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The Malaysian Journal of Business and Economics (MJBE) is intended as a primary publication for theoretical and empirical research or modelling in all areas of business and economics. The aim of the journal is to select contributions that will have high relevance and impact in a wide range of topics in business and economics. We welcome submissions from a range of theoretical and methodological frameworks. All work submitted to the journal should be original in motivation or empirical/theoretical modelling. Every submission to MJBE will be subject to a careful peer-review process.

Editor-in-Chief

CONCEPTUALISING THE POTENTIAL OF DIVERSITY: HOW DIVERSE TEAMS CREATE INNOVATION AND GAIN A COMPETITIVE EDGE

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ABSTRACT

This paper seeks to present a literature review on diversity and inclusion inside organisations regarding innovation. Evidence suggests that diverse teams can tap into various viewpoints to generate significant competitive advantages by enhancing strategic customer relations and market orientation. Unique teams may have challenges in decision-making, but management practices positively influence facts, creativity, and quality work. This paper briefly reviews diversity and inclusion, whereby diversity merely brings in a mix of different people, inclusion effectively uses these diverse groups correctly. The article concludes by pointing out that it is not only the extension of a hand of fellowship to minorities but also the call for them to grasp the chance and positively impact the achievement scores of the organisations.

INTRODUCTION

The pace of modern business requires identified results that contribute advantage and competitive advantage to companies. Indeed, the much-fused concept of competitive advantage is a powerful framework for assessing where diversity management can be understood and applied in business. There are many categories of competitive advantage. They may cover aptitudes or not, cut across the entire business field, or include financial, investment, stakeholder, organisational, marketing and management,

market segments, and positioning. Regardless of the category, competitive advantage always refers to achievers and people pursuing innovative breakthrough performances above and beyond market close locations. These premium results give value over an extended time.

Creative and innovative outputs are vital to any economy and are known by many names, breakthroughs, inventions, leaps forward, alliances, surprises, etc. Innovative companies prioritise having a blend of technical skills and imagination. Obtaining and retaining such outputs is a modern-day challenge involving unleashing marginalised employees' potential. The goal is to harness individuals' diverse talents and qualities for optimum results and value.

Various factors, including functional diversity, organisational identity realms, and external environmental dynamism, alongside control variables such as team goal orientation and task interdependence, may influence the performance of project teams comprising diverse professionals. Additionally, the performance of the business and the success of new product development cannot be overlooked. Stahl and Maznevski (2021) posit that team cultural diversity positively impacts product performance by facilitating a dialogue process, which aids in addressing coexistence problems and enhancing communication, mutual understanding, and adaptation. Furthermore, when organisational cultural diversity bolsters team collaboration, entrepreneurial project teams place greater emphasis on Enhanced Learning Systems (ELS). Multinational companies exhibit broader innovation and likely more tremendous success due to their diverse operations (Corritore et al., 2019). The effect of team cultural diversity on performance may hinge on the level of team interaction and the team's capability to effectively merge different subgroups into productive collaboration, as this promotes the integration of diverse team knowledge

derived from varying social characteristics and experiences of team members (Abarca et al., 2021). Open-minded leadership styles are more conducive to innovation, agility, and success, enabling companies to capitalise on these differences.

Innovation and entrepreneurship highlight the significant role of team diversity in fostering corporate innovation, agility, and swift growth, particularly in multicultural and cross-cultural settings (Stahl & Maznevski, 2021). Diversity orientation enhances organisational, innovation, and product performance and improves communication effectiveness, relational satisfaction, and the dynamic between team diversity and team performance. These aspects influence project turnover, project staff turnover intentions, and new management capabilities. However, contrasting observations have been reported by Frese and colleagues regarding project collaborations in China, leading to a contentious debate.

From both real-life experiences and scholarly research, it is evident that team members with diverse professional identities, skills, experiences, demographics, and cultural backgrounds are more receptive to different thoughts and behaviours. This openness facilitates better social adaptation, innovation capacity, implementation ability, and decision-making capability, ultimately maintaining a competitive edge.

Naseer et al. (2023) demonstrate the existence of the diversity contradiction and the attraction similarity effect, suggesting that these divergent phenomena may be capable of explanation through knowledge of the decision-making process. It presents a contingency theory that suggests the diversity-performance relationship is mediated by variables such as organisational culture. Urionabarrenetxea et al. (2021) introduce a model of interpersonal conflict in multidisciplinary work teams that examines

the relationship between diversity and performance. Their model develops insights regarding the influence of functional and demographic diversity, mediated by organisational culture, leadership, and conflict, on work-group decision quality and performance (Urionabarrenetxea et al., 2021).

