the birth year of artificial intelligence. According to a report by Deloitte, the global Artificial intelligence sector can be worth a value of more than \$6 trillion by the year 2025, with a 30% compound annual growth rate therefore artificial intelligence is attracting more attention (Chi, et al 2021).

With the growing importance of artificial intelligence across all the sectors of human endeavors there is a need for a valuation framework for artificial intelligence so that the owners of the asset will recognize the actual value it works in an exchange, place for a loan and open market. Therefore, this study aimed to holistically develop a framework for the valuation of artificial intelligence as there is a lack of single research that covers the valuations framework for artificial intelligence.

## LITERATURE REVIEW

### The Concept Valuation and Artificial Intelligence Valuation

According to Olaniran, (2020); Vrbka *et al* (2020); French, & Gabrielli, (2018). Sees The most likely price for which an asset could be traded throughout the open market is determined through valuation. Asset valuation is critical in the economic, real estate industry, and financial sectors when making decisions about sales and purchases, leasing and renting property, and pledging property as a mortgage in lending and borrowing funds. Artificial intelligence is an asset that is not exceptional from the valuation worth ascertaining (Manolache, & Rusu, 2016; Chi, et al. 2021)

### Valuation Methods

In practice, a variety of different valuation methods are utilized, and the major purpose is to explore the benefits and drawbacks of each methodology. The challenge for management is deciding on the best approach for evaluating the best investment alternative to make the best investment decision. If the company has excess cash, it can either keep it and reinvest it or return it to its shareholders for dividends. If the cash is to be reinvested, the potential cost should be at least equal to the expected rate of return that the investors could have gotten from investment in capital assets.

Intangible asset valuation involves beyond the most obscure techniques or arcane calculations, according to Reilly and Schweihs (2016). The valuation of intangible assets is not a science in the same way that physics and chemistry are. There are natural correlations that can be quantified with certainty and precision in those fields. Pressure, volume, & temperature have exact connections in chemistry. There are exact correlations between mass, energy, and velocity in physics. Natural laws underpin these precise and predictable interactions. There have been no general principles of nature that apply to the value of intangible assets. Intangible asset valuation, on the other hand, is a science in the same way that mathematics and economics are. These soft sciences are founded on logical connections, orderly principles, consistency, and widely accepted analytical techniques. The many disciplines of mathematics, such as algebra, trigonometry, and calculus, operate efficiently thanks to such protocols. The different fields of economics, such as finance and economics, macroeconomics, land economics, and intangible asset assessment, all operate efficiently thanks to comparable procedures. Some analysts argue that valuation is essentially an art because it involves skill, experience, judgment, knowledge, research, and observation to apply the discipline. All of these qualities are required for the successful application of the subject. Physical chemistry, astrophysics, or any other hard subject, for example, might all benefit from the same approach. The explanation may be that the valuation field contains the best components of both art and science if the art vs science dispute is worth recognizing at all.

Accounting for intangible assets and intellectual property has long become a difficulty, according to Gordon and Smith (2005), because these assets do not fit neatly into traditional asset categories. The authors go on to say that intangible assets and intellectual property are becoming increasingly important to businesses and investors around the world and that there is a disconnect between what can be seen in a company's financial statements and the assets that drive the company's



earnings. They go on to say that current financial reports are far less informative than they could be since information on intangible assets and intellectual property is either missing or presented inconsistently. The accounting profession, on the other hand, is concerned about putting this type of accounting data because

- ❖ Forecasts are always required when defining intangible assets or intellectual property financially; descriptions of intangible assets are ambiguous; methods for valuing intangible assets are regarded to be imprecise.
- ❖ Intangible assets' economic useful lives might be hazy.

Because the world is uncertain, Palepu claims that precisely forecasting the future associated with capital outlays is virtually always difficult. Accounting addresses these issues by defining which sorts of assets can and cannot be recorded as assets. The economic benefits of research and development are generally regarded as highly uncertain, according to some authors, because research projects may never deliver the predicted new products, the products generated by research and development may not be financially sustainable, or the products may be rendered obsolete by competitor's research and innovation. As a result, research and development expenses must be expensed according to accounting regulations. Economic advantages from plants and machinery are regarded as less uncertain in these contracts and must be capitalized.

Even though it is true that estimating the economic benefits of many intangible assets is challenging, the intangibility of some assets doesn't entail that they are without value. Accounting standards' reluctance to show this value of assets has no bearing on their worth. Alternative sources of information on these assets must be investigated if they are not included in the balance sheet. Accounting theory indicates that any costs expended to produce intangible assets which are not explicitly identifiable should indeed be reported as an expense, according to Lev (2001). According to Lago, (2020). if one assumes that a business enterprise's equity value consists solely of its ordinary shares, there can be a significant difference between the value shown on the balance sheet (as a residual between assets and liabilities) and the value to an investor who applies completely different criteria to its quantifiable value. The financial statements of a company are only the beginning of the appraisal process for an investor.

There is an increasing number of approaches for measuring intangible assets, according to van den Berg (2001). He also believes that valuing intangible assets is critical for the following reasons:

- Socioeconomic Importance: To function, all markets require knowledge. Buyers must be aware of what sellers are offering for transactions to take place. If they do, prices will go up than necessary to account for the risks that purchasers assume while they are ill-informed. According to various estimations, intangible assets today account for the bulk of a company's worth.

The societal ramifications of failing to properly account for those assets and reveal their characteristics are numerous and significant. They include:

- ❖ using intangibles for widespread manipulation of financial information, excessive gains to corporate insiders from trading the stock of their companies,
- ❖ high volatility of stock prices, and
- ❖ the excessive cost of capital to intangible-intensive companies, hindering innovation and growth.

Economic prosperity is based on knowledge and its practical uses in this setting. This, according to the author, backs up the claim that intangible assets play a key role in determining enterprise value and national economic success. Nature and performance consequences of firms' strategies for developing, maintaining, and using knowledge for innovation are now a hot topics in the discipline of business strategy.

According to the author, the discussion is now about measuring knowledge assets rather than whether they exist. However, according to Yegge (2001), intangible asset value is a highly judgmental component of assessment that requires careful consideration. Many rating methods have been

established over the years to evaluate intangible value, according to the author, and many of them add logic to the argument and aid in the development of more defensible values. Technical expertise and experienced financial judgment must, however, prevail in the end. According to the author, the ultimate value judgment must pass cash flow analysis tests, and rating schemes that fail to do so aren't worth the paper they're written on.

### **Method of Intangible Assets Valuation**

Intellectual Property Corporation of Malaysia (MyIPO), Board of Valuers, Appraisers, Estate Agents and Property Managers Malaysia (BOVAEP), Malaysian valuation standard (MVS) (2019), Bouteillier (2001), International valuation standard IVS 2007, RICS (2020), and The American Society of Appraisers (ASA) outline Common Valuation Approaches Income Approach, Market Approach, and Cost Approach.

#### **i. Market Approach**

The market approach to intangible asset valuation is based accordingly to Reilly and Schweihs (2012) on the economic ideas of competitive environment and balance-related in that economic indicators will lead the market value of any better to a state of intersection in an open and free market. This value is frequently characterized as the estimated price, which is the price at which the property should sell in its relevant market. Smith and Parr (2000) point out that the approach in the market indicates value by comparing the price of a similar asset between a voluntary purchaser and seller, and by comparing the intangible assets in the transaction with the intangible asset in question.

The market approach uses a comparative examination to determine the value of an asset. A relative analysis can be performed when transaction values for similar intangible assets are known. Because precise transaction data is typically restricted, it is not always viable to value intangible assets directly using the market technique. In some circumstances, however, historical transaction values of governmental licenses such as liquor licenses and water rights are publicly available, allowing for a straight market-based approach. Market-based data, on the other hand, might be used as inputs for an income approach value analysis. A contract between two unrelated parties, for example, could supply market-based information that a royalty rate could use, as explained further down. As an example, Furthermore, unrelated real estate leases are market-based statistics. When market-based data is available, the market and income approaches are frequently combined. Market-based data are frequently seen as creating key inputs related to the appraisal of intangible assets, particularly in developing future financial information and costing capital.

The market approach would be calculated in a valuation project by comparing the attributes of a similar, comparable asset. It makes sense to explore common intangible assets in other organizations and evaluate past intangible asset transactions when it comes to intangible assets. As previously said, one of the main reason intangibles are problematic is there is no liquid and transparent market on which they may be traded. This technique does not operate as effectively as it should due to a lack of demand for intangibles. There are, nevertheless, many benchmarking opportunities. It's also difficult to find a previous intangible asset link to compare to the asset in question. Even if the asset is found, assigning a specific value to it is challenging because most activities are processed in bundles, with the cash paid reflecting the worth of a group of properties.

The requirements for the successful implementation of the market valuation approach are:

- i. The existence of an active market involving comparable property;
- ii. Past transactions of comparable property;
- iii. Access to price information at which comparable property is exchanged;
- iv. Arm's length transactions between independent parties.

Visconti, (2020). State that the most difficult aspect of the market method is comparability, as unique intellectual property transactions are relatively uncommon. Even if pricing data for a single intellectual property transaction exists, the price where the property was traded is unlikely to affect the value of other intellectual property unless there is a positive comparison. Reilly and Schweihs (1998), and Visconti, (2020) agree a comparison analysis should be conducted to identify commonalities and

dissimilarities among intangible assets and transaction data that may affect value, such as differences in property rights appraisal, buyer and seller motivations, financing terms, market conditions at the time of sale, size attributes, and economic characteristics.

The market approach can determine the value of the intellectual property or intangible assets by estimating the value of the entire enterprise within which the IP or intangible sits, according to Parr, (2018). After allocating the value among all of the other asset categories, there is usually a residual amount that can be attributed to intangible or intellectual property, like strong trademarks, copyright, distribution networks, or proprietary technology. This is almost often founded on the assumption that the value of intangible assets or intellectual property is reliant on its successful commercialization, which is in turn based on the value of the corporate firm in which it lives.

There are four potential market approach strategies, according to Reilly and Schweihs (1998), which will be briefly addressed hereunder.

**i. Method of a Business Transaction:**

The formula computes the value of a particular intangible asset using actual market transactions, such as the sale of comparable or benchmark intangible assets to third parties at arm's length. This is the most direct and systematic way to value estimate when data is available. This method is made up of three steps that are all interconnected:

- The first is an assessment of the relative economic strength and weaknesses of each market observation and the subject intangible asset;
- The second is the identification and quantification of adjustment factors related to the differences between the market observations (the comparable guideline transaction) and the subject intangible asset.
- The third is the analysis, by which the valuation multiples are estimated and applied to the appropriate subject intangible asset financial parameter (e.g. sales operating profit, cost, etc) to estimate the value indication via the sales transaction method.

The availability of fairly comparable transactions involving the arm's length sale of intangible assets is the fundamental condition for utilizing the sales transaction method. According to the authors, this method is particularly useful for valuing seasoned or mature intangible assets so because the majority of reported guideline transactions involve mature intangible assets.

**ii. Relief from Royalty Method**

Because the predicted royalty income is capitalized to arrive at a value indication, this method is frequently referred to as an income approach valuation method. The subject's intangible asset is valued using this method by assessing the number of royalty income it would earn if the intangible asset were to be sold. The net revenues expected from all sources by the subject intangible asset throughout its anticipated life span are then multiplied by a baseline royalty rate. The result is an estimation of the royalties that could be generated by licensing the intangible asset in question.

**iii. Comparative Income Differential Method**

In some cases, market data may allow the analyst to compare the income earned by two similar operations, one of which uses an intangible asset and the other which does not. The value of an intangible asset can be estimated using the comparative income difference approach when these two processes consistently generate considerably different income.

**iv. Market Replacement Cost Method**

This strategy considers the marketplace replacement cost including its intangible asset. While the typical replacement cost technique starts with the intangible asset's owner's annual reports, this method takes into account estimations of the intangible asset's replacement cost from experienced outsiders. If realistic arm's length estimates can be obtained, the intangible asset's replacement cost can be reliably estimated using market data.

### **Disadvantages of Market methods**

Those methodologies, according to Bouteiller (2001), offer the most direct and efficient approaches to the valuation of intangibles, even if their execution is dependent on available information and reliable transactional data. Because of the following characteristics, their actual implementation has some limitations:

- (a) Most intangibles are not sufficiently traded to determine a comparable market value;
- (b) Intangible assets are more frequently traded with a business including tangible assets and are difficult to dissociate from; and
- (c) They may be unique and similar transactions do not exist.

Furthermore, market cycles or the particular interests of buyers, such as strategic or competitive premiums, might cause distortions. As a result, experts regard changes to those characteristics as "critical" to keeping the market strategy relevant. Despite this, the "fair" market value is the most relevant criterion of value in market approaches. The following components normally require careful consideration when selecting and reviewing guideline sales or licensing transactions: an appraisal of property rights, reasons for the transaction, financing terms, market conditions, size, attributes, and economic state at the time of sale. The market value is commonly calculated by multiplying the price of guideline transactions by some relevant variable derived from the financial accounts of the guideline transaction, the market potential, or future profits predictions. Their selection may appear subjective, as evidenced by the several elements of comparison shown above. Intangible assets are notoriously difficult to collect due to their one-of-a-kind nature and potential lack of marketability.

They pose significant challenges when it comes to implementing market-based solutions (Bouteiller, 2001, Reilly and Schweihs, 1998). Transactions of individual items of intellectual property are still infrequent, according to Smith and Parr (2000). Comparability is the most difficult part of the market approach when it comes to intangible assets. Even if pricing data for a specific transaction involving a specific intangible asset was available, the cost at which the property was traded is unlikely to affect the value of many other intangible assets until there is positive comparability.

According to Smith and Parr (2000), the market approach is the most straightforward and straightforward appraisal method. It determines the current value of future benefits by reaching a consensus on what other market participants believe it to be. However, there are two prerequisites: an active market and a similar property exchange. The toughest issue, however, is to identify an arm's length sale of a replica property on the same day as the valuation for a subject property. According to the authors, this does not occur frequently enough to eliminate the requirement for changes when comparable assets aren't identical.

In other circumstances, it may be required to use sale data that is not current with the appraisal. The appraiser must accommodate the price fluctuations over time in this situation. This may demand separate research of property value fluctuations in the subject industry over a recent period to produce some specific indices to employ in the valuation procedure. According to Smith and Parr (2000), the market approach is most effective for real estate, machinery, and equipment in general use, vehicles, general-purpose computer programs, computer hardware, liquor licenses, and franchises, but is typically the least effective for most intangible assets and intellectual property. The analyst arrives at the bottom line of fair market value using the market approach. The presumption is that the previous buyer of the comparable property was willing, had all relevant facts in hand, and made a fair and reasonable agreement. As a result, reflected market value for such asset at that time.

### **Cost Approach**

The cost approach attempts to quantify the future advantages of ownership by calculating the number of resources needed to replace the subject asset's future service capability. This strategy is based on the concept that the cost of a new property is proportional to the economic worth of the function it can give during its useful life (Gordon et al., 2000; Pastor et al., 2017). The cost approach is one of the intangible asset's value determining elements, establishing the monetary worth of an intangible asset based on its limited reproduction time. According to Anastasio (2020), the cost approach, also known as the cost of

the appropriate alternative, lies on the condition or assumption that in an armless transaction, a cautious individual buyer or investor will pay nothing more than the cost of developing substitute assets with the same serviceability. This approach to valuation is based on the substitution concept.

Cost techniques are classical methodologies for intangibles' appraisal, according to Thornton (2013), Anastasio (2020), and Reilly & Schweihs (1998). For its value, numerous related analytical methodologies (creation/recreation, historical/perspective, reproduction/replacement, avoidance cost) are applicable. However, replication and replacement costs are the most typical.

The anticipated cost of creating an exact copy or replica of the subject intangible asset, utilizing the same materials, production standards, design, layout, and quality of workmanship as the subject intangible asset, at current prices as of the date of the analysis. The subject's intangible asset will have the same flaws, super-flaws, and obsolescence as the subject's intangible asset. Replacement cost is the anticipated cost of creating an intangible asset with a similar utility to the subject intangible using modern materials, production standards, design, layout, and workmanship at current costs as of the date of the analysis. All curable deficiencies, super-adequacies, and depreciation present inside the original intangible asset would be absent from the substitute intangible.

When two requirements are met, the reproducing cost and the replacement cost provide an "acceptable" estimate of the value of intangibles:

- ❖ The first one is to include all the cost components of the intangible;
- ❖ The second one (unless it is brand new) is to reduce it for all forms of obsolescence.

When it comes to intangibles, putting together all of the cost components is the extra step because they are the product of multiple and accumulated expenses and are frequently linked to tangible assets. Materials, labor, and overheads are all factored into the standard method. It should also include the developer's profit and entrepreneurial motivation, both of which are difficult to value for intangible assets due to their unclear nature and related risk.

In the situation of faulty record-keeping, according to Baum, et al. (2021), Anastasio (2020); Smith and Parr (2000), recreation cost is the most appropriate technique. The total of all expenses related to the intangible asset is an indication of the cost to recreate the asset in this case. Adjustment for factors of obsolescence, on the other hand, must be considered. The physical depreciation must then be accounted for. And to the fair market value of company property and its earning capacity are inextricably linked. As a result, fair market value is determined using the cost approach's equation:

$$CV = COR - PD - FO$$

Where:

*CV: Cost of reproduction less depreciation and obsolescence*

*COR: Cost of reproduction*

*PD: Physical depreciation;*

*FO: Functional obsolescence.*

Thornton (2013). stated The language in International Accounting Standard 38 (International Accounting Standards Board, 1998) underlines that an intangible asset should be evaluated at cost from the start. The cost of purchasing an intangible asset as an intangible asset comprises both the item's acquisition price and the expenditures directly connected with preparing it for its intended use (intangible asset constituted cost).

### **Disadvantages of the Cost Approach**

The cost method, according to Bouteiller (2001), provides a realistic estimate of the worth of intangible assets provided two requirements are met: the first is to include all of the intangible's costs components, and the second is to lower it for all kinds of obsolescence. When it comes to intangible assets, putting all of the cost components together is challenging since they are the consequence of many and cumulative expenses, which are frequently closely connected with intangible assets. Materials, labor, and overheads are all factored into the standard method. As a result, distinguishing between regular

operational expenditures and intangible asset investment spending is challenging. Choosing the appropriate costs of reference creates further concerns. Historical costs are objective, consistent, and trustworthy, yet they have limits in practice. For older intangible assets, there is frequently a scarcity of useful data. It is impossible to distinguish between expenses required to preserve the value of intangible assets and investments aimed at increasing their value. Adjustments may not represent current pricing since past costs reflect a specific scenario or market price. The replacement and recreation costs are intended to alleviate this ambiguity; nevertheless, they do not address the issue of the current necessary expenses of reproducing the intangible asset. Intangible assets have a history that primarily dictates their characteristics, and it may be difficult to reproduce some intangible assets that are irreplaceable at this time. Furthermore, because certain intangible assets are not replaceable, the subjective aspect of estimating replacement costs is not always straightforward.

The cost technique, according to Smith and Parr (2000) is particularly effective for evaluating highly specialized properties such as a foundry, a reservoir, steel mill, nuclear reactor, or power plants. Computer software, an integrated workforce, corporate processes, quality control methods, design documents, assembly practices, buying procedures, packaging designs, and supply chains may all benefit from the cost strategy. To evaluate the value of an intangible asset, identifying and evaluating obsolescence is likewise a difficult task. Functional, technological, and external obsolescence are all frequent types of obsolescence.

Their measurement necessitates extra caution to distinguish intangible asset obsolescence from that of the corresponding tangible asset and to utilize solely intangible asset obsolescence. Qualitative approaches such as "Life Cycle Analysis" and "Remaining Useful Life" can aid in determining an intangible's obsolescence. The basic and implicit assumption that expenditures should always produce value is the major limitation of cost-related approaches. Given the varying performance of new intangible assets (e.g., brands) introduced to the market, this premise may be unsustainable (Bouteiller, 2001).

The basic and implicit assumption that expenditure should always produce value is the major limitation of cost-based methods. The cost does not equal value; until the economic advantages received for owning the property outweigh the cost of developing the intangible asset, the value of the property is low. Because unique assets have limited utility outside of a certain firm, they may suffer greatly. Other assets with a broad use may only lose value to the extent that the costs of removing them from the business, transporting them, and installing them in a new business and location for use in a more profitable industry.

Many of the essential elements that create value, according to Lago, (2020); Bouteiller, 2001); Smith and Parr (2000:), are not immediately represented in the technique and must be evaluated separately from the basic cost approach process, namely:

- ❖ the cost approach does not directly incorporate information about the number of economic benefits associated with the intangible asset. These benefits are driven by demand for the intangible asset and the profits that can be generated;
- ❖ information concerning the trend of economic benefits is also missing from consideration.

Intangible assets that provide economic advantages and increase at a faster rate are considerably more valuable than those that grow at a slower rate. Social views, demography, and competitive pressures all influence this development, but the conventional method fails to measure the impact on value.

- ❖ The duration over which the economic benefits will be enjoyed is another element not directly considered that has a significant effect on value. The economic remaining life of the property is a vital component to a value conclusion;
- ❖ The risk associated with receiving the expected economic benefits is not directly factored into the cost approach model. Where a higher degree of risk makes the realization of expectations speculative, a lower value should correspond;
- ❖ The adjustments that are necessary to reflect the effects of obsolescence must be separately calculated and are often difficult to quantify.

- ❖ Intellectual Property Cooperation Malaysia (MyIPO) and Malaysian Valuation Standard (MVS) also point out the disadvantage of the cost method That it is subject to many assumptions: future cash flows and discount rate.

### **Income Approach**

The revenue method shifts the focus away from the expense of developing or establishing a new property and instead considers the property's capacity to generate income. The fundamental assumption is that the present value of the net economic benefit to be obtained throughout the life of the property may be used to determine its worth. The income method is based on the premise that assets are only valued by what they can generate in the open market, and the actual measure of asset worth is the profits of the assets when compared to the risk in the business scenario (Dlaskova, & Cipovova, 2018). The present value of an asset's future economic benefits is used to determine its worth. (Kovac, et al., 2017). Any income, savings, tax deductions, and so on are all considered benefits in this sense. In this case, the value of the project/asset would be the value of those benefits, lowered to a rate of return computed at the project/risk. Immaterial assets, such as patents and proprietorship rights, are frequently evaluated and analyzed using this method. (Tkachenko, *et al* 2017) The primary disadvantages of this kind of valuation approach are the uncertainty and complexity of evaluating the prospective revenue stream. The selection of the most appropriate discount rate is also a critical issue that should be carefully considered.

As previously indicated, income-based techniques are commonly used to evaluate intangible assets. When the intangible asset provides income or cash flow, the income approach strategy is the best option. The most popular income-based strategies are Relief from Royalty, Multi-Period Excess Earnings, Greenfield, and Avoided Loss of Income. Below, we go through each approach in further depth.

The yield capitalization technique and the direct capitalization approach, according to Bouteiller (2001), are two types of income methods. According to Reilly and Schweih's (1998), the present value of the expected economic revenue associated with the acquisition, use, or forbearance of an intangible asset is the present value of the expected economic income connected with the ownership, use, or forbearance of that intangible asset. Even though the two techniques use distinct mechanical procedures to calculate the present value, they both aim to calculate the present value of projected future economic revenue. Components of the Income Approach in General According to Damodaran (2001), the value of assets ought to be a function of three factors:

- ❖ how much the asset generates in cash flows;
- ❖ when these cash flows are expected to occur; and
- ❖ the uncertainty associated with these cash flows.

The discounted cash flow valuation, according to the author, combines all three of these factors by estimating the asset's value as the present value of its projected future cash flows. According to the aforementioned author, three fundamentals determine the value of a business: a firm's ability to generate working capital from invested capital; a firm's ability to generate working capital from invested capital; and a firm's ability to generate cash flows from existing investments. Companies with greater cash flows from current investments should be valued more than companies with lower or negative cash flows; the projected increase in these cash flows over time. Firms that anticipate expanding quicker in the future should be worth more than those that plan to grow slower;

The aforementioned three elements of the income approach are reaffirmed by Reilly, & Schweih's, (2016): the amount of the income stream that can be generated by the intangible asset; the presumption as to the period of the revenue stream; and the presumption as to the risk associated with the sudden realization of the predicted income, which three factors are illustrated by the general formula below, based on the assimilation of the ass:

$$V = Ir$$

Where:

$V$  = the value of the earnings stream attributable to the intangible asset.

$I$  = Income derived from the employment of the intangible asset, representing the net cash inflows and outflows.

$r$  = Capitalisation rate reflecting all the business, economic and regulatory conditions affecting the risk associated with employing the intangible asset and achieving the prospective earnings.

### **Component of Income approach**

Nichita, (2019) states that the following components; that as far as it relates to income contributions in respect of intangible assets, income can be classified into three categories:

- ❖ Income derived from increases in revenues;
- ❖ Income derived from decreases in expenses and costs;
- ❖ Income derived decreases in investments.

The assignment of that percentage of revenues earned by a firm that is provided by intangible assets is the problem connected with the income component. Profit alone is insufficient to justify and sustain the assignment of value to intangible assets. Earnings from a company's activities must be steady enough to provide a reasonable rate of return over the entire life of investment in intangible and complementary assets.

There are three types of assets in a business: financial assets, tangible assets, and intangible assets. The combination of employment of most of these assets generates economic benefits. The enterprise's aggregate net income can be assigned to its components based on the proportionate importance of each category of these assets and the associated risk (Nichita, 2019).

It was believed that the quantity of net cash flow to be obtained from the intangible asset's employment is the greatest indicator of the future stream of economic benefits. This should take into account both the costs of doing the company and the additional capital expenditure required to maintain that cash flow. The net amount indicates the economic advantages gained from property ownership after accounting for these future uses of gross cash flow. While cash flow, growth, and risk remain the drivers of value, Damodaran (2001) warns that growth has an excessively significant role in determining value. However, it is growing with surplus returns that produce value, as businesses may expand at high rates while creating little value or even destroying value by earning less than is necessary on new investments.

### **Economic Life**

Another difficulty with the income method is estimating the useful life of an intangible asset to quantify the future cash flows that will be created by the intangible asset's useful life. Intangible asset value, according to Nichita,(2019), is frequently defined as the present value of future cash flows projected to be obtained from the ownership or use of an intangible asset during the intangible asset's remaining economic life. The intangible asset owner believes that it is no longer profitable to employ the intangible asset at the end of its economic life. As a result, the value of an intangible asset is a function of its potential economic life, and estimating the remaining usable life of an intangible asset is typically required when estimating its value. the economic life of an asset is the time during which its usage is profitable. When the asset is no longer profitable to use as an asset, or when it is more profitable to use another asset, its economic life comes to an end.

### **Classification of Valuation Method**





Location attached value	✓			×						Significant
Abstract value	✓									Significant
Transferability	✓		×							Significant
Infringements right	✓		×							Significant
Capital recoupable	✓	×								Significant
Depreciation	✓	×								Significant

## METHODOLOGY

This research aims to develop a framework for the valuation of artificial intelligence, this study conceptual the idea of the framework development through several literature reviews after identifying the lack of the framework developed for artificial intelligence, this study used the Scopus, emerald, and other data for data collection, where consideration year range was given from 2015 to 2022. this study employed a descriptive and exploratory research strategy as the descriptive strategy was used in describing the various stages in the framework while the exploratory strategy was used after the issues were identified and the new findings were explored in the framework. Furthermore, in this study, the framework was developed based on the valuation protocol of the IVC, RICS IVS.