Integrating demographic factors of diversity with task, team, and organisational characteristics is necessary for examining diversity-performance relationships, allowing for effective interventions and demonstrable impacts. Previous researchers have identified the effects of various dimensions of diversity and parity on team behaviour and performance but have not always clarified why these relationships exist (Chaudhry et al., 2021).

Many argue that effectively managing diversity can lead to competitive organisational performance. Different approaches to diversity management can impact the bottom line. Yet, the specific interventions needed to maximise the benefits of certain dimensions of diversity are poorly understood, leaving the relationship between diversity dimensions and performance largely unexplored. In modern organisations, diversity is a reality with geographically dispersed teams and dynamic membership. However, little is known about how diversity affects collaboration. Questions remain: Does diversity in teams lead to higher innovation and performance? What team conditions are necessary for diverse team members to be influential? Are these conditions stylistic, demographic, or both? (Inegbedion et al., 2020).

LITERATURE REVIEW

Constructs from disciplines to provide suitable conceptual frameworks for consideration. The need persists for interdisciplinary literature and related discussion across underrepresented interlocutors. Communication requires more than jargon-based rhetoric. Consensus on measuring constructs for robust testing

is necessary. Directions for research in management call for leveraging diversity, not just inclusion. Workforce diversity is grounded in economic and human resource considerations. Legal and regulatory perspectives address the equitable treatment of employees. Micro and macro levels influence motivation and competitive advantage. Discussions on diversity in literature are inadequate. Understanding potential impacts is still in the nascent stages of development (Urbancová et al., 2020; Yadav & Lenka, 2020).

Empirical evidence has been inconsistent, possibly due to conceptual and methodological reasons (Hongal & Kinange, 2020). Recent research on organisational diversity suggests that a diverse workplace can positively affect processes, employee commitment, and productivity. However, there is evidence that workforce diversity can create barriers and hinder job performance. Paying attention to diversity could benefit organisations with increased satisfaction and innovation. Earlier studies on affirmative action influenced the understanding of diversity, but recent findings often contradict them. Collective intelligence of a group, which is influenced by the diversity of its members is a significant predictor of the team's ability to perform innovative tasks. Past research shows that diverse teams have more potential to innovate than homogenous teams (Inegbedion et al., 2020; Chaudhry et al., 2021).

Workforce diversity has internal strengths, including capacity for change and improved strategic decision-making. Diverse representation brings alternative viewpoints and enhances group decision-making. It leads to quicker, higher-quality decisions and more innovative problem-solving (Ramamurthy, 2019; Köchling & Wehner, 2020). Recent studies provide the theoretical foundation for studying the effects of workforce diversity. Diversity of thought allows firms to adapt quickly. Recommendations include building a complex cognitive system, providing inclusive

structures, leading from the bottom, working towards a shared vision, and prioritising essential matters.

Diversity

Women makeup over 50% of the population, possess more college degrees, and represent 50% of the workforce. Yet, they earn less than men and often bear the financial burden of college and student loan debt. Many women are the sole providers for their households. Gender-biased conflicts should not hinder professional development and equity. Efforts have been made to address gender inequities, but attitudes can still evolve. An individual's value, accomplishment, or success should not be determined by their sexual orientation, sexuality, or gender identity (Quintana-García & Benavides-Velasco, 2016; Sahama et al., 2021). Diverse teams consist of individuals from different backgrounds, bringing innovation and growth potential. This part focuses on identity and demographic diversity, including gender, age, race, ethnicity, and sexual orientation. We also address the diversity of thought separately. Diversity, Equity and Inclusion (DEI) are crucial for cultural change at work, requiring ongoing commitment rather than a checklist (Wiig & O'Hara, 2021).

Fostering a culture of continuous learning and adaptation by age diversity brings a mix of experience and clear perceptions. Studies have shown that these teams can address the needs of a broad customer base and lead innovation through varied viewpoints (Xu, 2019).

The workplace with varied cultural insights is enriched by racial and ethnic diversity. Research by Olcoñ et al. (2019) highlights that groups with diverse racial and ethnic backgrounds are more likely to generate creative solutions and succeed with superior results to homogenous groups.

RESEARCH OBJECTIVE

To examine conceptualization on the potential workforce diversity on innovation and competitive advantage in modern organizations, focusing on the influence of team heterogeneity across demographic, functional, and cultural dimensions on team performance, creativity, and decision-making quality.