## RESULT AND DISCUSSION

From the literature and guideline reviewed the below framework was proposed

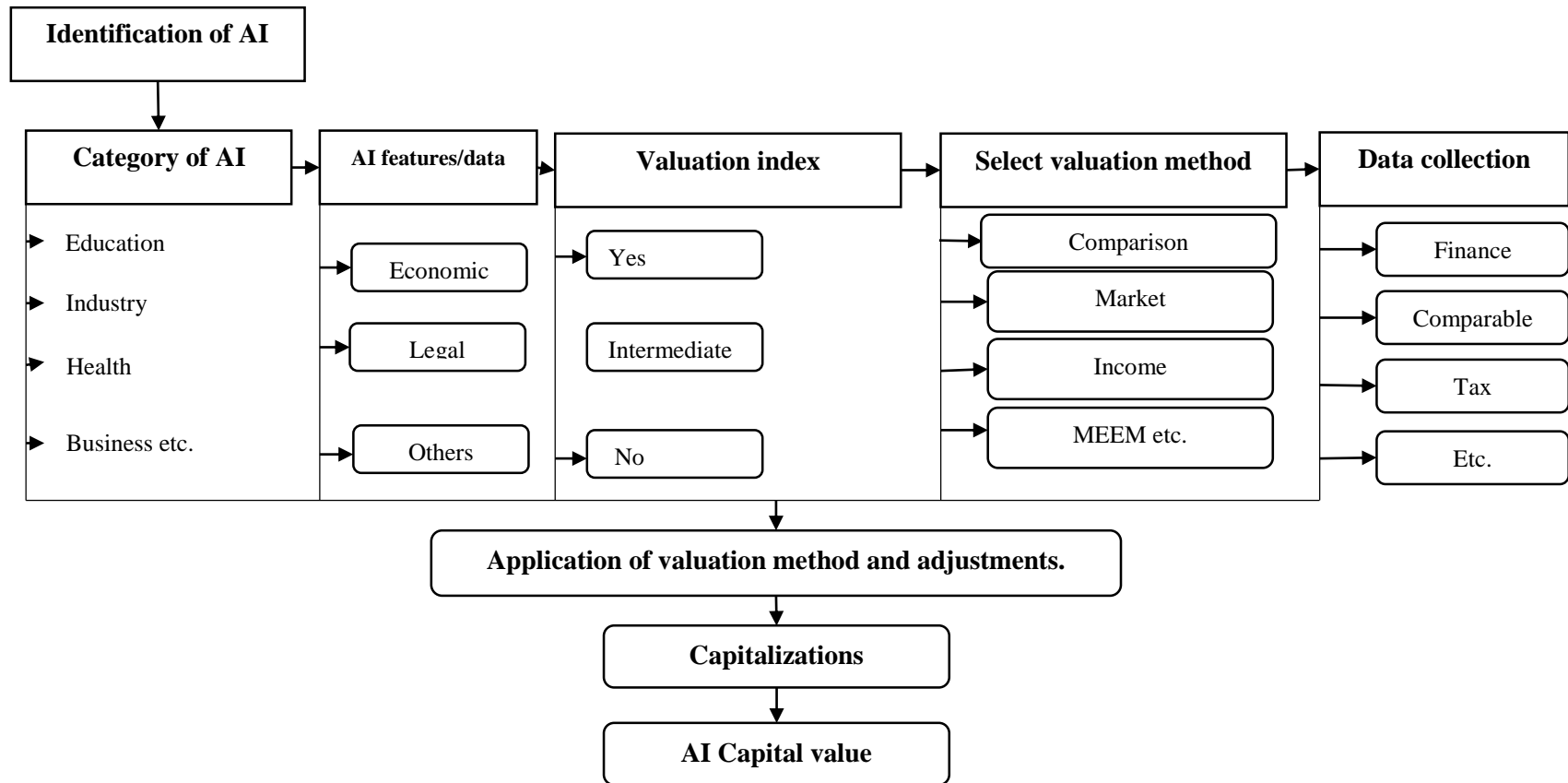


FIG 4.1: The propose framework for valuation framework

From the above fig 4.1: above is the proposed framework for the valuation of artificial intelligence. The framework was developed in terms of stages which started as follows

### **Identify the artificial intelligence**

This is the first stage of the valuation of the AI technology as proposed based on the IVC, RICS IVS. Valuation guidelines in every valuation practice there must be an existing asset either in abstract to be identified through a document or physically identifiable, according to the proposed framework the said identified asset should by function, benefit, or physical possess the features of the AI technology as prescribed by the information and communication technology boards.

### **Categories of the artificial intelligence**

After the identification of the asset, categorization of the asset persists which sector does the AI belong to there are several categories where artificial intelligence may belong which are as follows

#### **i. The Educational Artificial Intelligence:**

Numerous industries are undergoing upheaval due to technological innovation. Two interrelated technologies that have an impact on our daily lives are the internet and mobile phones. While there is a lively discussion on how much screen time parents, teachers, and psychologists should allow their children to spend. Another technology that is developing quickly has the potential to drastically alter the nature of the education industry. this is a category of artificial intelligence which are purely used in the education domain.

Three areas are involved in the relationship between AI and education: learning with AI (for example, using tools powered by AI in classrooms), learning about AI (its technologies and techniques), and preparing for AI (e.g. enabling all citizens to better understand the potential impact of AI on human lives). The latter two linkages are what the "Teaching artificial intelligence at school" initiative is now concentrating on. The objective is to help school students' training programs incorporate both the human and the technical components of AI. Empowering young people starts with piloting capacity building of curriculum developers and expert trainers from chosen national institutions. It was captured in the study of Roll, & Wylie, (2016).; Holmes, et al., 2020; Knox, 2020); Pedro, et al.,2019 that artificial intelligence plays a huge role in education.

#### **ii. Industrial Artificial Intelligence:**

All the industries are trying to minimize the cost of labor and also to adopt automation due to the speed of production of goods and services the use of artificial intelligence in the industries come in through the constant adoption of technology in their process of producing goods and services

#### **iii. Health Artificial Intelligence:**

The health sector has not opted out of the sectors adopting the use of artificial intelligence for example in the case of natural language processing for more than 50 years, healthcare and artificial intelligence have worked to understand human language. The majority of NLP systems combine translation with voice recognition or text analysis. Applications for natural language processing (NLP) that can comprehend and categorize clinical documentation are frequently used in the healthcare industry. Unstructured clinical notes can be analyzed by NLP systems, providing a wealth of knowledge that can be used to enhance procedures, comprehend quality, and provide better outcomes for patients.

#### **iv. Business Artificial Intelligence:**

This is a kind of artificial intelligence which applied in our daily business. The ratio of humans to machines in sales is currently being reevaluated by seasoned salespeople and sales organizations. Sales are already being impacted by automation AI and will continue to be. A Harvard Business Review study found that

businesses utilizing AI for sales can improve leads by more than 50%, cut call times by 60–70%, and lower costs by 40–60%. These figures make it abundantly evident that business owners looking to increase their bottom line should investigate artificial intelligence. Furthermore, AI is also applicable in marketing, customers support, accounting, human resource, contact center, and the operation of the business.

#### **Features of Artificial Intelligence and Data:**

This is the stage that aims at collecting some essential data and identifying the attributes of the artificial intelligence based on three classes which are the economy, legal, and others that will be considered worthy in the valuation process

#### **Valuation Parameter Index**

After the identification, there is a need for confirmation are the valuation parameter index because they are the feature to give fair and unbiased capital value.

#### **Selection of Valuation Method**

This is the stage where the valuer may choose which valuation approach should he depend on to arrive at the capital value of the artificial intelligence, there are several methods of valuation which include the cost, the market, the profit, multiple excesses earning, and other methods.

#### **Data Collection**

Data collection stage after the appraiser has identified the method to be used then he also knows what information is needed for the use of the method

#### **Application of the Method Capitalization and Adjustment**

At this stage, the appraiser needs to capitalize the applicable rate and do the necessary adjustments  
Capital value

### **CONCLUSION**

From this valuation stage explore in the above framework it was found that Artificial intelligence can be valued in the same way as other assets are done, the economic, legal and other features of artificial intelligence has been recognized as the distinguishing factor that can aid in asserting the monetary value of the artificial intelligence, the above-proposed framework for the valuation of artificial intelligence provide the tentative guide to arrive at the fair and unbiased value of an asset, the framework does not hinder the appraiser to employees is adjustment techniques in the process of arriving at the capital value. Furthermore, the framework is highly recognizable to the approaches of valuation enumerated in the international valuation standard, IVS, royal institute of chartered surveyors, and international valuation council.

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# EFFECTS OF INFLATION AND CORRUPTION ON PERCEIVED TAX EVASION: EVIDENCE FROM ASEAN COUNTRIES

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## **ABSTRACT**

*Inflation eroded real income, decreased purchasing power, and distorts the payment of fixed interest rates. Corruption increases inequality and poverty among citizens, especially vulnerable individuals who are highly affected by corruption. The objective of the study is to examine the effects of selected macroeconomic variables, which include inflation and corruption, on perceived tax evasion among the ten ASEAN countries. A quantitative research approach was adopted, and secondary data was collected from OECD and World Bank databases for the period of 10 years from 2011 to 2020. Cross-sectional time-series feasible generalization least square (FGLS) was used to analyze the data. The result revealed a positive and significant relationship between inflation and perceived tax evasion, the result further shows a positive but insignificant relationship between corruption and perceived tax evasion among the ASEAN countries. This finding implies that any increase in inflation would increase the level of tax evasion among ASEAN taxpayers. More so, any increase in the level of corruption would positively increase tax evasion, but not significantly. Therefore, policymakers in ASEAN countries are encouraged to provide more robust macroeconomic policies to reduce the level of inflation and corruption in their various countries which can improve their tax revenue, and in turn, enhance their economic growth and development.*

**Keywords:** *Inflation; corruption; ASEAN; macroeconomics variables*

## **INTRODUCTION**

Inflation, corruption and tax evasion are three phenomenon which affects virtually both developed and developing economies. Specifically developing countries are mostly heat by these monstars. A group of developing countries such as Association of Southeast Asian Nations (ASEAN) was one of the growing regions of the world recently, Asian Development Bank (ADB) forecasted that the region would experience 5.5% economic growth in 2022 (ADB, 2021). The setting of ASEAN agenda 2020



way back in 1997 had foster and demonstrated that ASEAN are highly competitive region economically envisaged through free capital flow, significant reduction in poverty level, free flow of goods, services, investment, an even economic development, as well as economic disparities (ASEAN, 2023). As a result of their economic corporations ASEAN have about \$2.3 trillion market size with more than 600 million people, and this region further strive to form a strong regional economic integration which targeted at achieving a distinct unified market for better economic growth of ASEAN. As pointed earlier developing countries are unavoidably affected by inflation, ASEAN countries are amongst those bedevilled with inflation, this is evident in the work of Jiranyakul and Opiela (2010) who reported that there is an increase in inflation in five ASEAN countries due to rising inflation uncertainty. Correspondingly, Thanh, (2015) affirms that inflation hinder economic growth in five ASEAN countries. Notwithstanding, corruption on the other hand exist in ASEAN countries (Zandi, Haseeb & Zainal Abidin, 2019). Similarly, corruption increases poverty in ASEAN countries (Rahayu & Widodo, 2013). More so, tax evasion also exist in most of the ASEAN countries, Din, Habibullah and Baharom (2018) stresses that an increase level of economic activities in ASEAN countries between 1980 -2013 increases tax evasion. Consequently, these studies provide evidence that inflation, corruption and tax evasion exist among ASEAN countries despite their potential economic growth due to their strong economic corporation. The effect of inflation and corruption on perceived tax evasion among ASEAN countries is lacking in the current literature. This inference will be a novel one and no doubt will serve as policy tools for economic realignment of the ASEAN countries. This study collected data from the 10<sup>th</sup> ASEAN countries comprises; Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, The Philippines, Singapore, Thailand and Vietnam for ten years, spanning 2011 to 2020. Most of the previous studies concentrate on one of the variables of this study and selected few countries, for instance, Jiranyakul and Opiela (2010) study inflation and focused on five countries only. Likewise Thanh (2015) examine inflation on five ASEAN countries. Therefore, this study differ significantly with the previous studies, current study examine the effect of inflation, corruption on perceived tax evasion in ten ASEAN countries for ten years period.

The reminder of this study comprises: section two which cover theory, concept of the variables, and hypotheses of the study. Section three, provide the methodology adapted, section four cover the result of the data analysis. Section five provide the conclusions and policy implications.

## LITERATURE REVIEW

### Deterrence Theory

The Economics-of-Crime-Approach, originally proposed by Becker (1968), forms the basis for the Deterrence Theory. According to the theory, people's actions are primarily guided by the expected costs and rewards associated with them. This theory also explains how the threat of sanctions and punishments can deter individuals from engaging in illegal activities. In essence, the theory holds that criminal behaviour is primarily influenced by the differences in the cost-benefit analysis rather than variations in motivational factors.

Allingham and Sandmo (1972) first applied the Deterrence Theory to the study of tax evasion behaviour. The theory suggests that taxpayers weigh the potential costs and benefits of evading taxes based on rational decision-making under uncertainty and risk. Taxpayers' decisions to comply or evade taxes are primarily driven by their economic self-interest, according to Hamm (1995). Deterrence Theory proposes: variations in the commission of crimes among individuals are not driven by differences in their motivation to engage in criminal activity but by their expectations of the cost associated with costs and benefits. In other words, the theory suggests that individuals are rational actors who seek to maximize their expected utility (Alm et al., 2017). Accordingly, inflation and corruption can be factors that motivate taxpayers to engage in tax evasion. As inflation erodes the value of money, taxpayers may feel that the tax burden is becoming heavier and may be more inclined to evade taxes. Similarly, corruption may undermine taxpayers' trust in the government and tax authorities, leading them to believe that taxes are not being used effectively or fairly, which can reduce tax compliance.

## **Tax Evasion**

Tax evasion is a global issue that affects both developed and developing countries. According to a recent study by Huynh and Nguyen (2020), the average annual tax evasion rate worldwide is estimated to be around 6.5% of GDP. In Asian countries, tax evasion rates are also a major concern. Nguyen (2022) found that tax evasion in Vietnam is widespread and deeply rooted in the country's informal economy. Similarly, Farooq and Yasmin (2017) revealed that tax evasion is a serious problem in Pakistan, with high-income individuals and corporations being the main culprits. Tax evasion is a pervasive problem in many Asian countries, with numerous factors contributing to its prevalence. A lack of trust in the government and tax authorities, complex tax laws, and weak enforcement mechanisms are major drivers of tax evasion in Malaysia (Rabbi & Almutairi, 2021). Likewise, Abd Obaid et al. (2020) claimed that Yemen suffers from widespread corruption, poor tax administration, and the absence of a tax culture among citizens all contribute to high levels of tax evasion in the country.

Pham et al. (2020) found that improving tax administration and increasing the transparency of tax policies can increase tax compliance and reduce tax evasion. A study by Kim and Lee (2021) in South Korea found that e-filing and e-payment systems increase tax compliance and reduce tax evasion. A simplified tax system and better tax administration can improve tax compliance and reduce tax evasion (Le, 2020). Inasius (2019) reported that taxpayer trust and power are effective in improving voluntary tax compliance and reducing tax evasion among Indonesian taxpayers. Additionally, according to Oanh and Gan (2022), the effectiveness of the board of directors in monitoring management can amplify the favourable impact of corporate tax avoidance on firm value.

## **GDP per capita**

GDP per capita is another factor that has been found to influence tax evasion rates in Asian countries. Tsai et al. (2021) suggested that higher GDP per capita is associated with lower levels of tax evasion in China. Nurim et al. (2020) also argued that a higher GDP per capita is associated with higher levels of tax compliance. However, the relationship between GDP per capita and tax evasion is not always straightforward. McGee et al. (2021) in their study found that while higher GDP per capita is associated with lower tax evasion rates, the effect is weaker in regions with higher levels of income inequality in Japan. The level of economic development can have a significant impact on tax evasion rates. This is supported by Irawan and Utama (2021) who revealed that higher GDP per capita is associated with lower tax evasion rates in India.

## **Annual GDP growth**

The relationship between tax evasion and GDP growth is more complex. Prior research such as Alsmady (2022) argued that tax evasion initially increases with GDP growth but eventually decreases as the economy becomes more developed and tax compliance improves. A study by Nguyen (2022) also found that higher levels of annual GDP growth are associated with lower tax evasion rates in Vietnam. Liang et al. (2021) reported evidence from China's context and suggested that while higher GDP growth is associated with lower tax evasion rates, the effect is weaker in regions with high levels of income inequality. In Pakistan, Ahad et al. (2021) also indicated that higher annual GDP growth rates lead to lower levels of tax evasion. The authors suggest that increased economic activity and job opportunities reduce the incentive for individuals to evade taxes. Similarly, Murshed and Saadat (2018) found that higher annual GDP growth rates reduce tax evasion in Bangladesh. In contrast, Xia et al. (2017) showed that higher annual GDP growth rates increase tax evasion. Overall, these studies suggest that the relationship between annual GDP growth rates and tax evasion is complex and context-dependent, with factors such as economic opportunities, compliance behaviour, and perceptions of fairness influencing the direction and magnitude of the relationship. Based on the literature above, couple with lack of study that specifically examine the influence of GDP annual growth on perceived tax evasion among asean countries, the following hypothesis developed.

**H1.** There is negative relationship between GDP annual growth and perceived tax evasion in ASEAN countries

## **Inflation**

Inflation refers to the increase in the general price level of goods and services in an economy over time. It is assumed that higher inflation rates increase the cost of living, leading taxpayers to evade taxes to manage their expenses. Qamar et al. (2021) found that inflation has a significant impact on tax evasion. In the same vein, Li et al. (2021) demonstrated that inflation increases the perceived burden of taxes and reduces taxpayers' willingness to pay taxes, leading to an increase in tax evasion. Inflation increases the perceived burden of taxes and reduces taxpayers' willingness to pay taxes, thereby contributing to an increase in tax evasion, as Ozili (2020) argued. Inflation positively affects tax evasion, and the negative relationship between inflation and tax compliance is stronger for small businesses than for large ones in China (Li et al., 2020). A study carried out by Singhal et al. (2022) in India found that inflation has a significant positive relationship with tax evasion. Kuo (2022) found that inflation and tax evasion in Taiwan have a nonlinear relationship. The authors found that tax evasion initially increases with inflation. Correspondingly, the following hypothesis was proposed:

**H2.** There is a positive relationship between inflation and perceived tax evasion in ASEAN countries.

## **Corruption**

Corruption refers to the misuse of power, privilege, and position for personal gain. It is believed that perceived corruption can encourage tax avoidance, foster distrust in governments, and drive taxpayers to behave opportunistically. As a result, corruption is perceived to create inefficient tax systems, which reduce taxpayers' willingness to pay taxes (Damayanti et al., 2020). The connection between corruption and tax evasion has long been established and is considered a significant threat to the global economy (Alm et al., 2016). Corrupt practices can reduce tax revenue generation efficiency as taxpayers can easily evade taxes by bribing tax administrators (Alkhatib et al., 2019). Previous studies such as Sabaruddin (2021) and Obaid and Udin (2020) indicated a positive relationship between corruption and tax evasion, while Augustine and Enyi (2020) have asserted that controlling corruption weakens tax evasion. Alon and Hageman (2013) found that corruption negatively influences tax compliance, whereas few studies did not find a significant link between corruption and tax evasion (Imam and Jacobs, 2014; Alkhatib et al., 2019). Akdede (2006) even found that corruption could be positively associated with voluntary tax compliance. Considering the literature presented above, the following hypothesis was examined:

**H3.** There is a positive relationship between corruption and perceived tax evasion in ASEAN countries.

## **METHODOLOGY**

The main objective of this study is to investigate the effects of Inflation, GDP annual growth, corruption, and perceived tax evasion among ASEAN countries. The study adopts a Cross-sectional time-series FGLS regression where the data is collected from 10 ASEAN countries.. The study includes one dependent variable and two explanatory variables based on the model. Thus, Perceived Tax Evasion is the dependent variable in this study, which is quantified using tax as a percentage of the GDP of all the selected countries derived from 2011 to 2020, which is supported by (Tosun & Abizadeh, 2005; OECD, 2023). According to OECD any country whose tax as a percentage of GDP is below the average of the region there is an element of tax evasion in that country. While Inflation, and GDP Annual Growth are the explanatory variables of the study where inflation is measured as a percentage of the consumer price index of each country (Clements, & Izan, 1987; World bank database, 2023), GDP Annual Growth is measured as annual percentage growth rate of GDP at market prices based on constant local currency of each country (World bank, 2023).

## Model Specification

In general, the Panel regression model could be specified using multiple regression analysis procedure as stated below, thus:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \beta_n X_{nit} + \varepsilon_{it} \dots \dots \dots (1)$$

$Y_{it}$  = Dependent variable for a country I for time t  
 $X_i$  = Explanatory Variable for a country I for time t  
 $\beta_0$  = Constant  
 $\beta_{1-n}$  = Coefficient of  $X_{1-n}$   
 $\varepsilon_i$  = Error term

Based on the process above, therefore, the model of the study will be:

$$PTE_{it} = \beta_0 + \beta_1 GDPAG_{it} + \beta_2 INF_{it} + \beta_3 C_{it} + \varepsilon_{it}$$

Where:

PTE = Perceived Tax Evasion  
 INFL = Inflation  
 GDPAG = GDP Annual Growth  
 C = Corruption  
 $\varepsilon_i$  = Error term  
 $\beta_0$  = Constant  
 $\beta_1$ -  $\beta_3$  = Coefficient of the Independent Variables  
 it = Panel Data indicator.

## RESULTS

### Diagnostics Tests

#### 1- Heteroskedasticity

The heteroscedasticity problem is usually tested by Breusch-Pagan / Cook-Weisberg test. according to (Gujarati & Porter, 2009), the heteroscedasticity issue is presented if the p-value is significant (less than 0.05). However, the problem is to be absent if more than 0.05 (insignificant). the result of test shows that the value of Breusch-Pagan / Cook-Weisberg test is insignificant at 0.2136. Thus, the null hypothesis is accepted, suggesting the data is free from heteroscedasticity problem.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

$$\begin{aligned} \text{chi2}(3) &= 4.49 \\ \text{Prob} > \text{chi2} &= 0.2136 \end{aligned}$$

#### 2- Autocorrelation

As a rule of thumb, d-statistic value (regression results of Durbin-Watson test) should be between **1.5 and 2.5** to indicate independence of observations (Hutcheson & Sofroniou, 1999).

Durbin-Watson d-statistic( 4, 100) = 0.4371281

The result of the test showed that the DW value (**0.4371281**) is out of the acceptable range values (1.5 to 2.5), thus, the null hypothesis is rejected, and the autocorrelation issue exists.

### Regression Analysis

#### 1) Descriptive Statistics

variable	Obs	mean	median	min	max	Std. Dev.
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PerceivedT~n	100	0.9198	1.08	-6.46	8.7	3.648718
Inflation	100	3.239	2.9	-1.1	18.7	2.922255
Corruption	100	90.93	97	3	180	45.78038
GDPAnnualG~h	100	4.5978	5.55	-9.5	11.1	3.645808

From Table 1, the study reported the mean of perceived tax evasion is 0.9198 (92%). The average inflation rate is 3.239. As shown in the table, the mean of corruption in Asian country is 90.93. Finally, the annual growth in GDP reported at 4.5978 on average.

**Multicollinearity**

**2) Pairwise correlations (Pearson correlation)**

Variables	(1)	(2)	(3)	(4)
(1) PerceivedTaxEv~n	1.000			
(2) Inflation	0.171* (0.090)	1.000		
(3) Corruption	0.271*** (0.006)	0.241** (0.016)	1.000	
(4) GDPAnnualGrowth	-0.066 (0.512)	0.253*** (0.011)	0.271*** (0.006)	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 2 presents Pearson correlation and shows positive relation between inflation and corruption with perceived tax evasion at significance level 10% and 1%, respectively. There is a significant positive relationship between corruption and inflation at 5 percent, while at one percent between GDPAnnualGrowth and inflation as well as between GDPAnnualGrowth and Corruption. however, there is no association between GDPAnnualGrowth with PerceivedTaxEvasion. in conclusion, the multicollinearity is absent because the Pearson coefficient is not exceeded 0.70 (70%), as illustrated by Hair et al. (2017). Furthermore, VIF, in table 3, indicates that there is no multicollinearity problem because its value is less than 10.

**3) VIF**

Variable	VIF	1/VIF
GDPAnnualG~h	1.12	0.889127
Corruption	1.12	0.894830
Inflation	1.11	0.903569
Mean VIF	1.12	

**FGLS****4) Cross-sectional time-series FGLS regression**

PerceivedTaxEvasion	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig	
Inflation	.229	.07	3.27	.001	.092 .368	***	
Corruption	.007	.01	0.72	.470	-.012 .026		
GDPAnnualGrowth	-.043	.04	-1.05	.293	-.122 .037		
Constant	-.089	.989	-0.09	.929	-2.027 1.85		
Mean dependent var	0.920		SD dependent var		3.649		
Number of obs	100		Chi-square		12.500		
Prob > chi2	0.0059						

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

The results (FGLS regression table) indicates that model fit at significant one percent (Prob > chi2 = 0.0059).

Hypothesis H1. Postulate a negative relationship between GDP annual growth with perceived tax evasion. From the table 4.0 above, the coefficient is -.043 which indicate a negative relationship was established between the two contrsucts, hence, the hypothesis is supported, but not significantly, since the t value is -1.05. The result implied that an increase in GDP annually would decrease the level of tax evasion among ASEAN taxpayers.

Hypothesis H2. Postulates a positive relationship between inflation and perceived tax evasion, the coefficient is .229 and the p-value is .001 implied that the relationship is positive and significant. The result implied that a unit increase in inflation would correspondingly increase tax evasion among ASEAN taxpayers. The finding is concomitant with previos studies (Cobham, 2005; Fuest, & Riedel, 2009).

Hypothesis H3, postulate a posive relationship between corruption and perceived tax evasion. Result from table 4 shows a coefficient of .007 and p-value of .470, which signifies that the the relationship is positive, but not significant, hence, the hypothesis is supported. The result implied that a unit increase in corruption would increase tax evasion by one unit among ASEAN taxpayer, but not significantly. The finding of this study is supported by the previous research (Cerqueti & Coppier, 2011; Alm, Martinez-Vazquez & McClellan, 2016; Amoh & Ali-Nakyea, 2019).

**CONCLUTIONS AND POLICY IMPLICATIONS**

This study invistagate the effects of some macroeconomic variables such as inflation and GDP annual growth, corruption on perceive tax evasion among ten ASEAN countries. The findings indicate that inflation, and corruption have positive relationship with perceived tax evasion. While GDP annual growth has negative and insignificant impact on perceived tax evasion among ASEAN countries. The finding implied that an increases in inflation by one measurement would increase tax evasion among the taxpayers in ASEAN countries by the same measures. Additionally, the finding further shows that an increase in one measurement of corruption level would increase tax evasion by the same measures. The finding on the GDP annual growth that the higher the GDP annual growth the less taxpayers commit tax evasion in ASEAN countries. The outcomes of this finding provide novel knowledge that is currently lacking in the existing literature, invariably it shows that ASEAN countries corruption level is less significant, and cannot affect their economic growth. Policymakers are encouraged to provide sound robust economic policies to improve economic growth and development among ASEAN countries.

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# THE DYNAMIC RELATIONSHIP BETWEEN HEALTHCARE EXPENSES, ECONOMIC GROWTH AND OTHER SELECTED MACROECONOMICS

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## ABSTRACT

*This study aims to identify the long term relationship between healthcare expenses and selected macroeconomics variables, in Malaysia. This study uses the time series data that were gathered from 1990 to 2022. According to previous studies, there is a positive relationship between healthcare expenses and GDP, population, and life expectancy. Therefore, in order to explore the long term relationship between the variables, this study adopted the Johansen Juselius Analysis. The study expend further by exploring the granger causality in the vector error correction framework. The results suggested that, there is at least one co-integrating vector in the system equation exist in the long term., it can be concluded that all the variables studied in this study have an impact on healthcare expenses in Malaysia. Thus, the government or any other related statutory body must take appropriate action when the crisis strikes.*

**Keywords:** *Gross Domestic; Health Care Expenses; Population; Life Expectancy; Johansen Juselius Co-integration*

## ABSTRAK

*Kajian ini bertujuan untuk mengenal pasti hubungan jangka panjang antara perbelanjaan kesihatan dan pemboleh ubah makroekonomi terpilih di Malaysia. Kajian ini menggunakan data siri masa yang dikumpulkan dari tahun 1990 hingga 2022. Menurut kajian terdahulu, terdapat hubungan positif antara perbelanjaan kesihatan dan KDNK, populasi, dan jangka hayat. Oleh itu, bagi mengkaji hubungan jangka panjang antara pemboleh ubah - pemboleh ubah tersebut, kajian ini menggunakan Analisis Johansen Juselius. Kajian ini dilanjutkan dengan meneroka kausaliti granger dalam rangka kerjasama pembaikan ralat vektor. Hasil kajian menunjukkan bahawa terdapat sekurang-kurangnya satu vektor kointegrasi dalam persamaan sistem yang wujud dalam jangka panjang. Oleh itu, dapat disimpulkan bahawa semua pemboleh ubah yang dikaji dalam kajian ini mempengaruhi perbelanjaan kesihatan di Malaysia. Justeru, kerajaan atau mana-mana badan berkanun yang berkaitan harus mengambil tindakan yang sesuai apabila berlakunya krisis.*

*Kata kunci: Keluaran Dalam Negeri Kasar; Perbelanjaan Kesihatan; Populasi; Jangka Hayat; Ko-integrasi Johansen Juselius.*

## INTRODUCTION

In general, government expenditure, which includes a variety of sectors, is a significant factor in determining the identity of the fiscal budget and national income accounting. In this context, the health care sector is one of the sectors where the government makes expenditures. Therefore, government expenditure on health care is indirectly related to Gross Domestic Product (GDP). With that, the government also cares about the health sector and has contributed spending in the health care sector. In this context, Gross Domestic Products (GDP) is one of the components in National Accounting, has been widely used around the world as a benchmark for measuring the size and economic growth rate of a country or region. Gross domestic product (GDP) is the value of goods and services produced by all production factors in a country, whether the production factors used belong to that country or foreign countries. Hence, such aspects like need to be emphasized in order for economic growth in line with the growth of the world economy. This is because Malaysians are more towards the increasingly demanding globalization era. The community expertise in various angles needs to be continuously upgraded so that the state of the economy continues to grow from an economic point of view, or other angles (Hashim, A. 2022).

## LITERATURE REVIEW

In this section, there will be in-depth discussion relating to the relationship between dependent variables and independent variables.

### *The Relationship between Health Care Expenses and Population*

Based on the comparative study of China and India by Nur Haiza Nordin, et al (2015), the aging population has a relationship with healthcare expenditure. According to the authors research, the aging population shows relatively higher expense for healthcare, especially for older-aged citizens in both countries, China, and India. Besides, this is further supported by other research about the determinants of health care expenditure done by Fumitaka Furuoka, et all (2011). Based on the study, it is found that there are only two independent variables, which are gross domestic product and population that have a significant relationship with health care expenditure in 12 Asian countries studied, including Malaysia. This means that, when the total population is increasing or becomes higher, the amount of health care expenditure will also be increased.

Furthermore, according to a study by Roziana B. and Suhaila S., 2018, in their study of the aging population does affect healthcare expenditure. This is because the result of their research shows that health expenditure is increasing accordingly with the increase of the aging population. This is said so because the advancement of medical technology that benefited the elderly more than the young has led to the growth of a population's lifespan. There is also another research by Habib Nawaz Khan (2016) about Modeling Determinants of Health Expenditure in Malaysia: Evidence from Time Series Analysis conclude that the population growth and structure have a negative impact on Malaysia's health care expenses. Besides, according to the research made by Tat Yean Tham *et.all* 2018, appropriate interventions must be made so that policy reforms can be implemented immediately. This is to protect the health of the aging population. Through this conclusion, it can be understood that health expenditure has a positive relationship with the population in a country. Lastly, based on the study by Subhalaxmi M. (2022), the government plays an important role in increasing health expenditures and infrastructure to create better health outcomes. The author said that the government should investigate the causes behind the high out-of-pocket expenditures and take appropriate measures to solve this problem. Thus, based on all of the studies that have been reviewed,

it can be concluded that health care expenses have a positive relationship with the population, especially the aging population.

### ***The Relationship between Health Care Expenses and Life Expectancy***

There are several studies that do research about the relationship between health care expenditure and life expectancy. One of the research projects is the study that has been done by Alhassan B. and Ibrahim M. (2022), which is this study investigating the impact of total health expenditure on life expectancy. Based on this study, they found that there is a positive significant influence on life expectancy, and they argue that the larger health expenditure will aid in improving the life expectancy rate. Moreover, the result in this study shows that spending on healthcare increases citizens' life expectancy in African countries. That is, increased health spending increases average life expectancy, while lower health spending decreases average life expectancy. One possible reason for this finding is that African health authorities are wisely allocating funding to the health sector for the provision of healthcare services and related activities targeted at improving the lives of people in their countries. Based on this article, this study used a panel of 43 African countries and spanned over the period 2000 until 2018 and was applying the system GGM technique to get the results. The dependent variable is Life Expectancy at birth (LE) and the main independent variable is the Total of Health Expenditure (THE).

Moreover, the other study that do research about the relationship between health care expenditure and life expectancy is the study that has been done by Guivis Z. N., Honoré O.T. and Alim B. (2021), which is the study was investigate and compare the impact of public and private health spending on life expectancy or the relationship between the health care expenditure and life expectancy. The study used the annual time series data over the period from 1980 until 2014 in Cameroon. In this study, the OLS model was used to assess the effect of public and private health spending on life expectancy, while the Toda and Yamamoto causality test was employed to investigate the relationship between public and private health spending and life expectancy in Cameroon. Based on this article, they found that in Cameroon, the Life expectancy at birth (LE) and health expenditure (HEX), which includes both public and private health spending, are considered to have a positive relationship. This is because health spending is meant to lower mortality rates by improving the population's health. Preventive and curative health expenditures directly reduce disease burden by lowering the number of years of life lost (YLL) due to early mortality and the number of years of life lived with disease (YLD). To be sure, this should have the effect of extending life and increasing life expectancy.

### ***The Relationship between Health Care Expenses and Gross Domestic Product***

Ali H., Norazlina (2019) had conducted research by using the econometric models to determine health care expenditure in developing countries. They have collected series data from 1980 to 2017. To examine the unit root, they used the Augmented Dickey-Fuller test while OLS regression to identify the types of relationships between health expenditure and its determinants. In addition, Johansen Cointegration is also used to study long-term cointegration relationships and the Granger Causality test is used to study cause-and-effect relationships. The result of the study shows that gross domestic product have short and long-term relationships with health expenditure.

In addition, a study examining the relationship between healthcare expenditure and GDP was conducted by Abegaz, K.H., Mohammed A.A.(2018). They used the period from 1995 to 2014 as their data collection. They used Augmented Dickey–Fuller and Johansen cointegration tests have used to carry out their output. Besides, they also used ordinary least squares, least absolute deviations, least mean squares, and M-estimator estimation approach to test the elasticity of healthcare expenditure. The results show that there was a significant relationship between GDP and healthcare expenditure.

## METHODOLOGY

### Model specification

The model used in this study is based on the Keynesian model. The model is inspired by a study conducted by Rambeli N. & Hashim. E. (2017) that was done with the aim to identify the effect of macroeconomic variables on healthcare product expenditure patterns in Malaysia. The general specification model used for this study is as follows:

$$HCE_t = \beta_0 + \beta_1 HCE_{tppc} + \beta_2 GDP_{tppc} + \beta_3 POP_t^{65} + \beta_4 LE + \mu_t \tag{1}$$

According to equation (1), HCE<sub>t</sub> is the dependent variable that represents the health care expenditure for the year. Meanwhile, HCE<sub>tppc</sub> and GDP<sub>tppc</sub> stands for health care expenses per capita and gross domestic product per capita for the year, respectively. Next, POP<sub>t</sub> represents the aging population for person 65 years old and above for the year and LE<sub>t</sub> represents life expectancy.

This study also using a few methods of analysis such as Correlogram, Augmented Dickey Fuller (ADF) of Unit Root Tests, Granger Causality Test, Johansen Juselius Cointegration Test, Vector Autoregression (VAR), Error Correction Term (ECT), Vector Error Correction Model (VECM), and Wald Test in VECM. This analysis was conducted to observe the data’s randomness, to determine whether the data should be first difference or regressed on deterministic time to make it stationary. Besides, the analysis also conducted to know what variable that “granger-cause” the other variables, to test the cointegrating relationship between the data, and so on.

## EMPIRICAL FINDINGS

This part in this study will present the result of the analysis that has been made using methods that were already mentioned in the previous section.

### Augmented Dickey Fuller Unit Root

Table 1, shows the result of ADF unit root tests at level and first different, by taking into consideration with none intercept, with time trend and without time trend. If the augmented value is greater than critical value so it is stationary, but if the augmented value is less than critical value, it is not stationary. Data series is a I(1) data if non-stationary at level form and stationary at first difference.

**TABLE 1:** Augmented Dickey Fuller (ADF) of Unit Root Test

Data series	At level			At first difference		
	Without constant	With constant	With constant and time frame	Without constant	With constant	With constant and time frame
<b>HCE</b>	1.389020[9] (0.9541)	-1.896066 [14] (0.3264)	-0.836806 [14] (0.9419)	-3.059828* [13] (0.0043)	-3.967602* [0] (0.0047)	-3.884228* [0] (0.0250)
<b>HCE pc</b>	-0.814604 [14] (0.3490)	-2.307936 [12] (0.1791)	-1.209965 [14] (0.8770)	-2.507206* [13] (0.0155)	-6.730215* [0] (0.0000)	-3.458994** [11] (0.0717)

<b>GDP</b>	1.302719 [12] (0.9455)	-1.801285 [14] (0.3679)	-2.583882 [11] (0.2899)	-4.470304* [0] (0.0001)	-3.109113* [13] (0.0439)	-4.029992* [13] (0.0272)
<b>POP</b>	-1.689117 [1] (0.0858)	-0.811686 [8] (0.7976)	3.0057371 [11] (1.0000)	-2.021105* [0] (0.0431)	8.973591* [14] (1.0000)	-3.907469* [2] (0.0247)
<b>LE</b>	-0.943328 [1] (0.3005)	-2.533440 [13] (0.1237)	1.725149 [6] (1.0000)	-4.814083* [14] (0.0001)	2.669216** [11] (0.9999)	-14.07716* [13] (0.0001)

Noted: Numbers in [] are numbers of lag that follow Akaike Info Criterion (AIC). Numbers in () are numbers of probability. The sign \* indicates the significant level at 5% and 1% and \*\* indicates the significant level at 10%.

In this study we reject the null hypothesis at the 10% level. According to the ADF, the unit root test result shows that HCE is not stationary at level form and stationary at first difference without a constant. Here, we can conclude that HCE is a I(1) data without a constant. The HCEpc result shows that not stationary at level form and stationary at first difference without a constant and with constant and time frame. Thus, HCEpc is I(1) data without a constant and with constant and time frame. Next, GDP results show that not stationary at level form and stationary at first difference with a constant and with constant and time frame at level for 5% significant level. Hence, GDP is I(1) data with a constant and with constant and time frame. The POP result shows that POP is not stationary at level form and stationary at first difference with a constant and with constant and time frame. Thus, POP is I(1) data with a constant and with constant and time frame. Lastly, we observe that LE is not stationary at level form and stationary at first difference. Hence, LE is I(1) data with three ADF specifications. Overall, this result indicates that all series data are non-stationary at their level form and stationary at first difference with difference ADF specifications.

### *Johansen Juselius Co-integration Tests*

**TABLE 2:** Johansen Juselius Cointegration result

Hypothesis (H0)	Co-integration System						
	Lag 3	$\lambda$ Trace	5% Critical Value	1% Critical Value	$\lambda$ Max	5% Critical Value	1% Critical Value
None**		203.8614*(**)	68.52	76.07	81.19112*(**)	33.46	38.77
At most 1**		122.6703*(**)	47.21	54.46	66.12295*(**)	27.07	32.24
At most 2**		56.54730*(**)	29.68	35.65	38.42414*(**)	20.97	25.52
At most 3*		18.12315*	15.41	20.04	18.10231*	14.07	18.63

Table 2 shows the Johansen Juselius Cointegration test that was done to know the cointegrating relationship between several non-stationary time series data. Based on the result of the test above, it can be concluded that there are two cointegrating vector at none in the system equation in the long run at 99% significant level, in which the  $\lambda$  trace is greater than the critical value, which is  $203.8614 > \alpha$  (5%): 68.52, and  $\alpha$  (1%): 76.07. The  $\lambda$  max. eigenvalues also have cointegrating vectors in the long run where the  $\lambda$  Max is seen to be greater than the 5% critical value ( $81.19112 > 33.46$ ), and 1% critical value ( $81.19112 > 38.77$ ). So, in this case, the null-hypothesis will be rejected.

Hypothesis 1 and 2 also recorded that they have two cointegrating vectors in the system equation in the long run for both  $\lambda$  trace and  $\lambda$  max. Eigenvalues at 99% significance level. For hypothesis 1, it appears that  $\lambda$  trace and  $\lambda$  max. Eigenvalues  $> \alpha$ , 5% and 1%, which is,  $122.6703 >$

47.21, and 54.46, and 66.12295 > 27.07, and 32.24, respectively. It is also the same with hypothesis 2 where the  $\lambda$  trace (56.54730) is bigger than 5% critical value (29.68), and 1% critical value (35.65). Then the  $\lambda$  max. Eigenvalues (38.42414) are also bigger than the 5% critical value (20.97), and 1% critical value (25.52). In this case too, the null-hypothesis will be rejected.

Lastly, the result for hypothesis 3, there is only one cointegrating vector in the system equation in the long run for both  $\lambda$ s at 99% significance level. For  $\lambda$  trace, the value of it is 18.12315, which is bigger than 5% critical value, 15.41, but smaller than 1% significance level, 20.04. Similarly, for  $\lambda$  max. Eigenvalues, the value of it is 18.10231, in which it is bigger than 5% critical value (14.07), but smaller than the 1% critical value (18.63). For this case, the null-hypothesis is rejected at 5% critical value and accepted at 1% critical value.

**Vector Autoregression (VAR)**

**TABLE 3: Vector Autoregression Tests**

Lag Length	Akaike Information Criterion (AIC)
2	-34.95738
3	-35.23050*

Table 3 above illustrates the results from vector autoregression tests (VAR). VAR tests are done to get the optimum lag length for the variables in order to reduce residual correlation. From the table above, it shows that the optimal length is 3 given in the AIC value at 35.23050, which is the lowest value among the Criterion. The minimum AIC values indicate the best lag allocation for the ECM model.

**The Development of Error Correction Term (ECT)**

In this section there will be a detail development of error correction term. The error correction term is important to measure the adjustment magnitude in the error correction model.

Error Correction term equation

$$ECT(-1) = 58.87976 + 1.000000 * LOGHCE(-1) + 0.821480 * LOGHCEpc(-1) - 0.209328 * LOGGDP(-1) - 5.787070 * LOGPOP(-1) - 9.072224 * LOGLE(-1)$$

**Wald Test in Vector Error Correction Model (VECM)**

Granger causality test will be conducted to determine the direction of causality relationships between five variables which are involved in this study. The results must be supported by the significant and negative sign of the error term variable (ECT) in both systems to know if the variable is part of the endogenous variables in the equation system.

According to table 5 and 6, the result shows that none of the variables are part of the endogenous variables in the equation system. The ECT result of HCEpc in both systems shows **significant and positive sign** (1.336196 and 1.357409). However, for variables such as GDP, POP, and LE, the ECT results show **negative sign but not significant** in both systems. According to the result, the coefficient value for GDP in uncovered regime and recovery regime is -0.364264 and -0.230402 respectively. For POP in uncovered regime and recovery regime is -0.0000938 and -0.0000973 respectively. Also, for LE in uncovered regime and recovery regime is -0.002908 and -0.002507 respectively. Table 7 summarizing the causality for regimes. In the short run, there exists an important causal link between independent variables for both regimes.

**TABLE 4:** Error Correction Term

Cointegrating Equation	CointEq1
LOGHCE(-1)	1.000000
LOGHCEPC(-1)	0.821480 (0.04081) [ 20.1291]
LOGGDP(-1)	-0.209328 (0.03242) [-6.45657]
LOGPOP(-1)	-5.787070 (0.31182) [-18.5593]
LOGLE(-1)	-9.072224 (1.54370) [-5.87695]
C	58.87976

**TABLE 5:** Wald Test in VECM before parsimonious

Endogenous Variable	Exogenous Variables					
	$\Delta HCE_t$	$\Delta HCEpc_t$	$\Delta GDP_t$	$\Delta POP_t$	$\Delta LE_t$	$ECT_{t-1}$
$\Delta HCE_t$		1.250563 [0.3386]	3.681733 [0.0468]**	1.922747 [0.1844]	2.616787 [0.1035]	0.055072 [0.6496]
$\Delta HCEpc_t$	16.77131 [0.0001]***		2.063058 [0.1634]	13.53109 [0.0005]***	0.716592 [0.5624]	1.336196 [0.0000]***
$\Delta GDP_t$	0.760519 [0.5722]	2.006399 [0.1716]		0.405960 [0.7518]	0.517997 [0.6785]	-0.364264 [0.3528]
$\Delta POP_t$	1.378014 [0.3037]	0.206428 [0.8898]	0.442284 [0.7275]		0.318544 [0.8118]	-0.0000938 [0.7174]
$\Delta LE_t$	2.849799 [0.0760]*	0.812927 [0.5130]	3.626702 [0.0486]**	3.439395 [0.0556]*		-0.002908 [0.4290]

Note: All variables in each data set are in first differences (denoted by  $\Delta$ ) with the exception of lagged error correction term ( $ECT_{t-1}$ ). All equations for all data sets passed the diagnostic test. In varies brackets, [], (), and [[]], specify for Wald-test, Wald-test probability, and error correction term coefficient. Also, that superscript '\*\*\*', '\*\*' and '\*' specify significant at 99%, 95% and 90% significant levels.

**TABLE 6:** Wald Test in VECM after parsimonious (remove probability exceed 0.5)

Endogenous Variable	Exogenous Variables					
	$\Delta HCE_t$	$\Delta HCEpc_t$	$\Delta GDP_t$	$\Delta POP_t$	$\Delta LE_t$	$ECT_{t-1}$
$\Delta HCE_t$		1.519536	6.227040	2.593666	4.588837	0.050301



		[0.2530]	[0.0116]**	[0.0939]*	[0.0293]**	[0.6432]
$\Delta HCEpc_t$	84.41154 [0.0000]***		7.517124 [0.0042]***	76.74074 [0.0000]***	2.105388 [0.1640]	1.357409 [0.0000]***
$\Delta GDP_t$	2.095875 [0.1505]	4.979575 [0.0182]**		0.707668 [0.5053]	2.059069 [0.1676]	-0.230402 [0.3597]
$\Delta POP_t$	1.935333 [0.1507]	0.064886 [0.8020]	1.540869 [0.2313]		0.311561 [0.5840]	-0.0000973 [0.6184]
$\Delta LE_t$	5.634933 [0.0095]***	1.561951 [0.2442]	5.836023 [0.0084]***	9.016881 [0.0014]***		-0.002507 [0.3562]

Note: All variables in each data set are in first differences (denoted by  $\Delta$ ) with the exception of lagged error correction term ( $ECT_{t-1}$ ). All equations for all data sets passed the diagnostic test. In varies brackets, [], (), and [[]], specify for Wald-test, Wal-test probability, and error correction term coefficient. Also, that superscript '\*\*\*', '\*\*' and '\*' specify significant at 99%, 95% and 90% significant levels.

**TABLE 7:** Summarize of overall Temporal Granger Causality test

Number of Direction	Unrecovered Regime (Direction of Causality)	Wald test	p-value
1	HCE Granger-cause HCEpc	16.77131	0.0001***
	HCEpc Granger-cause HCE	1.250563	0.3386
2	HCE Granger-cause GDP	0.760519	0.5722
	GDP Granger-cause HCE	3.681733	0.0468**
3	HCE Granger-cause POP	1.378014	0.3037
	POP Granger-cause HCE	1.922747	0.1844
4	HCE Granger-cause LE	2.849799	0.0760*
	LE Granger-cause HCE	2.616787	0.1035
Number of Direction	Recovery Regime (Direction of Causality)	Wald test	p-value
1	HCE Granger-cause HCEpc	84.41154	0.0000***
	HCEpc Granger-cause HCE	1.519536	0.2530
2	HCE Granger-cause GDP	2.095875	0.1505
	GDP Granger-cause HCE	6.227040	0.0116**
3	HCE Granger-cause POP	1.935333	0.1507

	POP Granger-cause HCE	2.593666	0.0939*
4	HCE Granger-cause LE	5.634933	0.0095***
	LE Granger-cause HCE	4.588837	0.0293**

Note: (\*\*\*), (\*\*), and (\*) indicates statistically significant at 1%, 10% and 30% level, respectively.

## CONCLUSION

The aim of this study was to determine the relationship between the health care expenses, health care expenses per capita, gross domestic product, population, life expectancy and the impact of the health care expenses to Malaysia's in the period from 1990 to 2022. The unit root properties of the data were examined and calculated by using E-Views. The study used a multiple regression equation which is estimated by the Vector Error Correction Model (VECM) method. The purpose of the study was to know the impact of healthcare expenses to gross domestic product, population, and life expectancy in Malaysia. In general, the findings of the study suggest that all the variables studied in this study have an impact on healthcare expenses in Malaysia.

Therefore, in terms of application, it can be said that to know the impact of healthcare expenses, also depends on gross domestic product, population, life expectancy. The rate of health care expenses depends on several aspects that can have a good or bad impact. Therefore, some parties need to take appropriate action. Health care expenses also depend on GDP, population, and life expectancy. For example, population plays a role in measuring the rate of health care expenses. If the population is decreasing, then the amount of health care expenses will also be decreasing and on the other hand if the population is increasing then the expenditure on health care will be increasing. Health spending in Malaysia should be increased because our results show that it improves the health status of the population. Health funds must be used appropriately and efficiently, and accountability and transparency regarding the expenditure of public health funds must be ensured. Finally, government and private institutes should implement appropriate strategies to improve health facilities in specific areas.

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# THE IMPACT OF GOVERNMENT'S HEALTH AND EDUCATION EXPENDITURES ON INSURANCE DEMAND IN MALAYSIA

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## **ABSTRACT**

*The focal aim of this paper is to examine the relationship between the government expenditure on health and government expenditure on education towards insurance demand in Malaysia. In specific, this study is conducted to examine the short run and long run impact of gross domestic product, inflation rate, government health expenditure, government education expenditure and real interest rate towards insurance demand in Malaysia. The study focuses on Malaysia, due to its major contribution in generating income through insurance demand since COVID-19 strike in 2019. This study utilized the time series data spinning from December 1990 to December 2022. This study utilised the linear ARDL approach to identify the short run and long run impact between observed variables. Specifically, this study intent to explore whether the observed variables significantly affect the insurance demand in Malaysia. This study divided onto 2 specification model, namely health model and education model. The results suggest that the health and education expenditures give significant impact on insurans demand in Malaysia. The results of the study also found that the error correction term (ECT) is significant and always has a negative value indicating the existence of a long-term relationship between explanatory variables and insurance demand.*

*Keywords: insurance demand, health expenditure, education expenditure, linear ARDL*

## **ABSTRAK**

*Fokus kertas kerja ini adalah untuk mengkaji hubungan antara perbelanjaan kerajaan untuk kesihatan dan perbelanjaan kerajaan untuk pendidikan terhadap permintaan insurans di Malaysia. Secara khusus, kajian ini dijalankan untuk mengkaji kesan jangka pendek dan jangka panjang keluaran dalam negara kasar, kadar inflasi, perbelanjaan kesihatan kerajaan, perbelanjaan pendidikan kerajaan dan kadar faedah sebenar terhadap permintaan insurans di Malaysia. Kajian ini memberi tumpuan kepada Malaysia, disebabkan sumbangan besarnya dalam menjana pendapatan melalui permintaan insurans semenjak COVID-19 melanda pada 2019. Kajian ini menggunakan data siri masa yang bermula dari Disember 1990 hingga Disember 2022. Kajian ini menggunakan kaedah ARDL linear untuk mengenal pasti kesan jangka pendek dan jangka panjang antara pembolehubah*

yang diperhatikan. Secara khusus, kajian ini bertujuan untuk meneroka sama ada pembolehubah yang diperhatikan secara signifikan mempengaruhi permintaan insurans di Malaysia. Kajian ini terbahagi kepada 2 model spesifikasi iaitu model kesihatan dan model pendidikan. Keputusan kajian mencadangkan bahawa pembolehubah perbelanjaan kesihatan dan perbelanjaan pendidikan di Malaysia memberikan impak yang penting terhadap permintaan insurans. Hasil kajian juga mendapati bahawa terma pembedahan ralat (ECT) adalah signifikan dan sentiasa mempunyai nilai negatif yang menunjukkan kewujudan hubungan jangka panjang antara pembolehubah penjelasan dengan permintaan insurans.

*Kata Kunci: permintaan insurans, perbelanjaan kesihatan, perbelanjaan pendidikan, ARDL linear.*

## INTRODUCTION

Nowaday, the role of insurance in driving the economic growth cannot be deniable. But, the role of economics performance in affecting the growth in insurance demand, in short and long term also important (Ehiogu, Onyekachi & Sunday, 2018). Many previous studies have expressed support that sustainable and stable economic growth is a driver in the increase in insurance ownership in most developing and developed countries. This issue has become increasingly interesting, since the occurrence of the health crisis after COVID-19 struck at the end of 2019. Since then, the issue of health has become very much at the top of the discussion. The increase in insurance ownership also increased. Then the demand for insurance also increased worldwide. Therefore, a study related to insurance demand needs to be studied in Malaysia.

However, according to the numerous studies, most of the reseracher focused on the relationship of insurance with age, education level, risk aversion, product nature, company reputation and service, and financial distress. This clearly, most of previous study emphasised their study from micro perspective. In addition, most of previous studies only focused on developed countries only as the country of study. In current study, the main focus is different from the previous study. This study forcus on ASEAN countries. Where, Malaysia is taken as a focus country. The main motivation is to explore the short and long run relationship between selected macroeconomics variables and insurance demand. To expend the motivation further, the estimated model is devided into two main model, namely health model and education model. The model is devided into tow main spreate model is to explore the impact of education and health on insurance demand in Malaysia. The autoregressive distributed lag (ARDL) model is utilize to achieve the objective. objectives are devide into two. The first objective is to investigate the relationship between the insurance demand (INS) and the independent variables that are gross domestic product (GDP), inflation rate (INF), government health expenditure (HEALTH), government education health expenditure (EDU) and real interest rate (RIR) in the long run. Then the second objective is to estimate the relationship between insurance demand (INS) and the independent variables that are gross domestic product (GDP), inflation rate (INF), government health expenditure (HEALTH), government education health expenditure (EDU) and real interest rate (RIR) in the short run. The results analysis is potential to help the insurance company and policy makers to make decision for insurance industry and economic welfare. Without the analysis, the interaction between variables and economic growth in both model will remain unclear, and it will be difficult to conclude regarding how the recent improvement in key regional variables will affect the macroeconomics variables.

## LITERATURE REVIEW

In depth deliberate relating to the previous literature is discussed in this section. Specifically, this section discussed numerous previous studies narrate the impact on selected macroeconomic variables namely government health expenditure, education expenditure, gross domestic product (GDP), inflation rate, interest rate. Since the 18th century, the growth of insurance has expanded worldwide. According to Çelik & Kayali (2017), since the 18th century, building insurance on solidarity, business

acumen, and the logic of calculation has proved an almost unbeatable business idea. It has been proved become a global power over the following centuries. The contribution of insurance demand in aggregate level is increasing in almost emerging countries and advanced economy level. Thus the role of insurance expenditure at country level is increasing effect from increasing in insurance demand can not be deniable plays an important favourable in economic. Among other study has proof that the increasing in insurance demand in the economic is caused by varies factors, among others Meko, Lemie, & Worku (2019), Babel (1981) and Cristea, Marcu & Cârștina (2014). These economic factors can have a positive or negative, significant or insignificant impact on insurance demand in the long and short term.

Moreover from macroeconomic level, emphasis by David (2015) the powerness of insurance industry is depende on insurance demand or protacted group. In this case, the insurance company's risk acceptance is followed by a priori analysis that involves the division of risk groups depending on the influence of factors, so that each group includes insured people with the same risk profile and pay reasonable insurance the same premium. The influence of factors is important in increasing the demand for insurance and the challenge is very high for companies that run the business especially in the old days. The significance of insurance for the economic and financial development of a country prompted to investigate the primary economic, demographic, and institutional elements that influence the development of the life and nonlife insurance sectors (Dragos & Dragos, 2013b). In this point, the relationship between the dependent variable and the independent variable that has a negative or positive relationship that can be shown by previous researchers in regard to the subject matter that is the focus of the current investigation.

#### *The Relationship between Gross Domestic Product and Insurance Demand*

Based on many studies, the gross domestic products promote insurance demand in the country positively significant. In other words, if the economic growth is stimulating the effect of an increase in gross domestic product, therefore insurance demand also increase significantly on the top of encouraging economic. Thus there are bilateral relationship between gross domestic product and the insurance demand in aggregate level. Among many study, the research proposed by Cristea et al. (2014), claimed that gross domestic product is the main component in seeing whether the growth of the insurance sector is good or otherwise. This findings furthermore supported by Yuan & Jiang (2015) where this study claimed that the development of China's insurance market is still hopeful and anticipated, the demand for insurance is more susceptible to the impact of economic, social, and political variables, as well as a number of other uncertainties, as compared to the developed insurance markets it self. Also, according to Esho, Kirievsky, Ward, & Zurbruegg (2004) a positive relationship between the insurance demand and economic growth in 44 countries in 1984–1998. Thus country Income is considered to be the most essential component among the macroeconomic factors, since it is the factor that most directly leads to increased affordability and, as a consequence, increased demand for insurance products (Browne & Kim, 1993; Hammond, Houston, & Melander, 1967; Sharku & Bajrami, 2021). among others.