CONCEPT DERIVED FOR WORKFORCE DIVERSITY AND ORGANIZATIONAL PERFORMANCE

1. The Independent Variable is Workforce Diversity. The dimensions of diversity is measured using demographic diversity (gender, age, ethnicity, nationality), functional diversity (professional background, skills, expertise) and cultural diversity (values, beliefs, norms).
2. The Dependent Variables
 - a. Innovation measured by creative output, number of patents, new product development success, etc.
 - b. Competitive Advantage measured by market positioning, financial performance, and long-term sustainability.
 - c. Team Performance measured by efficiency, quality of decision-making, and adaptability in dynamic environments.
3. The Mediating Variables comprise of the following
 - a. Team Collaboration and Integration that facilitates knowledge-sharing, mutual understanding, and cohesive work processes.
 - b. Organizational Culture refers to the culture that values inclusion, equity, and openness to different perspectives can strengthen the positive effects of diversity.
 - c. Enhanced Learning Systems (ELS) provides resources and processes that support continuous learning, fostering innovative outcomes.

4. The Moderating Variables derived from the literature review is as follows:
 - a. Leadership Style refers to open-minded and inclusive leadership can amplify the positive impacts of diversity on team dynamics.
 - b. Environmental Dynamism stresses on the external environment's stability or unpredictability can influence how well diversity translates into competitive advantage.
 - c. Team Goal Orientation and Task Interdependence refers to the teams with aligned goals and high task interdependence may benefit more from diversity by encouraging collaboration and shared accountability.
5. The Control Variables chosen would be
 - a. Organizational Size and Structure that differences in size and hierarchy may affect how diversity is managed and its impact on innovation.
 - b. Industry Type includes industries with high innovation demands (e.g., tech, R&D) might experience stronger diversity effects compared to more traditional industries.

Framework Flow

Workforce Diversity (Demographic, Functional, Cultural) → Mediated by Team Collaboration, Organizational Culture, Enhanced Learning Systems (ELS) → Moderated by Leadership Style, Environmental Dynamism, Team Goal Orientation → Leads to Innovation, Competitive Advantage, and Team Performance

SIGNIFICANCE OF THE STUDY

On June 29, 2007, the Securities and Exchange Commission (SEC) voted to allow the New York Stock Exchange (NYSE) to make permanent a rule requiring listed companies to disclose on an annual basis information about their boards of directors, director independence, and member diversity. Results from our models of the effect of racial diversity on the value created

of market share during the commercialisation process show the proportion of African-American and Hispanic team members to have significant, positive effects, which is consistent with our proposition that racial diversity can enhance other organisational capabilities and increase chances for competitive advantage. While we cannot rule out the possibility that the relationship between the racial diversity of teams and the value created by awarded patents could be U-shaped, we explored other possibilities (Quintana-García and Benavides-Velasco, 2016).

While we may easily link diversity and innovation, the translation of those innovative contributions into a competitive advantage has yet to be demonstrated. Findings about the influence of diversity on corporate culture and performance suggest that attention must be paid to critical intervening or moderating variables that can enhance or diminish the potential positive outcomes to firm performance. Quintana-García and Benavides-Velasco (2016) explore the relationships between the composition of racial diversity of teams and the market value of awarded patents in one of the first studies in this area. Their results support the claim of the value of racial diversity for innovation and, ultimately, competitive advantage but also suggest that these relationships are neither automatic nor unrestricted.

Does competition change diversity's relationship with innovation and competitive advantage? High diversity in teams might lessen the impact of diversity on innovation. The effect of representation on perceived texture is also essential (Usher & Barak, 2020). Research should investigate the impact of diversity representation on innovation in small and more significant teams. Incentives and process tweaks can mitigate the negative consequences of more extensive diversity commitments (Usher & Barak, 2020).

We asked which scenario is more likely

to generate the direct effect: HR policies attracting a more substantial pool of applicants or a talent management process utilising the knowledge found in a diverse workforce. HR policies and high-value information are factors of an innovation-based approach. The study sheds light on team innovation and competitive advantage (Funmilayo Aribidesi Ajayi & Chioma Ann Udeh, 2024). Motivation and a diverse workforce differentiate innovative firms. Heterogeneous team members bring personal knowledge and experiences, stimulating creativity. Diversity causes team innovation. We questioned if there is more than a direct effect of team heterogeneity on team innovation (Funmilayo Aribidesi Ajayi & Chioma Ann Udeh, 2024).