#### *The Relationship between Inflation Rate and Insurance Demand*

Periods of high inflation can result in insurance companies experiencing higher claims payouts and operating costs, leading to more expensive premiums for the consumer. As a result, some customers may have to drop their coverage or switch policies to save on costs (Debrina Vita Ferezagia, 2018). Thus, it can be concluded that there is negative relationship between inflation and insurance demand in the long run. In other words, if inflation raises so the tendencies the insurance demand to reduce will happen. As discussed earlier many previous studies agreed that the gross domestic products promote insurance demand in the country positively significant. Moreover, it is also found that the inflation rate can have a negative and positive impact on insurance demand. This augment is supported by the empirical findings by Akhter & Khan (2017). Based on the study, inflation shows positive and significant impact for insurance and Takāful demand. This finding is consistant with Ehiogu et al., (2018) study, where they have found that the inflation rate had a positive but insignificant effect on insurance demand in Nigerian. Moreover, Beck & Webb (2003) use panel data

for the period of 1961-2000 to conduct their research on the factors that determine the demand for life insurance in 68 different economies. Based on the results, the inflation rate has a great impact on the volume of insurance demand which in the event of an increase in price will cause less insurance demand from the market. When coupled with restrictive rules, inflation might result in greater perceived real costs associated with life insurance. Consequently, there is a decline in the demand for life insurance during periods of inflation (Babbel, 1981). In addition, Çelik and Kayali (2017) founded during times of high inflation, there is a decline in people's desire to get life insurance.

#### *The Relationship between Government Health Expenditure and Insurance Demand*

Most of previous studies found that there is a significant relationship between government health expenditure and insurance demand. It has recently come to light that health insurance is a vital technique for easing restrictions placed on health care finance and for quickening the process of achieving universal health coverage Duku (2018). In line with that, Galárraga, Sosa-Rubí, Salinas-Rodríguez and Sesma-Vázquez (2009) added that the popular insurance system for the poor in Mexico has a protective effect on health expenditures system provided by the government, to help the poor population to get the better health services in the government hospital. Besides that, according to Zhao (2015), usually when the health shock occurs it can simultaneously increase health expenses. Increasing in health expenses is the spontaneous response due to increase in insurance demand in the country. From microeconomic perspective, rational agents would neither fully insure their uncertain health expenses nor fully annuitize their wealth because the correlation between health expenses and longevity provides a self-insurance channel for both uncertainties. From macroeconomic point of view, the impact of the government health expenditure is positive. This is because, when the government raise the allocation on health sector, in directly the probability spending in insurance demand can be also increase. But, in some other circumstances, the spending in insurance demand by the government can be reducing when the government's economic capacity has fallen (Joglekar, 2012). The catastrophic expenses on insurance are ambiguous during disaster (Knaul, Arreola-Ornelas, Méndez, & Martínez, 2005). Therefore it can be concluded here, the impact of government health expenditure on insurance demand in ambiguous across different situation. .

#### *The Relationship between Government Education Expenditure and Insurance Demand*

The word "education expenditure" refers to the funds that are allotted by the government to be spent on enhancing and enhancing the quality of education in a country. This might refer to the quality of learning, infrastructural facilities, administration and management, aid, and other such things. Based on Yun & Yusoff (2018), in line with the belief that education is able to propel any country's economic growth, the Malaysian government has extensively developed policies to enhance the education sector. A consumer's ability to make informed decisions about their insurance needs might significantly benefit from increased financial literacy on the part of the consumer. A discussion of insurance terminologies and descriptions of the characteristics of various forms of insurance can provide the consumer with the ability to choose which insurance products are suitable for his or her particular circumstance by providing this information. Therefore, if the awareness of having insurance increases, the impression of a better level of education (the result of government spending on education increases), then the demand for insurance in aggregate level will also increase (Sepehri, Sarma & Simpson, 2006). The average person will be more aware of having insurance to ensure they get the best health services.

#### *The Relationship between Real Interest Rate and Insurance Demand*

The study by Meko et al. (2019), found that real interest rate has a positive and statistically significant influence on the demand for life insurance in Ethiopia. However, the real interest rate is the factors that has the least impact on the demand for life insurance among other factors in the study. Besides that, according to Funso et al. (2018), the real interest rates determine the non-life insurance services in Nigeria. Moreover, Li, D. et al (2007) investigated the factors that influence people's decisions to purchase life insurance in OECD countries. They found that a country's level of financial

development and its insurance market's degree of competition appear to stimulate life insurance sales, whereas high inflation and real interest rates tend to decrease insurance consumption. In other words, high real interest rates tend to decrease insurance consumption. Nevertheless, Kjosevski (2012) found that the factor which is the real interest rate, the quasi-money ratio, the ratio of young liabilities, and the ratio of old liabilities all limit corruption, and government performance does not appear to be highly related to life insurance demand.

## METHODOLOGY

This study will utilise the Autoregressive Distributed Lag (ARDL) model in order to investigate the relationship between insurance demand, gross domestic product, inflation rate, government education expenditure, government health expenditure and real interest rate in short and long run. This study will also performed the Augmented Dickey-Fuller (ADF) test in term to examined the stationary level of the data series. The bound cointegration test of the variables is implement to discover bound cointegration between insurance demand and others variables in both model, namely health model and education model accordingly. Once the bound cointegration is found, then the ARDL model will executed. These entire tests are carried out by using EViews 12.

### *Data Collection*

This study was carried out with the assistance of annual data spanning the time beginning in 1990 and ending in 2022; this represents a period of 32 years for the countries of Malaysia. Data on life insurance demand, gross domestic product, inflation rate, government education expenditure, government health expenditure, and real interest rates can be obtained from a wide variety of official websites that provide accurate data, such as World Bank Data, Federal Reserve Economic Data and Macrotrend Data and other. Other websites that provide this information include. For the purposes of this investigation, INS serves as a stand-in for life insurance demand, that is the study's dependent variable in this study. While GDP is a stand-in for each country's actual gross domestic output per resident, GDP is the more accurate measure. INF is a stand-in for the inflation rate, and its value is expressed as a percentage of the current value. In addition, HEALTH and EDU are taken for the expenditures by the government on health and education care, respectively. To get the real value of INS, HEALTH and EDU, the percentage of INS, EDU and HEALTH must be multiplied by total GDP of the country. In addition, the variable data must be divided by the consumer price index (CPI) from the USD currency value to obtain the real value from the nominal value. This will allow the real value to be determined from the nominal value. As a result of this, a real and accurate quantity can be achieved. In addition to this, a standardisation of the data will be acquired for each country in the form of currency values represented in USD. Since the data have been deflated by the CPI, all of the variables have been converted into logarithmic in order to make the analysis more accurate and comprehensive.

**TABLE 1:** Data Resources for Malaysia and Singapore

<b>Data Full Name</b>	<b>Short Form in Data Modelling</b>	<b>Source of Data</b>	<b>Link</b>
Insurance demand (volume)	INS	FRED	<a href="https://fred.stlouisfed.org/series/DDDI09MYA156NWDB">https://fred.stlouisfed.org/series/DDDI09MYA156NWDB</a>
Gross Domestic Product (GDP)	GDP	World Bank	<a href="https://data.worldbank.org/indicator/NY.GDP.PCAP.KN?locations=SG">https://data.worldbank.org/indicator/NY.GDP.PCAP.KN?locations=SG</a>
Inflation Rate	INF	Macrotrend	<a href="https://www.macrotrends.net/countries/MYS/malaysia/inflation-rate-cpi">https://www.macrotrends.net/countries/MYS/malaysia/inflation-rate-cpi</a>
Government Health Expenditure	HEALTH	World Bank	<a href="https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS">https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS</a>



(% of GDP)			
Government Education Expenditure (% of GDP)	EDU	World Bank	<a href="https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS">https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS</a>
Real Interest Rate	RIR	World Bank	<a href="https://data.worldbank.org/indicator/FR.INR.RINR?end=2021&amp;start=1970">https://data.worldbank.org/indicator/FR.INR.RINR?end=2021&amp;start=1970</a>

*Model Specifications*

The objective on this study is to observe the impact of selected macroeconomic data series towards insurance demand using data collected from three countries namely Malaysia for thirty two years starting from 1990 to 2022. This study is inspired by Baruti (2022). But, the current study is expended further by dividing the estimation model into two different model namely the Government Health Model (HEALTH) and Government Education Model (EDU). Hence the model specification are as follows:

*Government Health Model*

$$MINS_t = \beta_0 + \beta_1MGDP_t + \beta_2MINF_t + \beta_3MHEALTH_t + \beta_4MRIR_t + \varepsilon_t \quad (1)$$

*Government Education Model*

$$MINS_t = \gamma_0 + \gamma_1MGDP_t + \gamma_2MINF_t + \gamma_3MEDU_t + \gamma_4MRIR_t + \varepsilon_{t3} \quad (2)$$

*Augmented Dickey-Fuller Unit Root Test*

A unit root (also known as a unit root process or a difference stationary process) is a stochastic trend in a time series that is frequently referred to as a "random process with drift"; if a time series contains a unit root, it demonstrates an unanticipated systematic pattern. The unit root test is a well-known formal test that can be used to determine whether or not time series data is stationary. The unit root test is playing an essential part in determining the degree to which each variable is integrated. Other tests, such as the Augmented Dickey Fuller test developed by Dickey and Fuller (1976) and the PP test developed by Philips and Perron, are also important in this regard (1988). In spite of this, the performance of the ADF Test is higher than that of the PP Test. Davidson and MacKinnon (2004). To determine the unit root test, the following hypothesis is used:

**$H_0 : \delta = 0$**  Null hypothesis (Failed to reject  **$H_0$** , series in non-stationary)

**$H_1 : \delta = 0$**  Alternative hypothesis (Reject  **$H_0$** , series is stationary)

According to the ADF Test, if a set of data fails to reject the null hypothesis ( $\delta = 0$ ;  $H_0$ ) at the first difference I(1) with an ADF t-statistic value that is smaller than 5% significant of t-critical, then the first difference of the variables has a unit root but is non-stationary. This occurs when the null hypothesis is not rejected at the first difference I(1). In addition, there was a non-stationary state present when the probability was equal to 1.

Empirically, the construction of ADF test is based on three equations:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-1} + \varepsilon_t \quad (5)$$

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-1} + \varepsilon_t \quad (6)$$

$$\Delta Y_t = \alpha_0 + \alpha_2 + \delta Y_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-1} + \varepsilon_t \quad (7)$$

From the equation, the symbol indicated as,

$\Delta Y_t$	= First differential level ( $Y_t - Y_{t-1}$ )
$\delta$	= $p - 1$
$p$	= $1 - d/2$
$d$	= Statistical value of Durbin Watson
$\alpha$	= Deterministic elements
$t$	= Time
$\varepsilon$	= White noise term

A random walk is represented by the equation (5), a random walk with an intercept is represented by the equation (6), and a random walk with an intercept and a temporal trend is represented by the equation (7). (Gujarati, 2003). With regard to the equation,  $Y_t$  stood for the level form, whereas  $\Delta Y_t$  stood for the first difference. In addition, the data set is considered to be covariance stationary if the mean does not change in value and remains comparable to the variance ( $\sigma^2$ ) regardless of the changes in time origin (Enders, 1995). The following are the values for the mean, variance, and covariance:

$$E(X_t) = \mu \quad (8)$$

$$\text{Var}(X_t) = E(X_t - \mu)^2 = \sigma^2 \quad (9)$$

$$E(X_t - \mu)(X_{t-k} - \mu) = \gamma_k \quad (10)$$

### *Bound Cointegration Test*

The next step in the analysis is to do a test to determine whether or not the exogenous variables and the endogenous variables are cointegrated. This step comes after the determination of the optimal lag. The term "cointegration" refers to a concept that imitates the existence of a long-term link between the variables. In general, this definition describes cointegration. When it is not clear whether the data generating process underlying a time series is trend or first difference stationary, bound testing, which is an extension of ARDL modelling, employs F-statistics and t-statistics to test the significance of the lagged levels of the variables in a univariate equilibrium correction system. This is done when it is the case that the correction system is a univariate equilibrium. Thus, the following hypothesis is performed:

$$H_0 : \mu_1 = \mu_2 = 0: \text{A long run relationship does not exist} \quad (11)$$

$$H_1 : \mu_1 \neq 0 \cup \mu_2 \neq 0: \text{A long run relationship exist} \quad (12)$$

### *ARDL Long Run Model*

After estimating the level of integration of the variables, the next step is to find the long run dynamic relationship among the variables of dependent and independents. Whereas if purpose of the F-Bound test is to determine whether or not a long-term relationship exists between the variables, the purpose of this step is to determine the long-term coefficient estimation in order to justify the significance of the variables. Additionally, this step will determine whether the exogenous variable known as insurance demand (INS) has a positive or negative relationship with the endogenous variables known as gross domestic product (GDP), inflation rate (INF), government health expenditure (HEALTH), government education expenditure (EDU) and real interest rate (RIR) in Malaysia and Singapore.

### *ARDL Short Run Model*

Through a straightforward linear transformation, an error correction model (ECM) can be generated from ARDL. Similarly, the ECM integrates the short-run dynamics with the long-run equilibrium without sacrificing long-run information and avoids issues such as false relationships caused by non-stationary time series data. Besides that, the cointegration exists between the variables, the next step is estimating the equation via ARDL technique by choosing the order of the model using the Akaike Information Criteria (AIC) to achieve the short and the long run dynamic parameters and Error correction term. In addition, cointegration between the variables exists. The next step involves estimating the equation using the ARDL technique while selecting the model's order using the Akaike

Information Criteria (AIC) in order to obtain the short- and long-term dynamic parameters as well as the error correction term.

## RESULTS AND DISCUSSION

As a mention before in the methodology, on this research study is using Autoregressive Distributed Lag (ARDL) to investigate and comparison the long run and short run relationship to determine the insurance demand (INS), gross domestic product (GDP), inflation rate (INF), government health expenditure (HEALTH), government education expenditure (EDU) and real interest rate (RIR) in Malaysia and Singapore. Unit root test also known as a formal test for stationary determination in the time series variables by Augmented Dickey-Fuller (ADF). On the other hands, moving on to the implementation of F-Bound test cointegration test to identify the long run association in the time series variables. Once the cointegration association is presented, the following test shall be run which are ARDL long run coefficient estimation, Error Correction Model (ECM) Regression for short run.

### Unit Root Test

**TABLE 2** Augmented Dickey-Fuller (ADF) of Unit Root Test for Malaysia

Variables	At level			At first difference		
	Pure (none)	Without trend (intercept)	With trend and intercept	Pure (none)	Without trend (intercept)	With trend and intercept
<b>Insurance Demand (INS)</b>	1.709507 [2] (0.9759)	-2.082150 [2] (0.2528)	-1.130780 [2] (0.9053)	-3.492266 [0] (0.0011)***	-4.139654 [0] (0.0032)***	-4.730167 [0] (0.0037)***
<b>GDP (GDP)</b>	4.528242 [7] ( 1.0000)	1.012176 [7] ( 0.9952)	-2.150498 [7] ( 0.4927)	-3.136964 [0] ( 0.0028)***	-4.318791 [0] ( 0.0021)***	-4.511988 [0] (0.0062)***
<b>Inflation Rate (INF)</b>	-1.376720 [2] (0.1528)	-0.954190 [7] ( 0.7516)	-1.764422 [7] ( 0.6886)	-6.113741 [1] ( 0.0000)***	-6.249193 [1] (0.0000)***	-6.176022 [1] (0.0001)***
<b>Government Health Expenditure (HEALTH)</b>	2.481284 [2] ( 0.9956)	-2.130344 [3] ( 0.2350)	-1.365728 [3] ( 0.8480)	-2.904311 [0] ( 0.0052)***	-3.982706 [1] ( 0.0049)***	-5.027430 [1] ( 0.0019)***
<b>Government Education Expenditure (EDU)</b>	0.700360 [7] ( 0.8596)	-1.448269 [7] ( 0.5410)	-1.791955 [1] (0.6825)	-3.953825 [0] (0.0003)***	-4.065109 [0] (0.0039)***	-4.399663 [0] ( 0.0081)***
<b>Real Interest Rate (RIR)</b>	-0.322737 [7] ( 0.5580)	-1.700588 [7] ( 0.4177)	-0.961849 [7] ( 0.9302)	-9.331983 [1] ( 0.0000)***	-9.154184 [1] ( 0.0000)***	-9.252952 [1] ( 0.0000)***

(Source: Calculated by using EViews 10 Software)

Note: The value in [ ] is the number of lag lengths that follow Akaike's Information Criterion (AIC). The value between brackets ( ) is the p-value from Mackinnon (1996). In addition, the \*\* and \*\*\* represent the level of significance at 10%, 5% and 1%, respectively.

Table 2 displayed the results of the ADF test in Malaysia, including the level form and the first difference. The p-value significance level is determined from MacKinnon (1996) to analyse the probability of the series accepting or rejecting the null hypothesis. The results showed that the insurance demand (INS), gross domestic product (GDP), Inflation Rate (INF), Government Health

Expenditure (HEALTH), Government Education Expenditure (EDU) and Real Interest Rate (RIR) are non-stationary at the level form that accepted the null hypothesis of the unit root test because the t-statistic of each variable is greater than the critical value. For instance, in time series data of INS for Malaysia shows the value of ADF test statistic at the level form is greater than the critical value, which is for none is 1.709507 is greater than -2.650145, -1.953381 and -1.609798 at lag length 2. For without trend (intercept) at level form shows INS value of -2.082150 is greater than -3.689194 of critical value at 1% significant level. While for with trend and intercept, INS value is -1.130780 better than critical value of -4.323979 at lag length 2.

In the meantime, at the first difference in each, the null hypothesis was successfully rejected, and the statistical significance was estimated to be 95% and 99%. For instance, at the first difference probability value of the INS data series for none, without trend (intercept), and with trend and intercept are all significant at 99% under homogeneous lag length 1 and 0, respectively. Also, the first difference in Malaysia is -3.492266 which is smaller than the critical value which is -2.647120 at none. At without trend, the t-statistic value is -4.139654 while the critical value is -3.679322 at the 1% significance level. Furthermore, for the trend and intercept, the ADF t-statistic value equal to -4.730167 is smaller than the critical value, -4.309824, -3.574244 and -3.221728 which are respectively at the significant level of 1%, 5% and 10%. What can be concluded that the time series data in the first difference is stationary data. For example, on variable time series data with trend and intercept for the gross domestic product (GDP), inflation rate (INF), government health expenditure (HEALTH), government education expenditure (EDU) and real interest rate (RIR) on the with trend and intercept respectively show smaller t-statistic values compared to critical values. Which each value is -4.730167(GDPCC), -6.176022 (INF), -5.027430 (HEALTH), -4.399663(EDU) and -9.252952 (RIR) is lower than the 1% significant level which is -4.32397.

#### *Bound Cointegration Test Results*

In this section there will brief discussion regarding the bound cointegration test for Malaysia. This test is conducted for two main model under observation namely Government health Model and Government Education Model. Tables 4 and 5 simplify the cointegration bound test for both model.

#### *Government Health and Education Models*

Based on Table 3, the computed F-statistic value is 6.107877, which is higher than lower and upper bound critical value at 99 percent of significant level 3.29 and 4.37 respectively. Thus, the null hypothesis of no cointegration is rejected at 99 percent significant level. Therefore, it can be concluded that the long-run relationship between the insurance demand, gross domestic product, inflation rate, government health expenditure and real interest rate exist in Malaysia for government health model.

**TABLE 3:** Bound test result for Malaysia in Health

Level of Significance	Lower Bound Value	Upper bound value	F-statistics value
10%	2.2	3.09	6.107877
5%	2.56	3.49	6.107877
2.5%	2.88	3.87	6.107877
1%	3.29	4.37	6.107877

(Source: Calculated by using EViews 10 Software)

**TABLE 4:** Bound test result for Malaysia in Education

Level of Significance	Lower Bound Value	Upper bound value	F-statistics value
10%	2.2	3.09	9.618135
5%	2.56	3.49	9.618135
2.5%	2.88	3.87	9.618135
1%	3.29	4.37	9.618135

(Source: Calculated by using EViews 10 Software)

Table 4 simplify the cointegration bound test results for Malaysia under government education expenditure (EDU) model. The computed F-statistic is 9.618135 for Malaysia which are higher than lower and upper bound critical value at 99 percent of significant level 3.29 and 4.37 respectively. Thus, the null hypothesis of no cointegration is rejected at 99 percent significant level. Therefore, the long-run relationship between the insurance demand, gross domestic product, inflation rate, government education expenditure and real interest rate exist both of countries which is detected in Malaysia.

*ARDL Long Run Results*

*Government Health Model*

**TABLE 5:** The Estimated for ARDL Long Run Model for Malaysia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-1.369092	0.303028	-4.518040	0.0020***
INF	-0.009168	0.004159	-2.204498	0.0586**
HEALTH	1.116191	0.092542	12.06144	0.0000***
RIR	-0.160629	0.034452	-4.662405	0.0016***
C	5.357154	0.710218	7.542974	0.0001***

Note: \*\*\* and \*\* indicates at 5% and 1% significance level respectively.

(Source: Calculated by using EViews 10 Software)

The next step is estimated the coefficients for the long run model. This step will cover for both, HEALTH and EDUCATION model for Malaysia. Table 5 simplify the ARDL long run estimation, HEALTH model for Malaysia. Based on the Table 5, the government health expenditure has a positive impact on insurance demand in Malaysia. Meanwhile, gross domestic product (GDP), inflation rate and real interest rate have a negative impact on insurance demand. The coefficient for GDPPC, HEALTH and RIR shows that they are statistically significant at 99 percent significant level. Besides, the coefficient for inflation rate (INF) indicates the statistically significant at 95 percent significance level. The value of coefficients of HEALTH is 1.116191 which means that an increase of 1 percent in government health expenditure is related to increase 1.11 percent in insurance demand. Moreover, in INF rise by 1 percent, it will lead the insurance demand to decline by 0.9168 percent. As a result, the estimated result for Malaysia demonstrated that factors such as the real interest rate, government health expenditure, inflation rate, and gross domestic product significantly impacted the insurance demand in the long run.

*Government Education Model***TABLE 6:** The Estimated Results for ARDL Long Run Model for Malaysia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.124260	0.286369	0.433916	0.6746
INF	-0.034224	0.014147	-2.419101	0.0387**
EDU	0.818502	0.138642	5.903693	0.0002***
RIR	-0.586759	0.074540	-7.871738	0.0000***
C	1.152388	1.036119	1.112216	0.2949

Note: \*\*\* and \*\* indicates at 5% and 1% significance level respectively.

(Source: Calculated by using EViews 10 Software)

Table 6 shows estimated long run coefficient the ARDL approach for Malaysia. Specifically, the results focus for Government Education Expenditure (EDU). The results indicated that gross domestic product (GDP) and government education expenditure (EDU) have positive impact on insurance demand (INS). However, the inflation rate (INF) and real interest rate (RIR) has negative relationship with insurance demand. The coefficient of EDU and RIR indicated that they are statistically significant at 99% significant of level. Besides, inflation rate (INF) is statistically significant at 95% significance level. The value of coefficient on EDU is 0.818502 which means that an increase of 1% in government education expenditure will be increase on 0.8185 percent on insurance demand. However, 1% increase in real interest rate will decrease 0.5867 percent on insurance demand. The reverse reaction between these two indicator, due to negative relationship between real interest rate and insurance demand. Based on the results, its confirmed that the indicator including INF, EDU and RIR have impacted the insurance demand in the long run.

*ARDL Short Run Results*

The next step is estimated the coefficients for the short run model for both health and education model. Table 7 presents the short-run coefficients based on ARDL model. Under health model, the total inflation negatively and significantly impacts the insurance demand in the short-run. A 1.0000% increase in the inflation will decline the insurance demand by -0.007530% at lag 2. Similar relationships consistently occur for real interest rate (lag 1) with exerting negative impacts on insurance demand. In other words, if real interest rate increase, insurance demand will accordingly decreased. But, in overall the real interest rate exerting the insurance demand with mixed results between negative and positive results. Conversely however, the gross domestic product exerts significantly positive impact on insurance demand in Malaysia. If gross domestic product increases by 1.0000%, the insurance demand will rise by 4.205974%. The GDP also significantly affect insurance demand in the short-term at 99% significant level (lag 2). Interestingly, the result successfully highlighted the role of government health expenditure in the model. According to the result, the government health expenditure is negatively in impacting the insurance demand in the short run. Specifically, at lag 2, if the government health expenditure rise by 1.0000%, it will lead the insurance demand to decline by -0.775531%.

Moreover, under education model, the results are slightly different. Based on Table 8, the inflation exerts negative and significant impact on insurance demand. If the inflation increases by 1.0000%, insurance demand will duly decline by -0.010944%. The results further shows that, the education expenditure and real interest rate will impact the insurance demand with mixed results, between negative and positive sign. Similarly, the gross domestic product also significantly impacts insurance demand in the shortrun. The values of  $R^2$  and adjusted  $R^2$  were estimated to be more than 90%, which confirm that the estimated models for both models are strongly fitted. The calculated values for F-statistic were 58.3245 and 68.7712 for health and education models, respectively. Further, the significant negative error correction term coefficient is also presented in Tables 7 and 8. The results suggest that the error correction term (ECTt-1) for health and education models are -1.372976

and -0.892838 respectively. The results of the study found the error correction term (ECT) is significant and always has a negative value indicating existence long-term relationship (co-integration) between explanatory variables with demand of insurance. Besides, a negative ECT value for both models also indicates speed time adjustment (speed of adjustment) required to reach equilibrium in the long term long. The study confirms that the ARDL models have passed all the diagnostic analyses successfully.

**TABLE 7:** The ARDL Short Run Health Model Estimated Results for Malaysia

<b>Dependent Variable: D(INS)</b>				
Selected Model: ARDL(1, 3, 3, 4, 3)				
Case 2: Restricted Constant and No Trend				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
D(GDP)	0.062152	0.233545	0.266125	0.7969
D(GDP(-1))	2.533572	0.511213	4.956005	0.0011***
D(GDP(-2))	4.205974	0.670433	6.273515	0.0002***
<b>D(INF)</b>	<b>-0.019627</b>	0.003312	-5.925906	0.0004***
<b>D(INF(-1))</b>	<b>-0.012447</b>	0.002412	-5.160326	0.0009***
<b>D(INF(-2))</b>	<b>-0.007530</b>	0.002543	-2.960845	0.0181**
D(HEALTH)	0.936600	0.086323	10.84989	0.0000***
<b>D(HEALTH(-1))</b>	<b>-0.356885</b>	0.120050	-2.972796	0.0178**
<b>D(HEALTH(-2))</b>	<b>-0.775531</b>	0.153927	-5.038318	0.0010***
D(HEALTH(-3))	0.153469	0.064429	2.381987	0.0444**
D(RIR)	-0.100350	0.020097	-4.993338	0.0011***
D(RIR(-1))	0.073460	0.019914	3.688753	0.0061***
D(RIR(-2))	0.042956	0.013620	3.153922	0.0135**
CointEq(-1)*	-1.372976	0.177916	-7.716981	0.0001***
<b>R-squared</b>	0.977382	<b>Mean dependent var</b>		0.025153
<b>Adjusted R-squared</b>	0.954765	<b>S.D. dependent var</b>		0.052283
<b>S.E. of regression</b>	0.011120	<b>Akaike info criterion</b>		-5.854010
<b>Sum squared resid</b>	0.001607	<b>Schwarz criterion</b>		-5.182095
<b>Log likelihood</b>	93.02914	<b>Hannan-Quinn criter.</b>		-5.654215
<b>Durbin-Watson stat</b>	1.989589	F-Stat		58.3245

Note: \*\*\* and \*\* indicates at 5% and 1% significance level respectively.

(Source: Calculated by using EViews 10 Software)

**TABLE 8:** The ARDL Short Run Education Model Estimated Results for Malaysia

<b>ARDL Error Correction Regression</b>				
Dependent Variable: D(INS)				
Selected Model: ARDL(1, 3, 2, 3, 4)				
<b>ECM Regression</b>				
<b>Case 2: Restricted Constant and No Trend</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>

D(GDP)	0.659376	0.251417	2.622636	0.0277**
D(GDP(-1))	1.330168	0.321965	4.131400	0.0026***
D(GDP(-2))	2.007196	0.296332	6.773472	0.0001***
D(INF)	-0.022209	0.003407	-6.517774	0.0001***
D(INF(-1))	-0.010944	0.003388	-3.229930	0.0103**
D(EDU)	0.438618	0.082507	5.316118	0.0005***
D(EDU(-1))	-0.444950	0.103381	-4.303983	0.0020***
D(EDU(-2))	-0.816398	0.106281	-7.681471	0.0000***
D(RIR)	-0.036974	0.020036	-1.845324	0.0981*
D(RIR(-1))	0.403529	0.056363	7.159502	0.0001***
D(RIR(-2))	0.301005	0.041774	7.205597	0.0001***
D(RIR(-3))	0.084839	0.019540	4.341809	0.0019***
CointEq(-1)*	-0.892838	0.094234	-9.474664	0.0000***
<b>R-squared</b>	0.949079	<b>Mean dependent var</b>		0.025153
<b>Adjusted R-squared</b>	0.905432	<b>S.D. dependent var</b>		0.052283
<b>S.E. of regression</b>	0.016078	<b>Akaike info criterion</b>		-5.116540
<b>Sum squared resid</b>	0.003619	<b>Schwarz criterion</b>		-4.492618
<b>Log likelihood</b>	82.07329	<b>Hannan-Quinn criter.</b>		-4.931015
<b>Durbin-Watson stat</b>	2.851261	F stat		68.7712

Note: \*\*\* and \*\* indicates at 5% and 1% significance level respectively.