CONCLUSION

The relationship between visible diversity and individual contribution in teams shows consistent evidence. Greater diversity of education encourages engagement and substantial contribution from team members. This challenges the social loafer problem often mentioned in the literature. However, the impact of visible diversity on team performance is mixed, while diversity has a positive effect on individuals. The paper then focuses on the project context and the variables analysed. The research findings suggest that visible diversity can positively contribute to team performance but can also make communication and interaction more challenging. Overall, there is partial evidence that more diverse teams are innovative and of higher quality. Multinational corporations benefit from diverse national backgrounds among employees. Law firms and professional service organisations with cultural expertise have a competitive advantage. Diversity is essential for creativity and morale. Research shows promising benefits. Our study contributes to this field. Diverse teams foster innovation with varied perspectives. Homogeneous teams may struggle with creative problem-solving.

REFERENCES

- Abarca, V. G., Sanchez, P. P., & Camacho, M. A. (2021). Virtual Teams in Times of Pandemic: Factors That Influence Performance. *Frontiers in Psychology*, 12(12). Frontiersin. <https://doi.org/10.3389/fpsyg.2021.624637>.
- Ashikali, T., Groeneveld, S., & Kuipers, B. (2020). The Role of Inclusive Leadership in Supporting an Inclusive Climate in Diverse Public Sector Teams. *Review of Public Personnel Administration*, 41(3), 0734371X1989972. Sagepub. <https://doi.org/10.1177/0734371X19899722>.
- Chaudhry, I. S., Paquibut, R. Y., & Tunio, M. N. (2021). Do workforce diversity, inclusion practices, & organisational characteristics contribute to organisational innovation? Evidence from the U.A.E. *Cogent Business & Management*, 8(1), 1–24. <https://www.tandfonline.com/doi/full/10.1080/23311975.2021.1947549>.
- Corritore, M., Goldberg, A., & Srivastava, S. B. (2019). Duality in Diversity: How Intrapersonal and Interpersonal Cultural Heterogeneity Relate to Firm Performance. *Administrative Science Quarterly*, 65(2), 000183921984417. <https://doi.org/10.1177/0001839219844175>.
- Funmilayo Aribidesi Ajayi, & Chioma Ann Udeh. (2024). Innovative recruitment strategies in the IT sector: A review of successes and failures. *Magna Scientia Advanced Research and Reviews*, 10(2), 150–165. <https://doi.org/10.30574/msarr.2024.10.2.0057>.
- Hongal, P., & Kinange, U. (2020). A Study on Talent Management and its Impact on Organisation Performance- An Empirical Review. *International Journal of Engineering and Management Research*, 10(01), 64–71. <https://doi.org/10.31033/ijemr.10.1.12>.
- Inegbedion, H., Sunday, E., Asaleye, A., Lawal, A., & Adebajji, A. (2020). Managing diversity for organisational efficiency. *SAGE Open*, 10(1), 1–10. Sagepub. <https://doi.org/10.1177/2158244019900173>.
- Köchling, A., & Wehner, M. C. (2020). Discriminated by an algorithm: a systematic review of discrimination and fairness by algorithmic decision-making in the context of HR recruitment and HR development. *Business Research*, 13(3), 795–848. <https://link.springer.com/article/10.1007/s40685-020-00134-w>.
- Naseer, S., Bouckenoghe, D., Syed, F., & Haider, A. (2023). Power of inclusive leadership: Exploring the mediating role of identity-related processes and conditional effects of synergy