(Source: Calculated by using EViews 10 Software)

## CONCLUSION

This study evaluates the impact of the determinants of insurance demand for Malaysia in a thirty two year period from 1990 to 2022. This study explore the dynamic relationship between insurance demand with selected macroeconomic variables including gross domestic product, inflation rate, government health expenditure, government education expenditure and real interest rate in Malaysia is explore by utilizing the Autoregressive Distributed Lag (ARDL) model, in short run and long run. There are positive and negative impacts from observed variables on insurance demand either in the long term or short term. For instance, in the short run, the gross domestic product effect the insurance demand negatively but not in the education model. Meanwhile, the real interest rate contributes the mixed sign of relationship in education model, but consistence positive sign in education model. Moreover, the inflation rate variables consistently impacting the inflation demand negatively in the both model. Surprisingly, education expenditure and health expenditure give the mixed sign. As a conclusion, based on these findings, what can be suggested is that when the government allocates appropriate expenditure for the development of health and education in the country, it will cause the people's dependence on insurance ownership to decrease. It is likely that the better the health facilities in the country and the better the level of education obtained by the people will produce a generation that is literate in taking care of health. Therefore, in the long term, it can be said to be a saving for the country.

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# **CLUSTER ANALYSIS ON LONG-TERM ELDERLY CARE SYSTEMS IN MALAYSIA: LESSON LEARNT FROM JAPAN, SINGAPORE AND THE UNITED STATES OF AMERICA**

*(ANALISIS KELOMPOK MENGENAI SISTEM PENJAGAAN JANGKA PANJANG WARGA  
EMAS DI MALAYSIA: PENGAJARAN YANG DIPEROLEH DARIPADA JEPUN,  
SINGAPURA DAN AMERIKA SYARIKAT)*

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## **ABSTRACT**

*This research examines key effective elements for long-term elderly care or commonly known as long-term care (LTC) systems in Malaysia. Three jurisdictions, namely, Japan, Singapore and the United States of America, have been selected for cluster analysis of two typologies including organisational and financial. The selection of these three jurisdictions is in line with the healthcare and elderly policy objectives aspired by Malaysia, which are to ensure healthy ageing, promote universal and comprehensive protection, and encourage social or community-based care. Cluster analysis of the two typologies focuses on seven variables includes means-tested assessment, entitlement towards LTC services, cash benefits, choice of care provider, financing mechanism, cost sharing and LTC expenses. This analysis is complemented by qualitative data, particularly on demographic profiles, policy approach in the LTC systems, and policy objectives of the LTC systems. It is observed that a mandatory participation of long-term care insurance provides opportunity for inclusive coverage for the older person; recognition of the community-based care enables comprehensive benefits including preventive care; establishment of centralised administrator facilitates the effectiveness of the LTC systems; established mean-tested assessment ensures fairness, transparency and inclusion of the targeted segments; and public-private arrangements of funding mechanism ensures sustainability of the programmes. Results indicate that three elements must be present to facilitate an effective LTC policy design for Malaysia, which are: defined scope of recipients, comprehensive benefits and sustainable financing models. For the first, the scope of recipient to be expanded to include bottom 40% (B40) segments instead of limited to hardcore poor. The second element is the benefits, which should include preventive care, an early treatment of elderly's related disease to reduce LTC expenses at later stage. Lastly, the inclusion of public-private arrangements of funding mechanism ensures the sustainability of the financing. Ultimately, an effective LTC systems for the elderly must be supported by all stakeholders, including government, communities and the elderly itself.*

*Keywords: Bottom 40% Segment; Cluster Analysis, Elderly; Long-term Care; Policy Design*

## ABSTRAK

*Kajian ini bertujuan untuk menentukan elemen utama dalam penjagaan warga emas jangka panjang atau biasanya dikenali sebagai sistem penjagaan jangka panjang (PJP) di Malaysia. Tiga negara, iaitu, Jepun, Singapura, Amerika Syarikat, telah dipilih untuk analisis kelompok berkaitan organisasi dan kewangan. Pemilihan ketiga-tiga negara ini adalah selaras dengan objektif dasar penjagaan kesihatan dan warga tua di Malaysia, iaitu untuk memastikan penuaan yang sihat (healthy ageing), menggalakkan perlindungan sejagat (universe) dan menyeluruh serta menggalakkan penjagaan yang berasaskan sosial atau komuniti. Analisis kelompok bagi kedua-dua tipologi ini memberi tumpuan kepada tujuh pembolehubah iaitu penilaian teruji cara (means-tested), kelayakan ke atas perkhidmatan PJP, faedah tunai, pilihan institusi perkhidmatan, mekanisme pembiayaan, perkongsian kos dan perbelanjaan PJP. Analisis ini disokong dengan data kualitatif, iaitu profil demografi, pendekatan yang digunapakai dan objektif dalam perangkaan dasar sistem PJP. Berdasarkan pemerhatian, penyertaan secara mandatori dalam insurans penjagaan jangka panjang boleh memberi perlindungan menyeluruh; pengiktirafan dalam penjagaan berasaskan komuniti pula boleh memberi manfaat secara menyeluruh termasuk penjagaan pencegahan; penubuhan pentadbiran berpusat bertujuan memudahkan pengurusan system PJP; penilaian 'means-tested' dapat memastikan keadilan, ketelusan dan ketepatan segmen sasaran; dan kerjasama awam-swasta dalam membiayai perbelanjaan PJP pula dapat memastikan kesinambungan program. Hasil kajian mendapati tiga elemen telah dikenalpasti bagi perangkaan dasar PJP yang berkesan di Malaysia, iaitu: penerima yang khusus, manfaat yang menyeluruh dan model pembiayaan yang mampan dan berterusan. Bagi elemen pertama, skop penerima meliputi segmen 40% terbawah (B40) dan bukannya terhad kepada golongan miskin tegar. Elemen kedua ialah program yang disediakan hendaklah merangkumi penjagaan pencegahan. Ini kerana rawatan awal penyakit berkaitan warga emas dapat mengurangkan perbelanjaan PJP pada masa hadapan. Akhir sekali, kerjasama badan kerajaan dan swasta dapat memastikan pembiayaan kewangan yang mampan dan berterusan. Walaubagaimanapun, sistem PJP yang berkesan mestilah disokong oleh semua pihak berkepentingan, termasuk kerajaan, komuniti dan warga tua itu sendiri.*

*Kata kunci: Analisis Kelompok, Penjagaan Jangka Panjang; Perangkaan Dasar; Segment Bawah 40%; Warga Emas.*

## INTRODUCTION

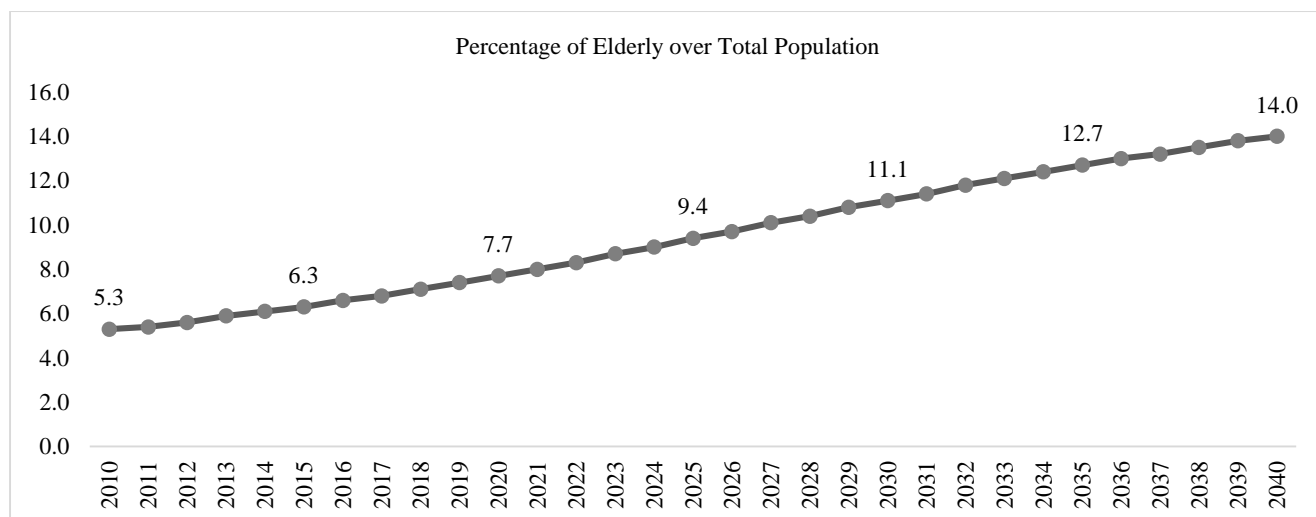
The elderly population is defined as people aged 65 and above (*Elderly Population*, 2019) and according to United Nations, can be divided into three categories, which are an ageing society, an aged society and a super-aged society when the elderly ratio<sup>1</sup> reaches 7%, 14% and 20%, respectively. In 2020, Malaysia was categorised as an ageing society as the elderly ratio was 7.2% in 2020, together with Singapore (13.2%), Thailand (13.9%) and Vietnam (8.4%) (*Population Ages 65 and above (% of Total Population)*, 2022).

Rafalimanana (2020) in their World Population Ageing 2020 report indicated that it is expected that the number of elderly population will reach 1.5 billion (16% of the global population) in 2050 reaching towards an aged society. Nevertheless, data showed that, Malaysia will age at faster rate and become an aged society as early as 2040, with elderly ratio of 14.1% (6 million), an increase almost double compared to 2020 as shown in Source: (Department of Statistics, 2016)

**FIGURE 1** below (Department of Statistics, 2016).

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<sup>1</sup> measured by dividing number of persons aged 65 years and above over total population



Source: (Department of Statistics, 2016)

**FIGURE 1:** Percentage of Elderly over Total Population

Ageing of population impacts various stakeholders, including the older people themselves, government and communities (OECD/WHO, 2020). These stakeholders have formed a basic LTC systems and the overarching pressure of the systems is to ensure healthy ageing (OECD/WHO, 2020). There are two major impacts on the elderlies including biological changes such as a gradual decrease in physical and mental capacity, and the growing risk of disease and ultimately death (Institute on Aging., 2020). In a recent study, McMaughan et al. (2020) conclude three relationships exists arising from socioeconomic status (SES), health condition and access to healthcare. The first relationship is that poverty reduces access to healthcare, which leads to increased morbidity and further reductions in access to care (McMaughan et al., 2020). Secondly, lower economic status leads to poorer health, which in turn leads to a continued poverty (McMaughan et al., 2020). Finally, low SES is associated with poorer health and contributed to a heavier disease burden, hence reducing the quality of life (McMaughan et al., 2020). Therefore, special attention shall be given to lower income segment.

Government plays an important role in facilitating the LTC systems. In facilitating government’s role in the LTC systems, Mcmaughan et al. (2020) suggest that removing the financial barriers to healthcare access, such as providing universal healthcare coverage, can improve health outcomes. Similarly, Shahar et al. (2019) also made suggestions on the need to develop specific cost-effective strategies and a sustainable intervention model to improve the quality of life of lower income segments. These recommendations create interest to this research to explore the possible variables for optimum policy design for the elderly in Malaysia. Hence, this research examines the key elements of the effective LTC systems in Malaysia using cluster analysis of organisational depth and financial generosity of the selected jurisdictions. This research is expected to have direct benefits to the government and the bottom 40% (B40) segments. For the government, this research contributes to the identification of key elements required for optimal solutions of the LTC systems and reduce the complexity of the policy design. For the elderly, particularly the B40 segments, the implementation of the effective policy enables the continuous access to the LTC services as well as to increase the quality of health. This is in line with the primary goals of the LTC, which are to alleviate pain, reduce or manage the deterioration in health status and assist the elderly to live independently (*OECD Health Statistics 2021 Definitions, Sources and Methods*, 2021).

**LITERATURE REVIEW**

Since government intervention is very critical, a comprehensive review of the existing national policy on the LTC systems is required in ensuring successful ageing, which is defined as the process of developing and maintaining the functional ability that enables well-being in older age (*Decade of*

*Healthy Ageing Functional Ability Intrinsic Capacity*, 2020; McMaughan et al., 2020). However, design of LTC systems is a complex process due to the three main factors, which are: no clear criteria to define the responsibility of each sector; the existence of different levels of government's agencies; and the involvement of numerous stakeholders with diverse needs and interests (Dintrans, 2019; *Health Policy*, 2022; Naoki Ikegami et al., 2001). Therefore, in managing this complexity, there is a need to have explicit objectives and visions for the future, to clarify the challenges associated with the health systems and to specify decisions, plans and actions (*Health Policy*, 2022). In addition, identification of appropriate grouping or typology in the LTC systems are equally critical to improve understanding on how the LTC is embedded in the wider welfare state and how it related to other welfare state institutions is (Kraus et al., 2010; Reibling et al., 2019). Thus, enabling a well-informed decision by policymakers in designing ageing policy. With the involvement of six ministries and two department, limited resources, and decentralised of the LTC systems, Malaysia can be considered as having a complex LTC systems.

In Malaysia, the cost to obtain private LTC services is considerably high as the cost ranges from RM1,000 to RM5,000 per month depending on the level of disability (Surendra, 2016). Hence, the services would not be easily accessible by the B40 segments as their monthly residual income is only RM346 per month (Hawati Abdul Hamid et al., 2019). Another study conducted by Shair and Purcal (2021) found that the cost per quality-adjusted life-years for a nursing home for disabled people in Malaysia is RM57 822, which proves to be inefficient and surpasses the willingness to pay, which is ranges RM19,929 to RM28,470. In addition, lower income group is observed to have poor health conditions, high risk of both under- and over nutrition, face various health challenges and contribute to the vulnerability of health and community-living of older adults (Noor et al., 2020; Shahar et al., 2019; Shlisky et al., 2017). Therefore, support from the government is critical.

In designing an effective ageing policy, there are two strategic planning involve, which are identifying policy objectives and determining appropriate typologies and variables.

### **Policy Objectives of the LTC Systems**

A detailed discussion on how to define a policy for an ageing population started with the publication of Key Policy Issue in Long-term Care by WHO in 2003. WHO (2003) has identified four prerequisites in assessing and designing an ageing policy, including identification of the desired goal, identification of scope of the benefits, identification of the target group, and prioritising the issues. Example of the desired goal is to ensure that an individual who is not fully capable of long-term self-care can maintain the best possible quality of life, with the greatest possible degree of independence, autonomy, participation, personal fulfilment and human dignity ("Key Policy Issues in Long-Term Care," 2003). The second prerequisite, which is to identify the scope and extent of its LTC coverages might include activities undertaken by people requiring care by informal caregivers (family, friends and neighbours), by formal caregivers, including professionals and auxiliaries, and by traditional caregivers and volunteers ("Key Policy Issues in Long-Term Care," 2003). The third prerequisite, which is to identify the target groups can refer people who are chronically ill, individuals with disabilities, people with sensory limitations and mentally ill individuals, including people with dementia ("Key Policy Issues in Long-Term Care," 2003). The last condition is to prioritise issues to be resolved for example principle of eligibility and integration of the LTC services with general health and social services ("Key Policy Issues in Long-Term Care," 2003). In addition, Beard et al. (2016) suggested three main proposals to ensure healthy ageing, which are to establish the foundations for a system of LTC, to ensure a sustainable and appropriately trained workforce for the LTC and to ensure the quality of the LTC.

In Malaysia, the discussion on policy objectives for the LTC systems has been discussed since the late 1990s when Karim H (1997) highlighted that a health policy on ageing is needed to promote universally available, equitable, and quality health services to meet challenges arising from the ageing population. In 2013, Goh et al. (2013) suggested that the government should implement comprehensive social insurance for long-term care to ensure protection and equal treatment received by the elderly. These policy objectives, which are further reiterated in Malaysia's input for the cluster on LTC and palliative care are to provide social support for and LTC needs of older person ("Malaysia's Input for Cluster on Long-Term Care and Palliative Care for Deliberation at the 9th Session Open-Ended Working Group on Ageing," 2018). The input also included the role of the Malaysian Social Protection

Council<sup>2</sup> to review and formulate a comprehensive social protection system in Malaysia (“Malaysia’s Input for Cluster on Long-Term Care and Palliative Care for Deliberation at the 9th Session Open-Ended Working Group on Ageing,” 2018). In addition, the input also stated that there has been a policy shift from institutional care to community-based care whereby direct government intervention might be minimal (“Malaysia’s Input for Cluster on Long-Term Care and Palliative Care for Deliberation at the 9th Session Open-Ended Working Group on Ageing,” 2018). The shift is consistent with the observation made Poi et al. (2004) as the cultural values are rapidly changing, investment in community-based care initiatives is required. The investment include rehabilitation for elderly from the acute illness to help return the older patient to the level of pre-morbid function (Poi et al., 2004). In recent years, the former Minister of Health, Y.B. Khairy Jamaluddin at 75th Session of World Health Assembly in Geneva on 24 May 2022 urged that all countries must work towards universal coverage (“Country Remarks by Khairy Kamaluddin, Minister of Health Malaysia at 75th World Health Assembly 22-28 May 2022, Geneva,” 2022).

### **Jurisdictions, Typologies and Variables Used to Evaluate the LTC Systems**

Following up with the report produced by WHO (2003) on policy and design issues in the LTC, Krause et al. (2010) reiterate that matrix that focuses on primary and other design policies can be used in deciding the appropriate LTC systems. However, due to data limitations, a new grouping or typology based on a clustering method which is based on similarities in the selected jurisdictions has been proposed (Kraus et al., 2010). The new grouping involves two approaches, which are system characteristics and financing cares (Kraus et al., 2010). Both approaches lead to the ultimate objective, which is to make a sensible classification of countries according to their LTC systems. Then, Mor et al. (2014) extend the LTC typologies to include quality regulations. Coupled with findings made by Trigg (2018) and Leone et al. (2014), the key factors proposed are centralised versus decentralised regulation and single versus multiple levels of responsibility.

Further development in identifying appropriate typologies continued when Joshua (2017) expanded the scope of financing, considering both social insurance and general taxation, to address concerns regarding the financial sustainability in LTC. For example, either by increasing private funding (e.g. limiting entitlements or increasing out-of-pocket payments), increasing productivity growth or reducing unit costs (Joshua, 2017). In 2020, Royal Commission into Aged Care Quality and Safety, Australia, identifies three typologies in assessing areas of improvement for older Australians. The first typology is organisation and financing, which include means-tested assessment, entitlement to LTC, availability of cash benefits, choice of providers, quality of assurance, quality of coordination between LTC and other services, and cost-sharing (Dyer SM et al., 2020). The second grouping is quality regulation, which includes responsibility for regulation, publicly available quality information, regulatory approach, quality assurance and LTC worker, and the last grouping is additional information on financing, which include the source of funding, out-of-pocket costs and type providers (Dyer SM et al., 2020). As a result, the eight key areas for improvement have been identified, which are: support for home-based care and informal carers; level of regulations; professionalism of the workforce; transparency in staffing levels; transparency in quality of care indicators; integration with the healthcare systems; reablement; and human rights providers (Dyer SM et al., 2020).

Three countries have been selected for this research, which are Japan, Singapore and the United States of America (USA) due to their value proposition. Japan is selected as this country has reached its level of maturity, undergone massive changes to the LTC systems, has dedicated policy and focus on LTC services, and provided coverage to all population. In the case of Singapore, the selection is due to its unique multi-ethnic country, which is similar to Malaysia and has moved to more holistic view of ageing, health, and care, along with policies and systems related to the LTC. In addition, both countries are observed to have explicitly preventive health care in their LTC systems. The USA has been selected due to its similarity with Malaysia, which ensure that the lower income segment has minimum coverage or safety net. In addition, the USA is observed to have a dedicated policy and focus on the LTC services. Furthermore, the USA has started the LTC systems since 1935 (*Long-Term Care in the United States: A Timeline*, 2015). In this regard, market scanning on demographic profile, policy approach and the

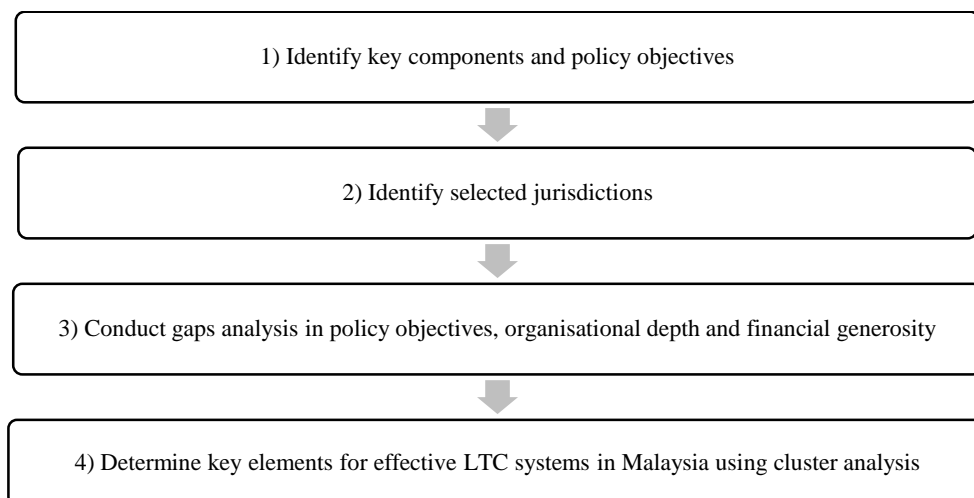
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<sup>2</sup> which was set up in 2016

elderly policy objective have been conducted for better understanding of these jurisdictions. Thus it is of the interest of this research to compare the existing LTC systems in Malaysia with these three jurisdictions and proposes key elements for effective LTC systems in Malaysia. The analysis will be based on two cluster of typology, which is organisational depth and financial generosity of the selected jurisdictions.

## METHODOLOGY

Cluster analysis in this research is based on the two sets of typologies, which are organisational depth and financial generosity. Each cluster is supported by four and three variables, respectively, which are: means-tested assessment, entitlement towards LTC services, cash benefits, choice of provider, financing mechanism, cost sharing, and LTC expenses. The research design is based on FIGURE 2 below.



**FIGURE 2:** Research design

Data sets or information used in this research are the number of total and the elderly population, the elderly ratio, policy approach, policy objective, means-tested assessment, entitlement to LTC, availability of cash benefits choice of provider, cost sharing, and amount of LTC expenses. While general understanding of the elderly age is 65 years and above, however, in some jurisdiction like Malaysia, government's initiative starts at age of 60 years (*Senior Citizen*, 2023). However, in the case of Japan, the elderly age starts at age 65 (Ouchi et al., 2017). Data and information are sourced from government's official website like Ministry of Health (MOH) and Department of Statistics, Malaysia; website of the reputable organisations such as Organization for Economic Cooperation and Development (OECD), World Health Organization (WHO) and World Bank; as well as website of the selected jurisdictions.

The first step is to identify the key components and policy objectives. Guided by policy aspiration in Karim H (1997), WHO (2003), Poe et al, (2004), United Nations (2018), OECD/WHO (2020) and MOH (2022), three main stakeholders, which are the elderly, government and communities play a vital role to ensure healthy ageing, promote universal and comprehensive protection, and encourage social or community-based care. These objectives should be embedded in the LTC systems in Malaysia. The second step is to identify the selected jurisdictions for meaningful review and comparison. Based on the market scanning, the third step of this research is conducted i.e. to identify potential gaps and areas of improvement in LTC systems in Malaysia. Gaps are guided by the identified policy objectives for Malaysia. In this stage, a combination of typologies proposed by Kraus et al. (2010) and Dyer SM et al. (2020) is used, which are organisational depth and financial generosity. These two grouping forms the basic cluster analysis of this research. The first cluster, which is organisation consists of four variables, which are means-tested assessment, entitlement to LTC,



availability of cash benefits and choice of provider. The second cluster is financing with three variables, namely, financing mechanism, cost sharing and amount of LTC expenses. The last step is to determine key elements for effective LTC systems in Malaysia by transforming the information and description into ordinal scale/pseudo matrix variables. This is to create an index for the organisational depth,  $IO_i$  and an index for the financial generosity,  $IF_i$ . The equations are as follows:

$$IO_i = \sum_{j=1}^n O_{ji} \tag{1}$$

$$IF_i = \sum_{k=1}^n F_{ki} \tag{2}$$

Where:

$i = 1, 2, 3, 4$  countries under the study i.e. Malaysia, Japan, Singapore and the USA

$O_j$  are the organisational typology with  $j$  variables.

$j = 1, \dots, 4$ , where 1 is the means-tested assessment, 2 is the entitlement to LTC, 3 is the availability of cash benefits, 4 is the choice of provider

$F_k$  are the financing typology with  $k$  variable.

$k = 1$  and  $3$ , where 1 is types of financing mechanism, 2 refer to availability of cost sharing, and 3 refer to value of amount of expenses, as % of gross domestic product (GDP)

For the purpose of this research, the definition of the variables follow the common interpretation, except where the interpretation can be subjective, the specific interpretation has been defined. The means-tested assessment is used to determine the eligibility of the elderly to for government assistance (*Financial Assessment (Means Test) for Social Care*, 2022). The entitlement refer to all or specific segment of population that might receive initiatives provided by the government (*Entitlement*, n.d.).

**TABLE 1 .** Definition of ordinal scale of each variables used in cluster analysis

Variables	Ordinal scale
Means-tested assessment	1: means-tested assessment is required 2: means-tested assessment is not required
Entitlement	1: entitlement to LTC is strictly limited to hardcore poor 2: entitlement to LTC is moderate 3: entitlement to LTC is available to all elderly
Cash benefits	1: cash benefits is not available 2: cash benefits is available
Choice of provider	1: government’s initiative is mostly limited to public provider 2: government’s initiative can be accessed in public or private providers
Financing mechanism	1: financing of LTC in public facilities is solely provided by government 2. financing of LTC in public facilities is provided by government and private entities
Cost sharing	1: the elderly (or caregiver) needs to share a portion of the LTC expenses 2: the elderly (or caregiver) do not have to share any the LTC expenses
LTC expenses	1: LTC expenses is less than 0.5% of GDP 2: LTC expenses is between 0.5% and 1% of GDP 3: LTC expenses is between 1% and 1.5% of GDP 4: LTC expenses is between 1.5% and 2% of GDP 5: LTC expenses is more than 2% if GDP

The most effective system is measured by summation of organisational depth and financial generosity as defined in equation (3). The highest the value the more effective of the system.

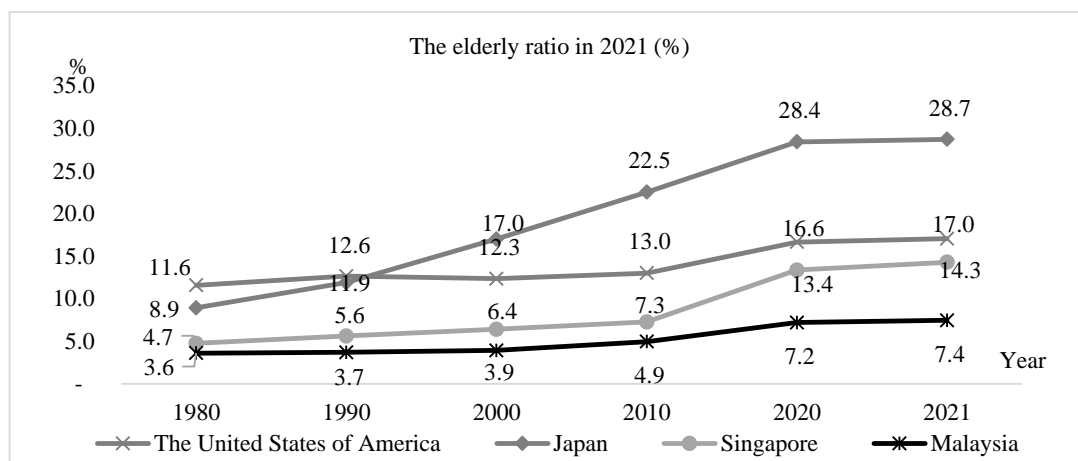
$$Effectiveness_i = \frac{IO_i + IF_i}{\text{maximum value}} \times 100\% \quad (3)$$

Detailed discussion of these analysis is elaborated in section Results and Discussions. A combination of qualitative and ordinal scale will result in determination of key elements that play important role in achieving an effective LTC system in Malaysia. Recommendation on the key elements in the effective LTC systems in Malaysia is explained in section Conclusion.

## RESULTS AND DISCUSSIONS

### Demographic Profile

Malaysia is approaching an ageing society in 2040, which comprise of 6 million older person. Therefore, learning from matured or an aged/super-aged society like the USA and Japan as well as learning from evolving country like Singapore are important. Among these selected jurisdictions, Japan has the highest ageing ratio of 28.7%, followed by the USA of 17% and the ageing ratio for Singapore was 14.3% as shown in FIGURE 3 below (*Population Ages 65 and above (% of Total Population), 2022*).



Source: Population ages 65 and above (% of total population), 2022

FIGURE 3. The elderly ratio for the selected jurisdictions in 2021

### GAPS Analysis

In this subsection, the gaps are analysed based on the three main categories, which are environmental scanning on the policy approach and objective; organisational depth, which include four variables i.e. means-tested assessment, entitlement, cash benefits and choice of provider; lastly is on financial generosity, which include financing mechanism, cost sharing and spending on the LTC services.

### Environmental Scanning: Policy Approach and Objectives

In Malaysia, current LTC policy is guided by Malaysia National Policy on Ageing 2011 (MNPA) (Salleh, 2017). Policy statement of MNPA is the “government’s commitment to create older persons who are independent, with dignity, high sense of self-worth and respected by optimizing their self-potential through a healthy, positive, active, productive and supportive ageing to lead a well-being life” (Salleh, 2017). The policy objectives are to develop caring communities, to increase awareness on ageing phenomenon, to create an effective and integrated delivery system on older persons, to facilitate access to lifelong learning, to enhance older persons’ participation in community, to ensure protective and safe environment for the older persons and to encourage application of research findings on older

persons program planning, monitoring and evaluation (Salleh, 2017). In implementing the policy objectives, six ministries and two departments involved, which are MOH, Ministry of Women, Family & Community Development, Ministry of Education, Ministry of Housing and Local Government, Ministry of Human Resource, Ministry of Science, Technology and Innovation, Department of Social Welfare and Economic Planning Unit. Based on this arrangements, LTC systems in Malaysia meet criteria of complex system, which will reduce the effectiveness of the systems. In addition, LTC systems in Malaysia is heavily rely on public arrangement.

In Japan, the LTC system is based on public and private arrangement via mandatory participation in long-term care insurance (LTCI) (Health and Global Policy Institute, 2019; Yamada & Arai, 2020). LTCI was introduced in 2000, using a concept of a user-oriented social insurance system (Yamada & Arai, 2020), to reduce the care burden for LTC recipients' families (Japan Institute for Labour Policy, 2016). This is to ensure all segment of populates have access to the LTC programmes, in other word, Japan is subscribing to universal LTC coverage (Health and Global Policy Institute, 2019). The LTC programmes cover from preventive care to end of life treatment. The system is centralised under Municipal government and involved public and private care providers (Yamada & Arai, 2020). The Municipal government sets the premium and licenses the LTC providers (*Long-Term Care Insurance*, 2016). It is observed that LTCI structure with centralised administrator provides enabler for Japan to achieve universal coverage.

In Singapore, newly published action plan, titled "Living life to the fullest" focused on 3Cs: Care, Contribution and Connectedness was launched in Jan 2023 (*Living Life to the Fullest*, 2023b). The policy objectives are: to empower seniors to take charge of their physical and mental well-being through preventive health initiatives; to enable seniors to continue contributing their knowledge and expertise by enhancing the learning; and to support seniors to age in the community (*Living Life to the Fullest*, 2023b). In implementing the action plan, MOH, Singapore is supported by Agency for Integrated Care, Ministry of Social and Family Development, Health Promotion Board and People's Association. The systems involve active collaboration between public and private institutions.

Similarly, public and private arrangements play a vital role in the LTC systems in the USA. Both institutional care and community-based care services involve in implementing the broad objective of the LTC in the USA, which is to improve health and well-being for older adults (*Long-Term Care in the United States: A Timeline*, 2015; *Older Adults*, n.d.). According to the Hendry J. Kaiser Family Foundation (2015), the LTC systems in the USA started from the era of nursing homes (1935-1970), followed by the era of community-based services (1970-2010) and currently under the era of health reform (2010-current). In managing the healthcare services, Health Care Financing Administration, currently known as Centres for Medicare and Medicaid Services (CMS), has been established in 1977 (*Why Is CMS in Baltimore?*, 2021). In 2014, the CMS finalised the programmes related to services provided by home and community based care (*Long-Term Care in the United States: A Timeline*, 2015).

In summary, one area of improvement that can be emulated in Malaysian context is the active engagement, coordination and collaboration between public and private entities. In addition, the existence of the centralised administrator will further facilitate the management of the LTC services and reduces the complexity of the LTC systems in Malaysia.

### **Cluster 1: Organisational Depth**

Initial organisational or benefits of LTC services in Malaysia are provided by family members or relatives and government. The next phase is the emergence of private service providers due to the high demand for LTC (Hamdy & Md Yusuf, 2018). As a result, a total of 358 care centres for older person has been registered with JKM in 2019 ("Social Welfare Statistics Report 2019," 2020) There are six main initiatives provided by the government, which are: monetary assistance of RM500 per month; activities centres for older people and we care unit; assistance for artificial devices; home for older persons; homes for chronically ill; and home help programme (*Senior Citizen*, 2023). It is acknowledged that community and society involve in providing the LTC services but the coverage is minimal and private services are normally centred in urban areas (Goodson et al., 2021). As per table TABLE 2, the number of recipients is only 151,833 or 15%<sup>3</sup> of the B40 segments or 6.8% of total the elderly in 2019

<sup>3</sup> B40 elderly is 1 million or 45.5% of total elderly in Malaysia (Hamid, 2019)

(“Social Welfare Statistics Report 2019,” 2019). The insignificant number of coverage is driven by stringent eligibility criteria for example, monetary assistance or *Bantuan Orang Tua* (BOT) is only applicable for elderly age 60 years and above and household income does not exceed the poverty line income. On the other hand, *Rumah Seri Kenangan* and *Rumah Ehsan* can only accept the destitute elderly with no heirs/relatives and has no permanent residence.

**TABLE 2.** Number of recipients, 2019

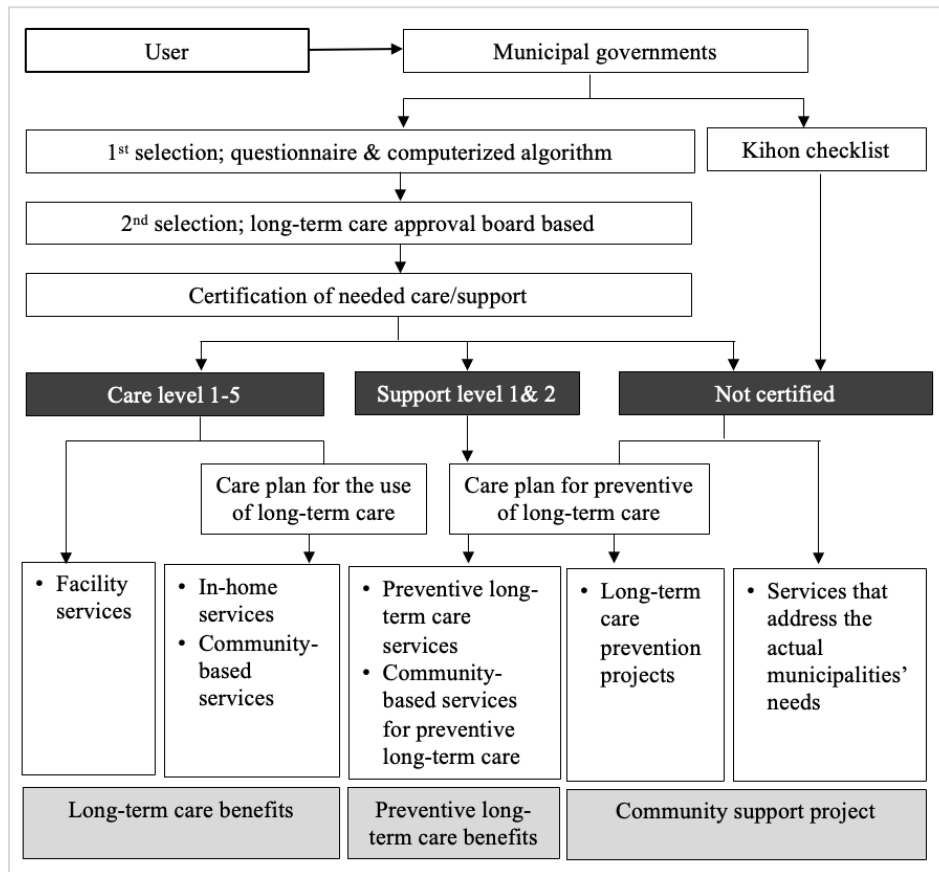
Types of assistance/facilities	Number of recipients
1) Monetary assistance (BOT)	142,325
2) Activity centres for older persons & we care unit	Info not available
3) Artificial Assistance	Info not available
4) Home for older persons ( <i>Rumah Seri Kenangan</i> )	1,405
5) Homes for chronically ill ( <i>Rumah Ehsan</i> )	217
6) Home help program	7,886
<b>TOTAL</b>	<b>151,833</b>

Source: Social Welfare Statistical Report 2019, 2019

In Japan, the LTCI provides various coverage and implement at every stage of the elderly’s life cycle, starting from preventive (early elderly stage) and end of life (later elderly stage). The user will be assessed based on 74-item questionnaire regarding activity of the daily lives. Based on assessment from doctors, the board of the Municipal government will conduct mental and physical condition of the application/user (*The Long-Term Care Insurance System*, 2002). The user then, will be categorised into two types of needs, support or care (Yamada & Arai, 2020). There are 2 levels in support needs and 5 levels in care needs (Yamada & Arai, 2020). The level in the care needs is based on level of disability – 1 represent least disabled person and 5 represent most disabled person (Yamada & Arai, 2020). Access will be given according to the needs and levels such as preventive LTC services, home services and community-based services (Yamada & Arai, 2020). The elderly that are not categorised neither support or care needs might utilise preventive care services (Yamada & Arai, 2020). The procedures for the use of the LTCI is depicted in

Source: Yamada & Arai, 2020

**FIGURE 4** below.



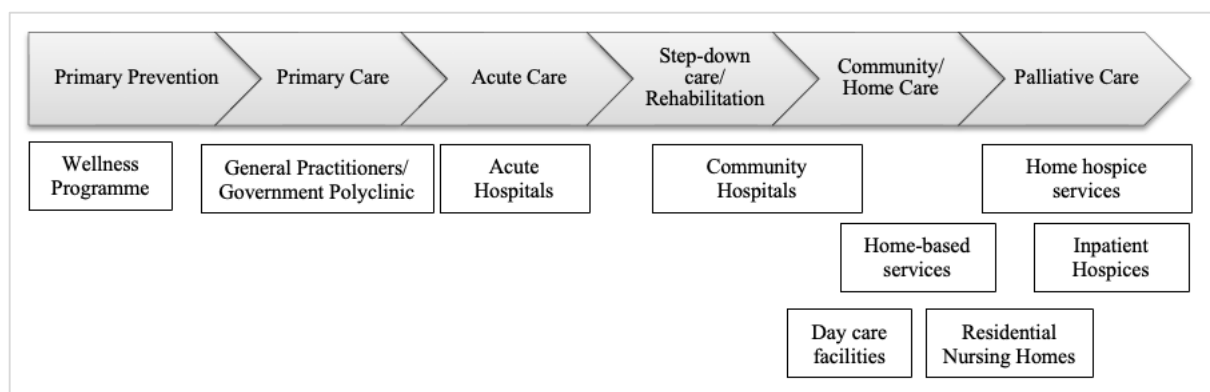
Source: Yamada & Arai, 2020

**FIGURE 4.** Procedures for use of the long-term care insurance

In 2000, LTCI covered 2.18 million certified user and in 2021 the number of certified user increased to 6.84 million (*Statistical Handbook of Japan, 2022*). As a result, the coverage has increased from 6.1% in 2000 to 19.0% in 2021. The LTCI benefits also include in-house treatments without cash benefits (Yamada & Arai, 2020). Since the LTC systems is mandatory and can be accessed by all level of the elderly, no means-tested assessment is required (Centre for Policy Ageing, 2016). Now, LTCI has anchored the LTC benefits in Japan (*Statistical Handbook of Japan, 2022*). It is observed that mandatory participation in the LTCI enables the universal coverage. There is also an active involvement of public and private entities in the LTC systems in Japan for example, in the form of community support projects and community-based services. It is proven that LTCI has enhanced the long-term viability and effectiveness of the LTC systems in Japan.

In Singapore an action plan for successful ageing is the continuation of the public and private entities involvement and the benefits cover from preventive to end of life of the elderly (or palliative care) as illustrated in Source: United Nations, 2015

**FIGURE 5.** “Continuum of Care” – Intermediate and Long-term Care (ILTC) below (*Long-Term Care of Older Persons in Singapore, 2015*).



Source: United Nations, 2015

**FIGURE 5.** “Continuum of Care” – Intermediate and Long-term Care (ILTC)

In terms of types of programmes, there are more than 10 programmes that are available for the elderly and family, which is based on their needs as described in TABLE 3 (*Healthcare Schemes and Subsidies*, 2023a).

**TABLE 3.** Descriptions of programmes that are available in Singapore

Programmes	Descriptions
MediShield Life and CareShield Life	Insurance plan for health and basic LTC, which provide coverage for large hospital bill and monthly cash benefits
MediSave	National medical savings for payment of approved healthcare expenses, especially after retirement
ElderShield	Monthly cash benefits of \$400 for 72 months or \$300 for 60 months, depending on the Eldershield scheme the policyholder is enrolled in
Subsidies programmes	Subsidies ranges (% of expenses or fix amount) for community hospital sub-acute and rehabilitative services, residential LTC services, non-residential LTC services, community and home-based dialysis services, and caregivers training grants
MediFund	Endowment fund set-up by Gov - after utilisation of MediShield Life, private integrated Shield Plans and Medisave
Interim Disability Programme for the Elderly (IDAPE)	Monthly cash benefits of \$150/\$250 - depending on household income
Foreign domestic worker (FWD) levy concession for person with disability	Support household that require FWD to care for seniors and disabled person via lowering the monthly concession of the FWD levy of \$60
Seniors' mobility and enabling fund	Provides subsidies to offset the costs of assistive devices and home healthcare items
ElderFund	Discretionary assistance scheme who are not benefits from CareShield Life, ElderShield and IDAPE, effective from 31 Jan 2020
Home Caregiving Grant	Monthly cash payout of \$200 - replaces the FDW grant, starting from Oct 2019

Source: Healthcare scheme and subsidies, 2023a

For the USA, the LTC systems is arranged by both public and private entities. However, the government programmes play a vital role as lower income segment is highly rely on government initiatives. Since the programmes provide social safety net with the targeted eligibility for persons with a low income and high level of need, a means-tested assessment has been conducted (Karagiannidou & Wittenberg, 2022). For example, to get access to Medicaid programmes, income assessment based on Modified

Adjusted Gross Income as enacted under The Affordable Care Act will be used (*Medicaid Eligibility*, n.d.). There are about six main programmes that are arranged by governments to cater for LTC services, which are Medicare, Medicaid, programmes for all-inclusive care for elderly (PACE), state health insurance assistance program (SHIP), Department of veterans affairs (VAs), and social security administrative programmes (SSA) (*Paying for Long-Term Care*, 2022). Descriptions of the progress is briefly explained in TABLE 4 below.

**TABLE 4.** Descriptions of government programmes in the USA

<b>Program</b>	<b>Descriptions</b>
Medicare	Federal government health insurance programme helps pay some medical costs for people age 65 and older, and for people younger than 65 with certain disabilities and serious health conditions
Medicaid	Combined federal and state programme for low-income people
PACE	Covers medical, social service, and LTC costs
SHIP	Provides one-on-one counselling and assistance with Medicaid, Medicare, and Medicare supplemental insurance
VAs	Provides coverage for LTC at a facility or at home for selected group of veterans i.e. military force, naval and air force
SSA	Provides financial assistance to people with disabilities

Source: *Paying for long-term care*, 2022

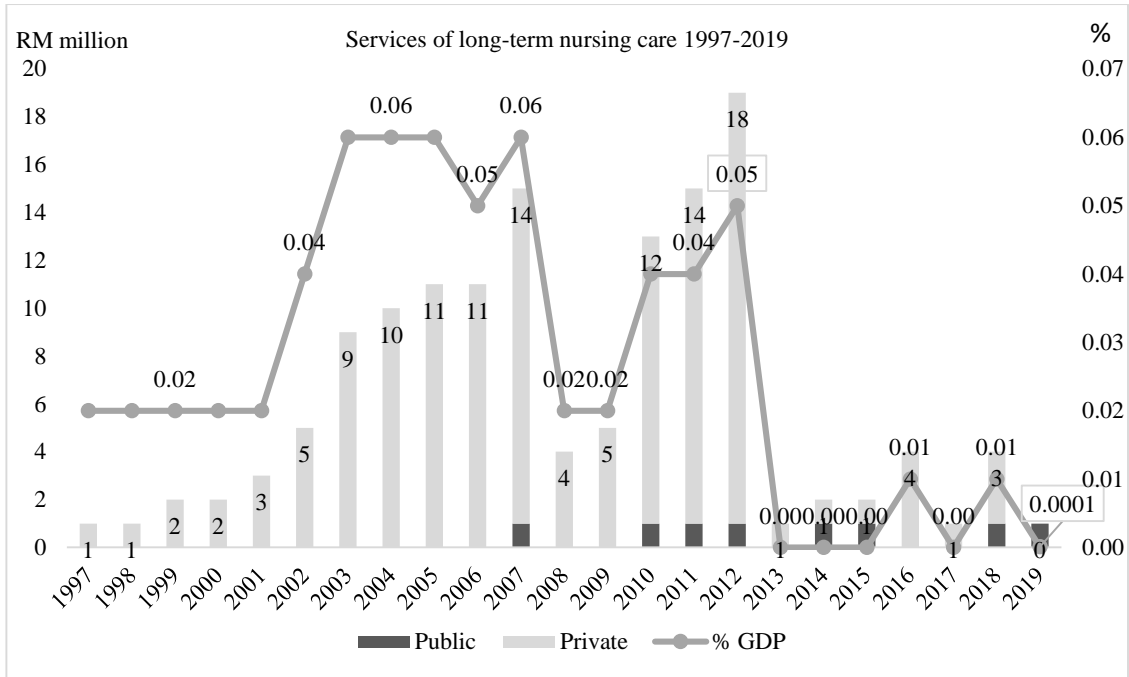
For private arrangement, populace can get coverage in the form of LTCI, reverse mortgages for seniors, life insurance policies for LTC, annuities, and trust (*Paying for Long-Term Care*, 2022). In 2016, 8.3 million elderly received LTC services (Harris-Kojetin L et al., 2019). As a result 17.5% elderly has been covered under the government’s initiative. It is observed that organisation depth in the USA has an established means-tested assessment to ensure minimum social safety net of the elderly. Furthermore, there is an active collaboration between public and private providers in providing the LTC services.

In summary, two areas of improvement that might be considered in Malaysian context, which are: provision of variety of LTC services that cater the needs of each life cycle of the elderly, including preventive care in the LTC systems; and expansion the scope of coverage from hardcore poor to B40 segment with supplemented by the use of established means-tested assessment.

**Cluster 2: Financial Generosity of The LTC Systems**

In Malaysia, sustainability of the LTC expenses can only be funded by government as shown in Source: Health Expenditure Report 2017-2019, 2021

**FIGURE 6** below, where government is consistently provided budget of around RM1 million a year (*Health Expenditure Report 1997-2019*, 2021). However, the amount is very minimal. Due to inconsistent support from private, the LTC expenses, as percentage of GDP in Malaysia has reduced from 0.05% in 2012 to 0.0001% in 2019 (*Health Expenditure Report 1997-2019*, 2021).

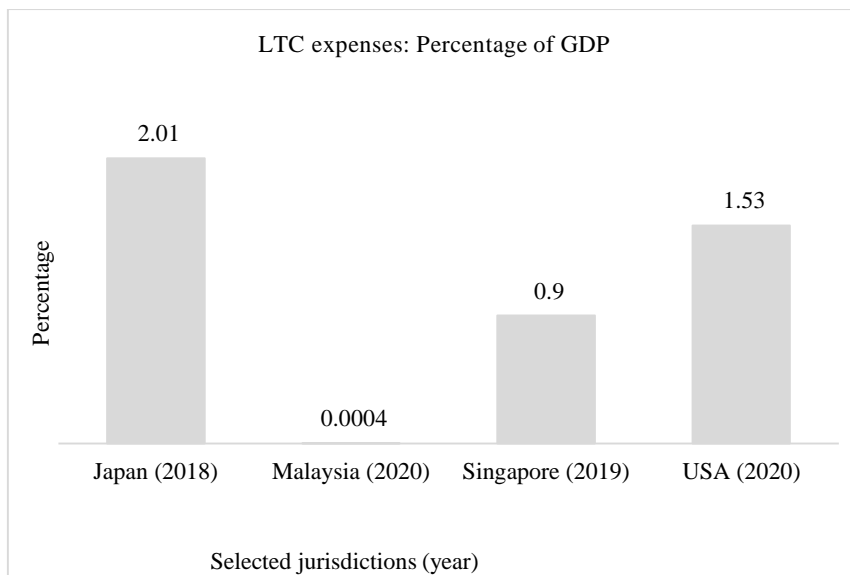


Source: Health Expenditure Report 2017-2019, 2021

**FIGURE 6.** Total expenditure

For comparison, Malaysian LTC expenses is the lowest among the selected jurisdiction as indicated in Source: Kofu Ampaabeng & Liam Sigaud (2022), WHO (2023)

**FIGURE 7,** which is around 0.0004% of GDP in 2020 (*Global Health Expenditure Database, 2023*; Kofi Ampaabeng & Liam Sigaud, 2022). The comparison took latest available year of the data.



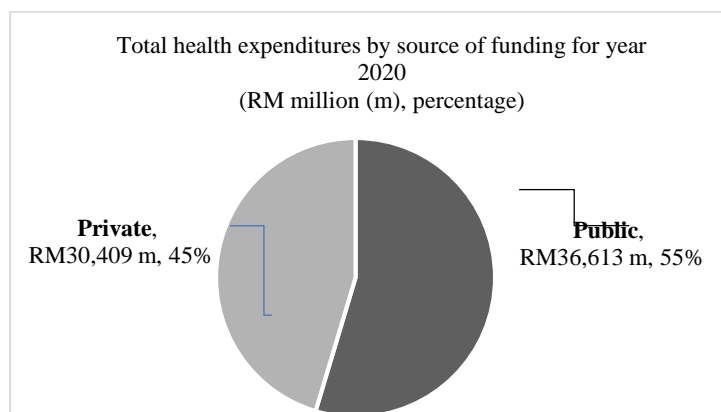
Source: Kofu Ampaabeng & Liam Sigaud (2022), WHO (2023)

**FIGURE 7.** LTC expenses as percentage of GDP, based on latest available data

While there is no specific source of the LTC expenses, government revenue for health expenditures as a whole were mainly came from government, which is RM36.6 billion of 55% of the total expenditure in 2020, as provided in Source: Ministry of Health, 2021



**FIGURE 8** below (*Health Expenditure Report 1997-2019, 2021*).



Source: Ministry of Health, 2021

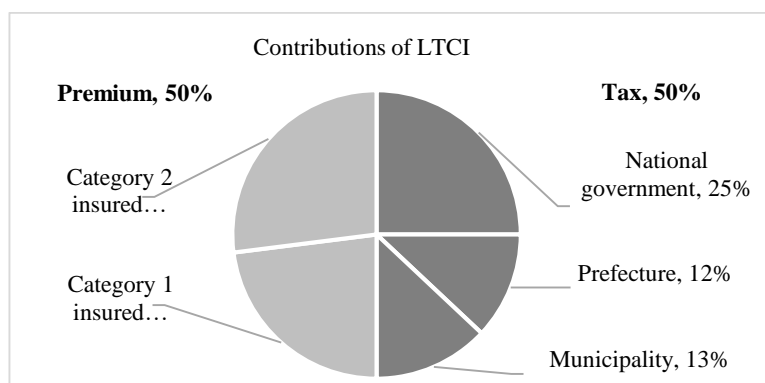
**FIGURE 8.** Total health expenditures by the source of funding for the year 2020

In term of cost-sharing, no payment is required from the elderly since the LTC services is only limited to hardcore poor. The public LTC programmes in Malaysia is fully funded government (Shair & Purcal, 2021).

In Japan, the LTCI is equally funded by the populace and the government (Yamada & Arai, 2020) as displayed in

Source: Yamada & Arai (2020)

**FIGURE 9** below. All person aged 40 and above contribute to the LTCI based on income level and premium is set by municipal government (*Long-Term Care Insurance, 2016*).



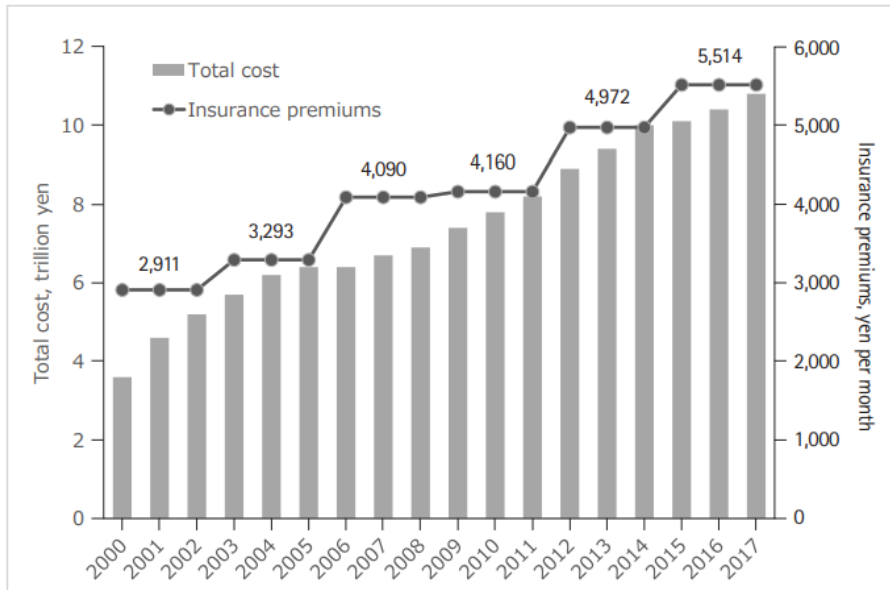
Source: Yamada & Arai (2020)

**FIGURE 9.** Source of LTCI program in Japan

LTCI premium is reviewed every three years started from ¥ 2,911 per month in 2000 to ¥ 5,514 per month in 2017, an increase of 3.8% per annum (Yamada & Arai, 2020). Whereas the cost of LTC increased by 7.1% per annum from ¥ 3.6 trillion in 2000 to ¥ 11.7 trillion in 2019 (Yamada & Arai, 2020). Series of the total premium per month and cost of LTC from 2000 to 2017 as shown in

Source: Yamada & Arai, 2020

**FIGURE 10** below (Yamada & Arai, 2020).



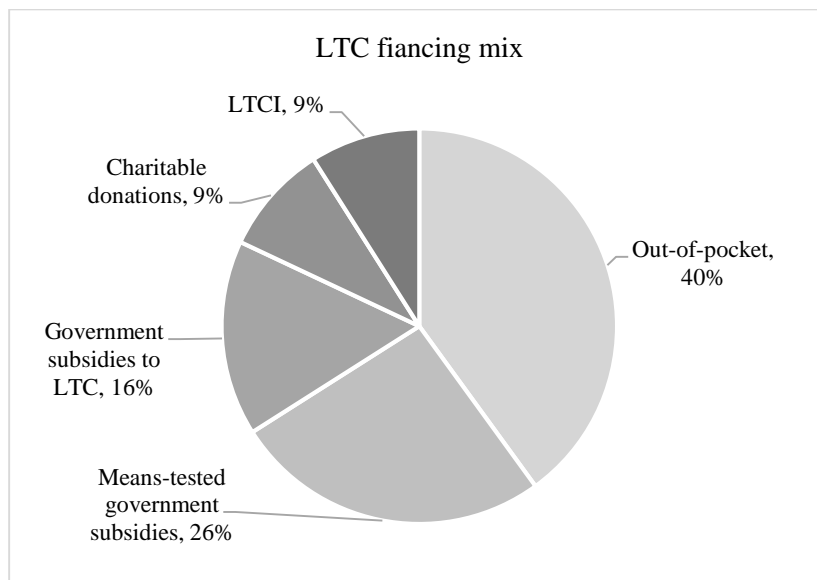
Source: Yamada & Arai, 2020

**FIGURE 10.** Premium per month vs LTC cost from 2000 to 2017

In terms of cost sharing, elderly/family members are required to pay 10% of the LTC services (Centre for Policy on Ageing, 2016).

In the case of Singapore, while no separate LTC expenses has been reported, article titled “Long-term care financing: A tour around the world” (2022), reported that the LTC cost is 0.9% in 2019 (Kofi Ampaabeng & Liam Sigaud, 2022). According to Graham & Bilger (2017), 40% of the LTC expenses is sourced from out-of-pocket money as shown in Source: Graham W & Bilger M (2017)

**FIGURE 11** below. In addition, government funded around 42% of the LTC expenses (Graham & Bilger, 2017).



Source: Graham W & Bilger M (2017)

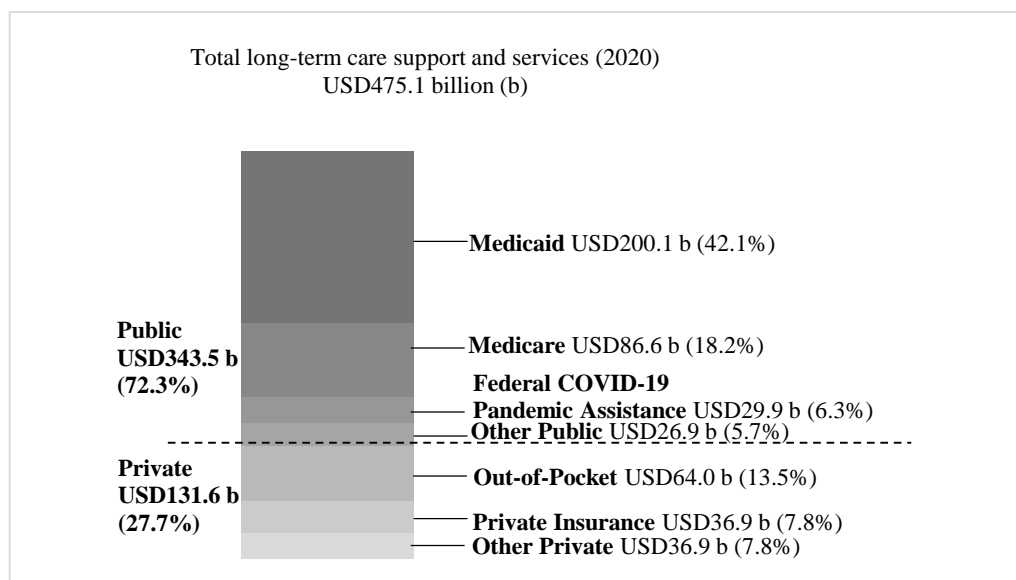
**FIGURE 11.** Estimated LTC financing mix

This concludes that there is a cost-sharing between private and the government. In addition, cost-sharing can be proved via existence of subsidies programme in Singapore like community hospital

sub-acute and rehabilitative services, residential LTC services, non-residential LTC services, community and home-based dialysis services, and caregivers training grants.

In the USA, the LTC expenses are heavily relied on Medicaid and Medicare programmes, which was 50.3% or USD286.7 billion in 2020 as shown in Source: Congressional Research Service, 2022

**FIGURE 12** below (Congressional Research Service, 2022).



Source: Congressional Research Service, 2022

**FIGURE 12.** Long-term services and support (LTSS) in 2020

It is also noted that there is out-of-pocket or cost sharing between the elderly and the government (Congressional Research Service, 2022).

In achieving the policy objectives of the research i.e. to ensure healthy ageing, promote universal and comprehensive protection, and encourage social or community-based care, a mandatory arrangements similar to LTCI in Japan might be used in Malaysian context. However, due to the lack of awareness and affordability, contribution from private arrangement can be changed from populace/employer to corporate entities (in the form of corporate social responsibility).

**Effectiveness of The LTC Systems**

Based on the observation from gaps analysis of the two cluster including organisational depth and financial generosity, the mean for both organisational depth and financial generosity is 5.75. Detailed statistical analysis ais shown in TABLE 5 below.

**TABLE 5.** Descriptive analysis of each variable

	Organi- zation	Mean- tested	Entitle- ment	Cash benefits	Choice of provider	Fina- ncial	financing mechanism	Cost- sharing	LTC expense s
Mean	5.75	1.25	2.00	0.75	1.75	5.75	1.75	1.25	2.75
Standard Error	0.63	0.25	0.41	0.25	0.25	0.85	0.25	0.25	0.85
Median	6	1	2	1	2	6	2	1	3
Mode	6	1	2	1	2	#N/ A	2	1	#N/A

Standard Deviation	1.26	0.50	0.82	0.50	0.50	1.71	0.50	0.50	1.71
Sample Variance	1.58	0.25	0.67	0.25	0.25	2.92	0.25	0.25	2.92
Kurtosis	2.23	4.00	1.50	4.00	4.00	0.34	4.00	4.00	0.34
Skewness	- 1.13	2.00	-	-2.00	-2.00	0.75	-2.00	2.00	0.75
Range	3	1	2	1	1	4	1	1	4
Minimum	4	1	1	-	1	4	1	1	1
Maximum	7	2	3	1	2	8	2	2	5
Sum	23	5	8	3	7	23	7	5	11
Count	4	4	4	4	4	4	4	4	4

In terms of correlation, there is positive relationship between organisational depth and financial generosity with value of 0.89. Based on this result, it can be concluded that when organisational depth is wider the financial generosity is higher. This can be proven when Japan, provide wider coverage for all older people, the financial generosity is higher with the LTC expenses of more than 2% of the GDP per year. Correlation of other variables is shown in TABLE 6 below.

**TABLE 6.** Correlation between variables

	Organi- sation	Mean-tested assessment	Entitl e- ment	Cash benefits	Choice of provider	Finan- cial	financing mechanism	Cost- sharing	LTC expense s
Organization	1.00								
Mean-tested assessment	0.66	1.00							
Entitlement	0.97	0.82	1.00						
Cash benefits	- 0.66	-1.00	-0.82	1.00					
Choice of provider	0.93	0.33	0.82	-0.33	1.00				
Financial	0.89	0.88	0.96	-0.88	0.68	1.00			
Financing mechanism	0.93	0.33	0.82	-0.33	1.00	0.68	1.00		
Cost-sharing	-0.93	- 0.33	-0.82	0.33	-1.00	-0.68	-1.00	1.00	
LTC expenses	0.89	0.88	0.96	-0.88	0.68	1.00	0.68	-0.68	1.00

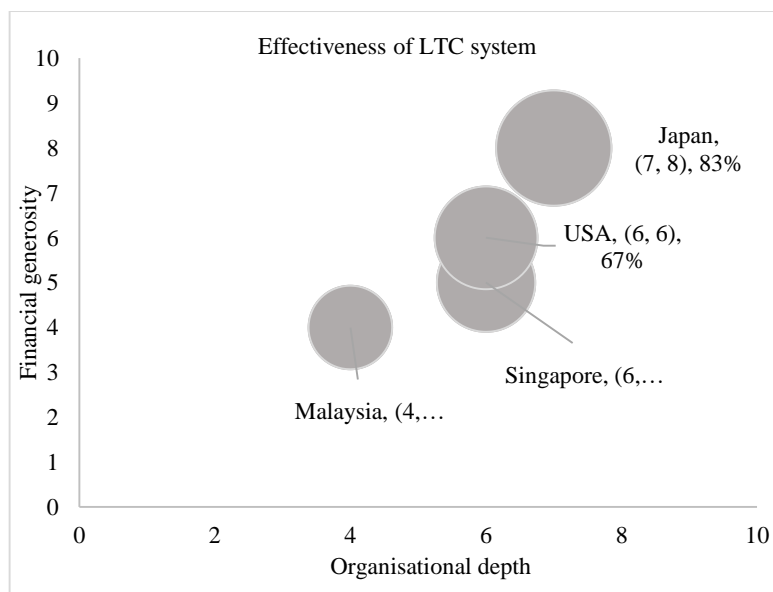
To measure the effectiveness of the LTC system of the selected jurisdiction, summation of organisational depth and financial generosity as defined in equation (3) is used whereas the ordinal scale as populated in TABLE 7 below is derived from equations (1) and (2) based on description in TABLE 1.

**TABLE 7.** Ordinal Scale of organisational depth and financial generosity

	Malaysia	Japan	Singapore	USA	Maximum value
<b>Organization</b>	<b>4</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>9</b>
<i>Means-tested assessment</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>1</i>	<i>2</i>
<i>Entitlement</i>	<i>1</i>	<i>3</i>	<i>2</i>	<i>2</i>	<i>3</i>

<i>Cash benefits</i>	1	0	1	1	2
<i>Choice of provider</i>	1	2	2	2	2
<b>Financial</b>	4	<b>8</b>	<b>5</b>	<b>6</b>	<b>9</b>
<i>Financing mechanism</i>	1	2	2	2	2
<i>Cost-sharing</i>	2	1	1	1	2
<i>LTC expenses</i>	1	5	2	3	5
<b>Total</b>	<b>8</b>	<b>15</b>	<b>11</b>	<b>12</b>	<b>18</b>
<b>Effectiveness (total / max value)</b>	<b>44%</b>	<b>83%</b>	<b>61%</b>	<b>67%</b>	<b>100%</b>

Based on TABLE 7, the most effective LTC systems is Japan, with the effective value of 83% followed by the USA, Singapore and Malaysia. As Malaysian population is rapidly ageing, looking at Japan as a benchmark for LTC definitely will help to improve current policies and practices. Japan has a long established LTCI systems that provides universal coverage for all participants. In addition, looking at Malaysia neighbouring country, Singapore, the effective value is higher that Malaysia and reached more than 50% value. The Singaporean government promotes the concepts of ageing-in-place, which encourages older adults to remain in their homes and communities for as long as possible. The engagement of community contributes to higher value of the *choice of provider* factor than Malaysia indicating that Malaysia can improve the effectiveness of current LTC programmes by widening the service to community level. Similarly, widening the source of *financing mechanism* factor, which include public-private arrangements can also be replicated in Malaysia, so that wider scope of benefits can be provided and reach more participants. The size of the effectiveness can be referred to FIGURE 13.



**FIGURE 13.** Effectiveness of the LTC systems

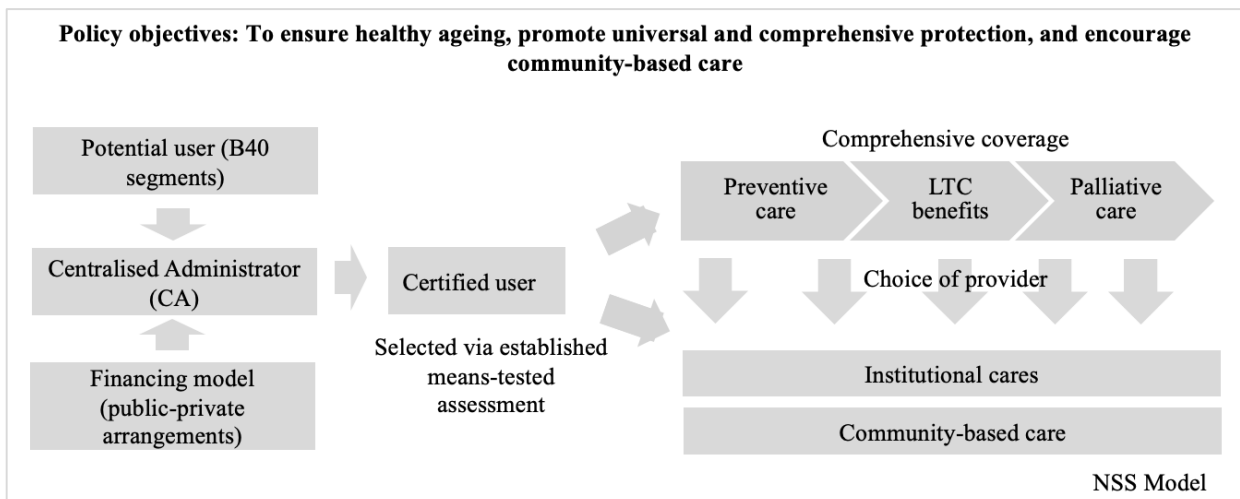
In conclusion, Japan represents the most effective LTC systems with the highest organisational depth and a financial generosity value of 83% of the maximum points. The mandatory LTCI structure with centralized administration implemented in Japan, provide to be an effective system that provides access to all older people. Additionally, effective collaboration between public and private arrangements enable the populace to access a full suite of services that cater the needs of the elderly, from preventive care to LTC benefits. Moreover, recognizing the role of community-based care and acknowledging the role of community/family members in the LTC systems are proven to be the way forward to reduce the government burden. In fact, some jurisdictions, like the USA has enacted laws to include and recognize

the community-based model in their LTC systems. These arrangements can be considered as long-term planning for the optimum policy and structure for LTC systems in Malaysia.

### CONCLUSIONS

In preparing Malaysia towards an aged society by 2040, enhancement to existing LTC systems is required. With the involvement of six different ministries and two departments, the LTC systems in Malaysia creates further complexity as each ministers and departments have different interest and priorities. Furthermore, no single authority is responsible to manage the LTC systems in Malaysia. In addition to the complexity, Malaysia also faces limited resources (infrastructure and capital) to ensure healthy ageing, promote universal and provide comprehensive protection, and encourage social or community-based care. With current capacity of institutional care, it is not possible to achieve the policy objectives. Hence, there is a need to acknowledge and encourage social or community-based care in the LTC systems in Malaysia. Findings from this research also suggested four areas of improvements. The first is the expansion of the scope of recipients. Consideration should be given to the B40 segments to ensure minimum safety net provided to the elderly. To ensure fairness, transparency and inclusive, an established means-tested assessment must be developed. The second suggestion is to expand the benefits covered under the LTC systems. While preventive care is not part of direct LTC, but early recognition of the elderly’s related diseases can reduce the cost of LTC at later stage. These comprehensive coverages require support from community-based care model. The third areas of improvements is the establishment of centralised administrator (CA). The CA can provide dedicated focus and seamless implementation of the LTC systems. Lastly, sustainable financing mechanism that include public-private arrangement shall be developed. While LTCI is proven to be an effective mechanism, but taking into consideration Malaysian context i.e. the awareness, acceptability and affordability of the population, the individual portion of the premium can be sourced from corporates via corporate social responsibility. These areas of improvement can be considered as a starting point for the optimum LTC systems in Malaysia. For better comprehension of the proposals, Source: Author’s suggestion

**FIGURE 14** illustrates the recommendations for an effective LTC systems in Malaysia.



Source: Author’s suggestion

**FIGURE 14.** Potential effective LTC systems in Malaysia

### ACKNOWLEDGEMENT

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## ANALYSIS OF LONG-TERM CARE COSTS IN MALAYSIA: A CASE STUDY FOR PRIVATE INSTITUTIONS

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### ABSTRACT

*Many countries worldwide are fast getting older due to a growing number of elderlies living longer than their ancestors. Older age population commonly associated with an increased risk of disability hence requires supportive healthcare and accessible social services to help them in maintaining their independence and enhance their quality of life. Disabled elderlies constantly depend on care supports from family members to perform activity daily livings (ADLs). While this type of care can be a valuable and meaningful form of support, it does have limitations and may not always be sustainable due to a decline pattern in fertility rates. Hence, formal institutional care becoming more important. This research performs a comprehensive analysis on the costs of long-term care provided by private institutions, based on the type of care services and disability levels Data was collected from Malaysia's registered private/NGO long term care providers through a constructive questionnaires survey. Results show that the types of services provided by most of private institutions include residential home service, short-term stay, home care, daycare, additional services and nursing home. The average cost for each service is varied according to the disability level, namely low dependency, medium dependency and high dependency in which higher dependency implying expensive costs of care. The most expensive type of service is nursing home followed by home care for highly dependent individuals. This study emphasises the importance of implementing an up-to-date long-term care system in order to meet a growing demand from medium to high socioeconomic status elderlies.*

*Keywords: Long-term care, Long-term care costs, Long-term care services, Formal aged care.*

### ABSTRACT

*Kebanyakan negara lain di seluruh dunia, jumlah semakin tua disebabkan peningkatan bilangan warga emas yang hidup lebih lama daripada nenek moyang mereka. Populasi umur yang lebih tua biasanya dikaitkan dengan peningkatan risiko hilang upaya justeru memerlukan penjagaan kesihatan yang menyokong dan perkhidmatan sosial yang boleh diakses untuk membantu mereka dalam mengekalkan kemandirian dan meningkatkan kualiti hidup mereka. Warga emas kurang upaya sentiasa bergantung kepada sokongan penjagaan, daripada ahli keluarga untuk melakukan aktiviti harian (ADL). Walaupun jenis penjagaan ini boleh menjadi bentuk sokongan yang berharga dan bermakna, ia mempunyai had dan mungkin tidak sentiasa mampan disebabkan oleh corak penurunan dalam kadar kesuburan. Oleh itu, penjagaan institusi formal menjadi lebih penting. Penyelidikan ini menjalankan analisis komprehensif mengenai kos penjagaan jangka panjang yang disediakan oleh institusi swasta, berdasarkan jenis perkhidmatan penjagaan dan tahap ketidakupayaan. Data dikumpul daripada penyedia perkhidmatan penjagaan jangka panjang swasta/NGO berdaftar Malaysia melalui tinjauan soal selidik yang membina. Keputusan menunjukkan bahawa jenis perkhidmatan yang disediakan oleh kebanyakan institusi swasta termasuk perkhidmatan rumah kediaman, penginapan jangka pendek, penjagaan di rumah, jagaan harian, perkhidmatan tambahan dan rumah jagaan. Kos purata bagi setiap perkhidmatan adalah berbeza-beza mengikut tahap ketidakupayaan, iaitu pergantungan rendah,*

*pergantungan sederhana dan pergantungan tinggi di mana pergantungan yang lebih tinggi membayangkan kos penjagaan yang mahal. Jenis perkhidmatan yang paling mahal ialah rumah penjagaan diikuti oleh penjagaan di rumah untuk individu yang sangat bergantung. Kajian ini menekankan kepentingan melaksanakan sistem penjagaan jangka panjang yang terkini bagi memenuhi permintaan yang semakin meningkat daripada warga emas berstatus sederhana hingga sosioekonomi tinggi.*

*Kata Kunci: Penjagaan jangka panjang, Kos penjagaan jangka panjang, Perkhidmatan penjagaan jangka panjang, Penjagaan formal warga emas*

## INTRODUCTION

Malaysia, like many other nations across the world, is fast getting older. In the following ten years, the number of old people is expected to grow substantially due to the phenomenon of people living longer. Advances in healthcare, improved living conditions, and better access to medical services have increased life expectancy. Moreover, the total fertility rate (TFR), a measure of the population's fertility trends, has drastically decreased over the years, leading to a smaller number of newborns. These demographic changes affect the old-age dependency ratio (OADR), in which the proportion of elderly people will increase faster than the working-age population, leading to an increase in OADR (World Bank, 2022). The high old-age dependency ratio creates intergenerational equity issues and potential strains on social cohesion. Younger generations bear significant burden in supporting and caring for the elderly, requiring formal support from public and private institutions. For instance the family members need supports in terms of helping the elderlies perform their Activities Daily Living (ADLs) such as eating, dressing, using the restroom, transferring, and feeding and also with Instrumental Activities of Daily Living (IADL) such as cooking, housework, laundry, shopping, or taking medication outside of the home (Hamdy & Yusuf, 2018).

Despite the surging demand from the elderly for formal care supports and long-term care services (LTC), the existing program has not been adequately developed in Malaysia. Moreover, the government has set the eligibility criteria for the public long-term care program. The applicants must be Malaysian who are 60 years old and above, with a household income that does not exceed the poverty line income (PGK) (Department of Social Welfare, 2023). TABLE 1 depicts the distribution of various Malaysian public long-term care programs and facilities by the four main types of service. The government provides cash and in-kind benefits, public aged-care facilities, including residential homes (*Rumah Sri Kenangan*), nursing homes (*Rumah Ehsan*), Home care ("Home Help" program), Respite Care, the Activity Centre for Older Persons (PAWE) and The Senior Citizens Care Unit Programme (UPWE) (Department of Social Welfare, 2023). *Rumah Sri Kenanga* is for seniors to remain in public residential care facilities that offer healthcare supervision and help with ADLs and IADLs (Hamdy & Yusuf, 2018). *Rumah Ehsan* provides nursing care only those with chronic illnesses who require extensive care. Under home care, the "Home Help" services program is a social support service provided by volunteers to the elderly and people with disabilities at home. Respite Care is an alternative program provided by the government for IADL assistance to the guardians or carers who need to temporarily place their elderly parent in a facility for a certain time only due to temporary work outside of their community area or country or due to any other cause. For now, it currently only located at *Rumah Seri Kenangan*, Cheras, Kuala Lumpur. The payment rate is as much as RM 50.00 day /night per person (Department of Social Welfare, 2023). PAWE is a social support program that aims to improve elderly people in the community. There are 143 PAWE centers across Peninsular Malaysia, including Sabah and Sarawak. It entails the ministry working strategically with other governmental agencies and non-governmental organizations (NGOs). Lastly, (UPWE) provides transport services and amenities to elderly individuals who live alone or with families but cannot afford medical treatment in a hospital or clinic (Department of Social Welfare, 2021; Hamdy & Yusuf, 2018).

**TABLE1** Current Malaysia's public long-term care facilities for elderlies

Type of services	Type of facilities and program	Benefits/ Number of facilities	Type of caregiving
Cash and in-kind benefits	Financial assistance	RM500/month	IADL
	Respite Care	1 (Cheras)	
	UPWE	Upon request	
Institutional care	Rumah Seri Kenangan	10	ADL and IADL
Nursing home	Rumah Ehsan	2	
Home care	“Home Help” program	Upon request	IADL
	Activities Programs and		
	Respite Care		
	PAWE		
	UPWE	143	
		Upon request	

Source: Department of Social Welfare (2021)  
Hamdy & Yusuf (2018)

As can be seen in TABLE 1, the public long-term care is still insufficient, and most of the elderly who resided in government facilities were impoverished, with no available relatives to take care of them (Anuar et al., 2019; Shair & Purcal, 2021). Additionally, The existing tax-funded healthcare system is under substantial financial strain and has no systematic or comprehensive LTC provision (Yunus et al., 2022). Limited availability and resources of public long-term making private long-term care institutions a great alternative option for individuals and families who can afford to pay or prefer a higher quality of services. Nonetheless. According to Yunus et al. (2022), For basic care services in a semi-private room, the monthly cost of a private nursing home in Malaysia was found to vary between RM1,200 and RM2,600 and between RM2,650 and RM3,500 for a private room. The information about long-term care costs provided by private institutions is still lacking and not comprehensive. Thus, it is of interest to this research to gathers information about the costs incurred to receive long term care services from private institutions.

## LITERATURE REVIEW

Disabled elderly is highly associated with limitations in performing Activities of Daily Living (ADL) that significantly impact the wellbeing of the elderly (Safian et al., 2021). The most typical indicator of interdependency of care is an individual's ability to carry out ADLs (Holmes, 2021). ADL is a term used to define physical activities such as grooming or personal hygiene, dressing, toileting/continence, transferring/ambulating, and eating (Mlinac & Feng, 2016). Elderlies who are disabled and unable to perform ADLs need assistance and care services to help them maintain their quality of life. These care services involve costs and fees, especially for those seeking private long-term care. A few studies have investigated long-term care costs. The estimation of long-term care cost is based on the level of disability categorized based on ADL classification mild, moderate, and severe (Zeng et al., 2020). The high severity level of disability may result in additional expenditures, including specialized costs, like assistive technology, therapy, personal assistance, and home modifications. In addition, long-term care costs could also be affected by each person's unique experience, including their resources and accessibility of goods and services (Mitra et al., 2017). Often, individuals and their families are not adequately prepared for the high costs of long-term care, which can quickly deplete their savings. Financial planning for long-term care expenses involves understanding the costs, developing a savings plan, and deciding on the best option for care. Nowadays, private institutions have played an important role in providing extensive and various options of care services for those requiring long-term care (De Wolf & Toebes, 2016). However, the service is only for those elderly who can afford the higher fee (Koris et al., 2019). In addition, the cost for each service provided by private care varies. This is because most aged-care providers are not receiving financial help from the government (Md Isa et al., 2022).

To understand long-term care expenses, one first needs to recognize the various kinds of long-term care services offered in the market. According to the National Institute of Aging (2017), there are two types of residential facilities: assisted living and nursing homes. Assisted living is for people who need help with daily care but not as much help as a nursing home provides. This service is offered based on the level of dependency, with residents paying more for higher levels of care (National Institute of Aging, 2017). These services also broaden eligibility and expand coverage to home and community-based services for individuals with less acute care needs. Meanwhile, nursing homes, often known as skilled nursing facilities, offer various medical and personal care services. Compared to most assisted living homes, their services place a greater emphasis on medical treatment. These services often include nursing care, round-the-clock supervision, three meals daily, and support with daily tasks. Additional rehabilitation options are offered, such as physical, occupational, and speech therapy (National Institute of Aging, 2017).

Other than residential facilities, alternative care services are home care which usually includes independent living at home or living independently at home with assistance to improve health and independence (Boland et al., 2017). Home care service, also known as in-house service, assists a person with special needs to remain in their home. It might be intended for elders who are aging in place. It might also apply to those who are disabled, are recovering from surgery, or have a chronic illness (National Library of Medicine, 2021). The price of home care varies. The median hourly cost for home care service in the United States is around \$27 (Kevin, 2022). Meanwhile, home personal care costs approximately RM30 to RM40 per hour in Malaysia (Homeage, 2023). This type of care is categorized as formal care, which is usually more costly than informal care (Goh et al., 2013). Due to experiencing unprecedented population aging, research on long-term care costs is actively carried out to respond to this issue (Fang et al., 2020). Research from Yang et al. (2021) suggested covering home care costs. The government should increase the coverage of these services and make them part of medical insurance. Lu et al. (2017) 's suggested that even though education, urbanization, and healthcare have been improved and contributed to a decline in disability prevalence, the estimations of overall public LTC costs are rising. Moreover, Li et al. (2017) considered the Activity Daily Livings (ADLs) factors in analyzing formal long-term care costs. The results show that age and income significantly predict formal care costs. Xu & Chen (2019) studied the prediction of long-term care costs in China. This study also included the disability level to estimate the cost and found that the TC costs will increase with respect to disability levels, mild, moderate, and severe disabilities.

A study from Kalseth & Halvorsen (2020) investigates healthcare services utilization and cost over the lifespan. Results showed that gender patterns of services consumed affected the care costs. Lagergren et al. (2018) projected the long-term care cost for Japan and Sweden from 2010 to 2040 using log-linear regression was used to project future dependency trends. The data on LTC provision by need and cost for Japan was taken from nine Japanese municipalities collected by assessments in the LTC insurance system. While for Swedish data, the survey in eight municipalities was carried out. Four categories were used in this study to divide up the analysis: population by age group and gender; LTC needs by age group and gender; services given by the level of need; and unit expenses of the services provided. There are two assumptions used in this study. The first assumption is that LTC needs will remain consistent across age groups and genders. The continuation of the current LTC requirement trends through 2025 is considered in the second assumption. The findings show that under the first and second assumptions, this resulted in predicted cost increases of 93% and 80% for Japan.

Japan is the nation with the most significant percentage of elderly in the entire world. The Japanese LTC insurance scheme is one of the world's most comprehensive social care systems (Jin et al., 2022). Nevertheless, the long-term care cost study has still been conducted in Japan to ensure the sustainability of the current program. Due to the widening gap in health equality, Jin et al. (2022), in their study, analyze regional differences in LTC spending and determine the causes. This cross-sectional study was conducted in Japan using publicly available data at the municipality level. The main objective was to determine the per-capita long-term care spending (LTC). This was calculated by dividing the total LTC spending in a municipality by the number of older adults (65 or above) residing there. They performed a linear regression analysis to understand better the factors influencing regional variations in LTC spending, considering various demand, supply, and structural factors. This study utilized the Shapley decomposition approach to assess each independent variable's contribution to the regression model's overall fit. The study found that the percentage of severe care-need level and care level



certification rate was the main contributing factor to long-term care spending exhibited significant regional differences across the 1460 municipalities analyzed. The range of per-capita LTC spending was from 133.1 to 549.9 thousand yen, indicating a maximum-to-minimum ratio of 4.1. This demonstrates considerable variation between different regions. When considering the covariates included in the analysis, they accounted for 84.0% of the total variance in LTC spending. Notably, the demand-related factors had a substantial impact, contributing to over 85.7% of the overall  $R^2$  value. Among these factors, the proportion of severe care-need level and the care level certification rate were found to have the highest influence on LTC spending.

A research from Akemura & Kojima (2018) establishes four scenarios based on the European Commission's Ageing Report (2015) —the base case, high life expectancy, constant disability, and shift to formal care scenarios. The LTC cost was estimated by employing Ueda (2012). The study does not detail the data used; however, it did mention developing long-term projections for long-term care (LTC) costs in Japan utilizes updated data from 2013. The projections are then created by establishing various scenarios based on the European Commission (2015). The result shows that the projection for long-term care costs is a significant increase because both the high life expectancy and shift to formal care scenarios exhibit even more significant increases than the base case scenario. In contrast, long-term costs decrease in the constant disability scenario. Furthermore, the projection findings reveal that Japan is strongly impacted by aging due to the life expectancy scenario exhibiting a more significant increase. In contrast, the constant disability scenario shows more significant limitations.

A study by Harris & Sharma, (2018) estimated the future health and aged care expenditure in Australia with changes in morbidity. This study adopts three assumptions to three simple demographic models. Model 1, the prediction of healthcare expenditure, is calculated by multiplying age and gender-specific per capita healthcare costs. Model 2 applies the assumption of the adjustment to the annual health care expenditure projection for changes in life expectancy. Model 3, The adjustment made for changes in morbidity (whether there is an expansion or compression) in relation to the change in life expectancy is done using a measure of disability-free life expectancy. From model 1, the study found that the health expenditure per elderly individual will rise from \$7,439 in 2015 to \$9,594 in 2035. Additionally, there will be an increase in total health expenditure on the elderly from \$125 billion to \$270 billion. Meanwhile, from model 2, assuming no additional morbidity during the additional years, the study predicts a decrease in health expenditure per elderly individual from \$6,951 to \$5,994. Furthermore, there will be an increase in total health expenditure on the elderly from \$110 billion to \$124 billion, with an average annual growth rate of 0.58%. Lastly, for model 3, considering adjustments for life expectancy and morbidity resulted in a rise in health expenditure per elderly individual from \$7,220 to \$7,719. Additionally, there will be an increase in total health expenditure on the elderly from \$110 billion to \$124 billion, with an average annual growth rate of 0.58%. Moreover, the total health expenditure is expected to increase from \$162 billion in 2015 to \$232 billion in 2035, with an average yearly growth rate of 1.87%. In Thailand, Khongboon (2018) makes a study on estimating long-term care costs for the elderly: A Phichit province case study. This study includes formal and informal care for Thailand's rural and urban areas. The result found that there is not much difference in total annual LTC cost spending between rural and urban residents. Meanwhile, there was a substantial correlation between expenses for informal care, day/night care, and house improvement and the presence of rural residents. It can be said that the total LTC costs do not appear to vary significantly across rural and urban areas.

Estimating long-term care cost and cost-utility to can be a complex area of research in Malaysia. The long-term care facilities were not structured under the same roof. The public long-term care provided by the Malaysian government is for destitute elderlies and is ministered under the Ministry of Women, Family, and Community Development (KPWKM), whereas the private institutions' care is under the Ministry of Health (MoH). Shair & Purcal, (2021) investigated the cost-utility analysis of Malaysian elderlies living in public long-term care institutions. This study analyses the standard of living for Malaysian elders residing in residential care facilities and nursing homes. The result shows that the residential care program is cost-effective, whereas the nursing home for people with severe disabilities is ineffective compared to the proposed QALY range. The study by Yusuf et al. (2018) on measuring awareness of long-term care costs in Malaysia focuses on distinctions between public and private sector employees and between men and women. The study surveyed 450 employees in Malaysia. The findings reveal that dependency and health status significantly impact awareness of preparing for

long-term care costs among employees in different sectors. However, the study found that financial literacy concerning long-term care costs is still at a low level during old age. The long-term care cost from the perspective of providers and caregivers has been conducted by Goh et al. (2013). The study focuses on formal aged-care providers and informal care caregivers' need to spend. A survey was conducted on 31 healthcare providers and 56 informal caregivers for the elderly. From the survey, they analyzed the result in descriptive analysis. The results show that private for-profit care providers generally provide superior facilities and services compared to non-profit centers. Females, particularly daughters, commonly carry out informal caregiving for the elderly. Caregivers typically spend less than USD\$330 on long-term care expenses and heavily rely on public healthcare services. M. Yusuf et al. (2022) indicated that the primary source of financing for long-term care costs is predominantly from the family due to the elderly's retirement savings and pension funds are inadequate to cover the expenses associated with long-term care.

Despite not many studies analyzing the long-term care cost in Malaysia, it shows that the long-term care cost study is increasingly important in Malaysia. The cost of long-term care can be viewed from many perspectives. However, there is a lack of studies conducted to determine long-term care costs in Malaysia that focus on the type of long-term care services provided by private institutions and its associated costs according to disability levels. Therefore, this study estimates the average long-term care cost reflecting the type of services and disability levels. In addition, current public long-term care costs will be compared with private institution costs.

## METHODOLOGY

This research developed a set of questionnaires focusing on collecting long-term care cost data from private institutions. The questionnaires were distributed to 89 private and non-governmental organizations (NGOs) long-term care institutions through email from November 2021 until March 2023 and constantly followed up using phone calls. The list of private and NGO long-term care institutions, was collected from the Department of Social Welfare website. The questionnaires were sent out to 89 aged care institutions, and 10 percent (7 from private institutions and one from (NGOs) responded to the questionnaire and fully answered all questions. We developed the Likert scale questions to make it easy for the respondent to choose the cost based on the services they provided and the dependency level (disability category). The questionnaire developed for this research was adopted based on Xu and Chen (2019 with some adjustments to suit Malaysia's aged-care practice. The questionnaires were divided into several sections as follows:

Section 1: Institutional Profile

Section 2: Long-term Care Services

The institutional profiles include variables such as the name of age care, type of formal care, location, type of care provided, minimum entry age, and the advanced payment (if any). This would provide general information on the aged-care providers in the analysis—the second section is designed to collect information about long-term care services available at the aged-care providers. The description for each service and the level of dependency (disability category) are described within the questionnaire to help respondents understand and make the questionnaire more effective. However, certain information will not be discussed to protect the privacy of research subjects is an obligation for all those involved in the research. This list of services and descriptions has been given in the questionnaire. Residential home/Assisted living, Nursing home/private hospital, home care, short-term stay/respite care/post-op rehabilitation, daycare, additional services (medical, therapy, etc.). Below is described each of the long-term care services provided:

- i) *Residential home/Assisted living*: Provides care for those who want to stay longer and need care and help with Activity Daily Livings (ADLs). The service provides care for independent individuals with low and moderate disability levels.
- ii) *Nursing home/private hospital*: Provides help with custodial care – like bathing, getting dressed, and eating – and skilled care. A registered nurse gives skilled nursing care and includes medical monitoring and treatments. Skilled care also includes services provided by specially trained professionals, such as physical, occupational, and respiratory therapists.

- This provides care for independent individuals who require help with their Activity Daily Living (ADLs).
- iii) *Home care*: Provide care assistance at their home. Home care includes any professional support services that allow a person to live safely in their home. In-home care services can help someone who is aging and needs assistance to live independently; is managing chronic health issues; is recovering from a medical setback, or has special needs or a disability. For home care, there are two types of hours considered; 4 hours for the children who work half day/shift and 8 hours for the children working regular hours 8 hours/day. Lastly, the whole week of care is 5 working days, excluding weekends.
  - iv) *Short-term stay/Respite Care/Post-op Rehabilitation*: A short-term stay that provides physical therapy, occupational therapy, and speech therapy, in addition to 24/7 care. Depending on the patient's needs, this might include access to physicians, care specialists, and more.
  - v) *Daycare*: A professional care setting for older adults who require supervised care during the day or are isolated and lonely.
  - vi) *Additional Services*: The aged care provides alternative services, such as therapists & medical services. Therapists usually provide mental health professionals who consult in LTC facilities and have experienced firsthand the impact of various nonpharmacological therapeutic approaches on individual residents. Meanwhile, the medical service usually provides continuous medical monitoring and timely intervention when medical complications are detected early.

The level of dependency (disability category) categories used in this research include low dependency, medium dependency, and high dependency, as described in TABLE 2 and the explanation below:

**TABLE 2** Level of dependency based on the number of activities daily living unable to perform

Level of dependency (Care level)	Number of activities unable to perform
I (Mild)	3
II (Medium)	4 or 5
II (Severe)	6

Source: Asrulsani & Md Yusuf (2021)

- i) *Low dependency*: Mobile, no wounds, self/assisted feeding, able to manage daily activities with minimal supervision, and mentally stable.
- ii) *Medium dependency*: Wheelchair-bound, mild dementia, grade 1-2 bedsores, needs assistance in daily actives, post-operative care.
- iii) *High dependency*: Dementia on treatment, Ryle's tube feeding, care of invasive tubes, suctioning, oxygen therapy, bedridden, and total nursing care needed.

This study assumes the average cost is calculated under uniform distributions. The average calculation for long-term care and accommodation costs are in formulas 1 and 2. Formula 3 is developed to compare the annual percentage difference between the private institutions of long-term care cost. Next is the calculation for the number of elderly who need long-term care services (residential/assisted living and nursing homes). Assuming that private long-term care services would be for the Top 20% (T20) income group level and the public long-term care services for the Bottom 40% (B40) income group level, the formula is shown in formulas 4 and 5. The prevalence rate data was retrieved from NHMS (2019) Report, and the total number of registered disabled elderlies in Malaysia was retrieved from (Tahir et al., 2022). The extraction of the prevalence data is in TABLE 3.



**TABLE 3** Prevalence of level of difficulty among adults aged 18 years and above in Malaysia

Difficulty by Severity <sup>a</sup>	Prevalence rate (%) <sup>a</sup>	Number of Elderly aged 60+ ('000) <sup>b</sup>	Number of registered disabled elderlies <sup>c</sup>
Some difficulty	25.90		
A lot of difficulty	3.60	3,361.5	72,831
Cannot do at all	0.90		

Source: <sup>a</sup>National Health and Morbidity survey (2019)  
<sup>b</sup>Department of Statistics Malaysia, (2019)  
<sup>c</sup>Tahir et al. (2022)

$$AC_{LTC} = \sum_{i=1}^n X_i / N \text{ fro} \tag{1}$$

$$AC_{Acc} = \sum_{i=1}^n Y_i / N \tag{2}$$

$$PD_{LTC} = \frac{AT_{LTC} - AP_{LTC}}{AP_{LTC}} \times 100 \tag{3}$$

$$NT_{LTC} = PR \times NPD \times 0.2 \tag{4}$$

$$NP_{LTC} = PR \times NoE \times 0.4 \tag{5}$$

Where;

- $AC_{LTC}$  = average cost of long-term care services
- $AC_{Acc}$  = average cost of long-term care accommodation
- $n$  = number of private institutions
- $X_i$  = cost of long-term care services provided by  $i^{th}$  private institutions
- $Y_i$  = cost of accommodation provided by  $i^{th}$  private institutions
- $PD_{LTC}$  = Percentage difference between the private institutions of long-term care cost
- $NT_{LTC}$  = number of elderlies who need private long-term care services
- $AP_{LTC}$  = number of elderlies who need public long-term care services
- $TC_{LTC}$  = total cost of long-term care cost
- $PR$  = prevalence rate of disability
- $NoE$  = number of elderlies (60+)

## RESULT AND DISCUSSION

Statistics of number of respondents are shown in TABLE 4. Based on the survey, the minimum age of participants to enter the aged care is as early as 25 to the latest 60, with RM1275 for advanced payment on average. In addition, the distribution of aged-care locations can be seen in TABLE 5. Most of the institutions were based in Perak. Other institutions were from Johor, Negeri Sembilan, Sabah, and Kuala Lumpur, contributing one aged care from each state.

FIGURE 1, illustrated by a bar chart, shows the type of long-term care services provided by the respondents/ private institutions in Malaysia. The black colour represents the total number of services the private institution provides. In contrast, the grey represents the total number of services that did not provide by the private institution. The graph shows that all eight private institutions provide residential home/assisted living services. Three private institutions provided the service for nursing homes/private hospitals; the other five did not. Meanwhile, six private institutions provide the service for home care services, and the other two do not. For short-term stay/respite care/post-op rehabilitation services, the service is provided by seven private institutions; however, only one private institution does not. For

daycare and additional services, the total number of private institutions that provides the services is the same, given by five, and the total number of private institutions that did not provide the services is 3.

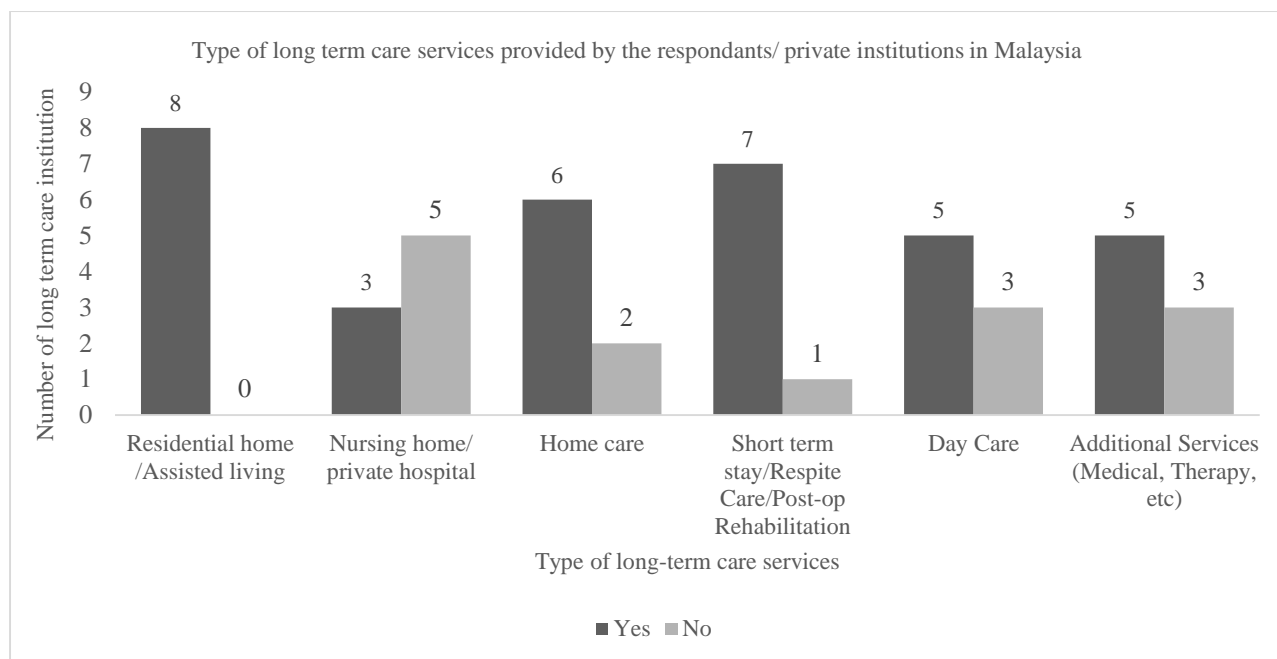
The residential home/assisted living home service can be said as the leading service. As all of the institutions are providing the services, Meanwhile, short-term stay/respite care/post-op rehabilitation services reflect the needs as much as the residential home, reflecting the demand for rehabilitation services continues to increase due to several factors, including a significant epidemiological transition and demographic shift happening globally (Jamison, 2018). Homecare service is reasonable to be the third most provided service because not all aged care can provide this service. This is partly due to a lack of trained personnel in geriatric health care and a lower priority on geriatric care only. The caregivers face excess workload, less salary, peer conflicts, and non-cooperative leadership care (Mafauzy, 2000; Meriam Syed Akil & Abdullah, 2014). Daycare and additional services come to the fourth service with five aged-care. Daycare service is important to help family members who require someone to take care of their disabled elderly while they are working. In general, the purpose of daycare and additional services has similarities where the disabled elderlies require supervision and care during the day by a person or organization. This includes the nonpharmacological therapeutic approaches to individual residents. Meanwhile, the medical service usually provides continuous medical monitoring. These two services can be an alternative to assisted living services, where these services can reduce out-of-pocket medical costs and utilize expensive facilities like emergency rooms. Lastly, nursing homes/private hospitals with only three aged-care provided the service. Like homecare, the well-trained is needed to take care of the elderly. The caregivers face issues such as excess workload, less salary, peer conflicts, and non-cooperative centre leadership, reflecting the lack of this service due to the high staff turnover.

**TABLE 4** General information on Private long-term care

General Information	Details
Number of Institution	7 – Private Institution 1 - NGO
Minimum age	Between 25 – 60 years old
Average advanced payment	RM1275

**TABLE 5** Responses distribution

Location	Respondent
Perak	4
Johor	1
Negeri Sembilan	1
Sabah	1
Kuala Lumpur	1



**FIGURE 1** Type of long-term care services provided by the respondents/ private institutions in Malaysia.

### ANALYSIS OF LONG-TERM CARE COSTS

The study provides analyses of LTC costs in detail according to types of long-term care services and by the level of dependency, which is divided into three sections as follows:

1. Long-term care costs of care by type of service
2. Long-term care costs by types of accommodation—long-term care Cost comparison between Private and public institutions.

#### Long-Term Care Costs by Type of Service

The average cost for each service varies based on month, day, or hours due to different service characteristics. As stated in the methodology section, residential/assisted living, the cost of high dependency was omitted as this service is only for healthy individuals with low and moderate disability levels. Meanwhile, for the nursing homes, the calculation was only for high dependency. For short-term stay/respice care/post-op rehabilitation and additional services, the average cost was calculated based on day, hour, and per service because these services are based on request and schedule.

TABLE 6 shows the average cost (average between all eight institutions) according to types of long-term care services and levels of dependency. The highest cost of long-term care services for low dependency is the 8 hours – of home care (RM 6693.33). The service requires full care services attended at a disabled person's home. Then, the second highest cost is home care (4 hours), followed by residential home/ assisted living and daycare. Meanwhile, for medium dependency, the most expensive long-term care service is 8 hours – of home care (RM10733.33), followed by home care (4 hours), residential home/ assisted living, and daycare. For high dependency, the result still shows that 8 hours – of home care is the most expensive service (RM16066.67), followed by home care (4 hours), nursing home, and daycare. The average costs, regardless of dependency, showed that high dependency has the most expensive care cost with RM4423.28, followed by medium dependency and low dependency with cost prices of RM2897.50 and RM1887.25, respectively. In conclusion, home care with 8 hours of care services a day is the most expensive type of long-term care provided by private institutions in Malaysia, and the costs of this service are substantially higher for high-dependency disabled individuals compared to medium and low-dependency disabled persons.

The average short-term stay/respice care/post-op rehabilitation cost is calculated daily. It can be concluded that the higher the level of dependency, the price is getting expensive. Whereby for low dependency (RM65.30), median dependency (RM75.36), and high dependency (RM104.07). The overall average cost for this service is RM96.79. For additional services, there are two types of costs; the cost of the therapist and the cost of medical services. Both services are based on hours. The result shows the higher the level of dependency, the higher the price. Other than that, the average cost for the therapist is higher than medical services. However, the overall average cost for medical services is slightly higher than the average for the therapist. Lastly, the other additional cost in the category of others, the average cost, is per service provided. This cost is the transportation cost for taking patients to hospitals and clinics. The overall average cost is around RM65.

**TABLE 6** Average care cost based on the type of services and level of dependency

Type of service	Level of dependency			Overall
	Low dependenc y	Medium dependenc y	High dependenc y	
Residential home/ Assisted living/month	1750.06	2625.25	-	2187.66
Nursing home /month	-	-	5000.00	5000.00
Home Care (4 hours) / month	3346.67	5366.67	8033.33	5582.22
Home Care (8 hours)/ month	6693.33	10733.33	16066.67	11164.44
Short-term stay/Respice Care/Post-op Rehabilitation (day)	65.30	75.36	104.07	81.58
Daycare (month)	1255.00	1306.00	1508.00	1356.33
Additional Services - Cost of therapist (hour)	62.75	100.50	125.50	96.25
Additional Services - Cost of medical services (hour)	37.63	75.38	125.38	79.46
Additional Services (Others)	-	-	-	65
<b>Average</b>	1887.25	2897.50	4423.28	

### Costs of Care by Accommodation

TABLE 7 shows the average cost according to the accommodation by the level of dependency. There are three types of accommodation: single beds, 2 beds, and 3 – 4 beds in one room. Single beds can be said as the luxury accommodation provided by the aged-care institution. Residential/assisted living has no cost of high dependency as this service is only for healthy individuals with low and moderate disability levels. On average, medium dependency costs are slightly higher than low dependency by RM41.67 for a single bed, RM291.75 for 2 beds, and 333.38 for 3-4 beds. For the overall average cost, the more restful the accommodation, the more expensive the average cost.

Next is for the nursing home. The nursing home focuses on the treatment of the high dependency level. The results show a similar pattern as residential/assisted living. The more restful the accommodation, the more expensive the average cost, with RM2000.00 for a single bed, RM2500.25 for 2 beds, and RM1416.83 for 3 –4 beds. In contrast, the average overall cost is the same for single beds in nursing homes and residential/assisted living. However, for 2 beds and 3-4 beds, the nursing home is slightly higher compared to residential/assisted living by RM541.75 and RM178.60, respectively.

There's no overall average short-term stay/respice care/post-op rehabilitation cost. The result generally shows the same pattern as residential/assisted living and nursing homes where the accommodation is more restful, the more expensive the average cost. The higher the level of dependency, the higher the cost. The difference in average cost for low dependency is not much different for single beds, 2 beds, and 3-4 beds by RM13 and RM19.97 per day, respectively. Meanwhile, for medium dependency, the difference between a single bed and 2 beds and 3-4 beds is RM7.42 and

RM 27.50, respectively. Lastly, the difference between a single bed's average cost and 2 beds and 3-4 beds for high dependency per day is RM 17.50 and RM20.83, respectively.

**TABLE 7** Average costs for accommodation (RM)

Type of service	Type of Accommodation	Level of dependency			Overall
		Low dependency	Medium dependency	High dependency	
Residential home/ Assisted living (month)	Single bed	2833.50	2875.17	-	3375.25
	2 beds	1500.00	1791.75	-	2333.50
	3 - 4 beds	1416.83	1750.21	-	1571.57
Nursing home (month)	Single bed	-	-	2000.00	3375.25
	2 beds	-	-	2500.25	2875.25
	3 - 4 beds	-	-	1416.83	1750.17
Short-term stay/Respite Care/Post-op Rehabilitation (day)	Single bed	65.10	87.75	121.25	-
	2 beds	52.10	80.33	103.75	-
	3 - 4 beds	45.13	60.25	100.42	-

**Comparison between Malaysian Private and Public Long-Term Care Institutions**

TABLE 8 shows the comparison cost between Malaysian private and public long-term care institutions by the level of dependency on residential homes/ assisted living and nursing homes. The value of annual public long-term care costs is taken from Shair and Purcal (2021). The result shows a vast percentage difference between the annual private and public long-term care costs, with 80.99% for residential homes/ assisted living and 145.18% for residential homes/ assisted living. As mentioned in the methodology section, the number of disabled elderlies in 2019 National Health and Morbidity Survey 2019 (NHMS, 2019). Meanwhile, the estimation of the total cost of the nursing home for private institutions is 128.54% percentage different from the residential home/assisted living.

TABLE 8 also shows the number of elderly who need long-term care services (residential homes/ assisted living and nursing homes). The result indicates that approximately 9916 elderlies are needed for the private residential home/ assisted living care service and approximately 605 elderlies need private nursing home service. As for the public residential home/ Assisted living, approximately 19834 need the services, and approximately 1210 of the elderly need nursing homes. However, to compare the number of disabled elderlies who registered with the total number of disabled elderly who need LTC services (residential homes/ assisted living and nursing homes), the difference is 41267. The remaining number presumably require other services such as short-term stay/respice care/post-op rehabilitation, home care, and daycare. However, with a total number of 153 for all public long-term care facilities (PAWE, Rumah Sri Kenanga, Rumah Ehsan) across Malaysia, it still couldn't accommodate the number of disabled elderlies who need public long-term care services.

**TABLE 8** Comparison between Malaysian private and public long-term care institutions RM)

Type of service	Private LTC	Public LTC	% of difference
	Residential home/ Assisted living	Nursing Home	
Annual cost	26251.92	14,504.00 <sup>a</sup>	80.99%
	60,000.00	24, 472.00 <sup>a</sup>	145.18%
Number of disabled elderly need LTC services.	9916.43	19832.85	
	605.07	1210.14	

Source: <sup>a</sup> Shair & Purcal, (2021)

## DISCUSSION

Long term-care costs are highly associated with types of care services and dependency levels. This research is useful for the government and health policymakers, to understand how long-term care costs vary according to the type of services and dependency level within private institutions environment in Malaysia. The results show that the most common services aged care provide are residential home service, short-term stay, home care, daycare, additional services, and nursing home. The demand for rehabilitation services continues to grow due to factors like a significant epidemiological transition and demographic shift underway globally, able to maximize the effectiveness of various medical and surgical procedures requiring rehabilitation and cater to injury cases (Jamison, 2018). Moreover, this service can accommodate the elderly's needs who not be completely prepared to take care of themselves and require rehabilitation and monitoring from professionals.

In addition, not all long-term care centres provided home care service as this service usually stand-alone service provider that requires professional and well-trained nurses or staff to take care of disabled elderly. The structure of home care services in Malaysia is still under-developed. The home caregivers face issues such as excess workload, less salary, and non-cooperative centre leadership (Md Isa et al., 2022). Thus, home care service providers need support from the government in terms of training for geriatric staffs and initiatives that could encourage private institutions to provide this type of care. As the availability of informal care is shrinking over the years, it is timely for the government to look into this issue attentively. Similarly, although daycare services were not commonly available in private institutions, this type of service would be in high demand because women, the family's main caregiver, were no longer staying at home as statistics showed that female labour force participation rate is increasing over the years. Day care service at institution can help the family members to take care of their elderly parents while they are at workplace. These services also can provide a life balance for the family members between their personal and professional lives and to increase the participation of elderly in society (Drăghici, 2015). The nursing home is the least-provided service. These factors are similar to homecare, where nurses are the lowest-paid employees in the healthcare labour force. This service requires not only professionals but also must be equipped with medical equipment, which not all private aged-care institutions can provide due to the equipment being pricey and not all private aged-care getting government support (Md Isa et al., 2022).

In addition, the service cost by disability level is also different, showing that the higher dependency, the higher the cost needs to be paid. The costs of providing services to people with impairments increase with their level of dependency. This is mainly because people with higher levels of dependency need specialized care, substantial support, and assistance to manage their daily needs and healthcare requirements. Higher levels of dependency frequently signify for more frequent and intensive interventions, including personal care help, medical care, therapies, and equipment. The high cost of care results from these extra resources and services. Higher reliance levels may also necessitate the care of trained specialists or specialized facilities, which can add to the expense. In conclusion, the type of services provided according to the disability level is highly related to the cost. Other than that, the result for accommodation also reflects the current practice where the more restful the service given, the higher the cost respected to the level of dependency.

Other than that, healthcare professionals, policymakers, and researchers can work to develop comprehensive strategies to promote healthy aging, enhance functional abilities, and improve the quality of life for the elderly population by understanding the prevalence, risk factors, assessment tools, interventions, and policy implications related to disability and ADLs. In addition, a thorough evaluation of elderly residents' quality of life in long-term care facilities is necessary to comprehend how aging occurs in various residential settings and how it could affect elderly residents' wellbeing (Shair & Purcal, 2021). The growth of health spending will be directly impacted by aging and level of dependency, but other supply and demand factors are likely to dominate it. The focus on increased efficiency in health production and finance is likely to be more effective in delivering good quality care. The recommendations that can be emphasized to improve the accuracy and representativeness of the study and the survey results are to add more age-care responses. With a larger sample size, the findings will be more comprehensive and also able to reduce the margin of error. Additionally, having a diverse pool of respondents can ensure the study will get a wide range of perspectives and insights.

## CONCLUSIONS

Changes in the demography substantially impact the population's requirement for care. To design appropriate private, public, long-term, and informal care services, knowledge of the distribution of services and prices based on age and gender is essential. A complex combination of biological, behavioural, and social factors will affect the future demand for home and long-term care (LTC) and the costs involved. Long-term care expenditures are crucial for financial planning because they allow people and families to set aside money for future care requirements and consider insurance or saving options. It aids in making well-informed decisions about the kind and length of necessary care. People can choose the best care option based on their financial situation by being aware of the costs involved with various care options. Furthermore, to evaluate affordability and accessibility and to guide conversations about healthcare reforms and funding distribution, politicians and advocacy groups must consider long-term care expenditures. Additionally, this information aids in planning the long-term care system by enabling decision-makers and aged-care providers to foresee future demands, allocate resources effectively, and create fair and sustainable care systems. In the end, having a thorough grasp of long-term care costs equips individuals, families, and other stakeholders with the knowledge they need to make wise decisions, establish effective plans, and guarantee the accessibility and affordability of high-quality care services.

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