- diversity climate in nurturing positive employee behaviors. *Journal of Management & Organisation*, 1–22. <https://doi.org/10.1017/jmo.2023.37>.
- Olcoñ, K., Gilbert, D. J., & Pulliam, R. M. (2019). Teaching About Racial and Ethnic Diversity in Social Work Education: A Systematic Review. *Journal of Social Work Education*, 56(2), 1–23. <https://doi.org/10.1080/10437797.2019.1656578>.
- Quintana-García, C., & Benavides-Velasco, C. A. (2016). Gender Diversity in Top Management Teams and Innovation Capabilities: The Initial Public Offerings of Biotechnology Firms. *Long Range Planning*, 49(4), 507–518. <https://doi.org/10.1016/j.lrp.2015.08.005>.
- Ramamurthy, A. (2019). Follow a Data-Driven Road Map for Enterprise Decision-Making. *Journal - American Water Works Association*, 111(6), 78–81. <https://doi.org/10.1002/awwa.1311>.
- Sahama, I., Wyeth, S., & Pojani, D. (2021). Gender bias in the planning industry and planning outcomes. *Australian Planner*, 1–11. <https://doi.org/10.1080/07293682.2021.2017994>.
- Stahl, G. K., & Maznevski, M. L. (2021). Unraveling the effects of cultural diversity in teams: A retrospective of research on multicultural work groups and an agenda for future research. *Journal of International Business Studies*, 52(1), 4–22. Springer. <https://doi.org/10.1057/s41267-020-00389-9>.
- Urbancová, H., Hudáková, M., & Fajčíková, A. (2020). Diversity Management as a Tool of Sustainability of Competitive Advantage. *Sustainability*, 12(12), 5020. <https://doi.org/10.3390/su12125020>.
- Urionabarrenetxea, S., Fernández-Sainz, A., & García-Merino, J.-D. (2021). Team diversity and performance in management students: Towards an integrated model. *The International Journal of Management Education*, 19(2), 100478. sciencedirect. <https://doi.org/10.1016/j.ijme.2021.100478>.
- Usher, M., & Barak, M. (2020). Team diversity as a predictor of innovation in team projects of face-to-face and online learners. *Computers & Education*, 144, 103702. <https://doi.org/10.1016/j.compedu.2019.103702>.
- van der Waltd, G. (2020). Constructing conceptual frameworks in social science research. *The Journal for Transdisciplinary Research in Southern Africa*, 16(1). <https://doi.org/10.4102/td.v16i1.758>.
- Wiig, S., & O'Hara, J. K. (2021). Resilient and responsive healthcare services and systems: Challenges and opportunities in a changing world. *BMC Health Services Research*, 21(1). <https://doi.org/10.1186/s12913-021-07087-8>.
- Xu, F. (2019). How and When Does Age Diversity Promote Firm Performance? The Mediation of Diversity Management and Employees' Participation in Decision Making and the Moderation of Diversity Legitimacy Logic. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3454089>.
- Yadav, S., & Lenka, U. (2020). Workforce diversity: from a literature review to future research agenda. *Journal of Indian Business Research, ahead-of-print(ahead-of-print)*. <https://doi.org/10.1108/jibr-08-2019-0243>.

THE INFLUENCE OF COMPANY SIZE AND PROFITABILITY ON CARBON ACCOUNTING INFORMATION DISCLOSURE: EVIDENCE FROM THE SHANGHAI A-SHARE HEAVILY POLLUTING INDUSTRIES

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ABSTRACT

In this study, the relationship among firm size, profitability, and carbon accounting information disclosure (CAID) of 131 highly polluting Shanghai A-share listed companies was analysed using a multivariate regression approach based on the stakeholder theory. The results revealed that larger and more profitable companies were more transparent in disclosing carbon accounting information, which aligned with stakeholder expectations. This study enhanced the comprehension of the interplay between company characteristics and CAID dynamics and emphasised its pivotal role in fostering sustainability and transparency. The insights are valuable for policymakers, industry experts, and stakeholders and guide environmentally responsible business practices.

INTRODUCTION

Implementing the International Financial Reporting Standards (IFRS) S1 and S2 increased focus on organisational carbon emissions, sustainability policies, and related risks and possibilities. The IFRS S1 emphasises the disclosure of sustainability-related risks and opportunities, whereas IFRS S2 concentrating on disclosing climate-related risks and opportunities (Avi, 2022). Globally, stakeholders DOI:10.47191/jefms/v5-i4-11 pressure companies to increase their accountability, specifically regarding social and environmental issues (Pasko et al., 2021).

The Carbon Disclosure Project (CDP) is the leading international platform for carbon accounting information disclosure (CAID), aiming to establish uniform reporting protocols for companies' climate-related activities. It supplements annual financial reports by providing investors with information on global warming-associated business risks and opportunities. Unlike carbon financial accounting, CDP reports cover various climate-related activities, such as measuring emissions, preparing organizations, investing in technology, trading, and offsetting. Carbon accounting is a specialized process involving the measurement and quantification of emissions within legal frameworks (Kolk et al., 2008). In 2021, the CDP disclosed environmental data from 13,000 enterprises, representing 64% of the global market value—a 35% increase from 2020 and a 141% rise since the Paris Agreement in 2015 (CDP, 2021). Specifically, CDP revealed carbon accounting information for 2,000 companies in China, a 43% increase from 2020, surpassing the global growth rate. Xiong (2015) highlighted CAID level variations across Chinese industries, particularly in heavily polluting sectors facing stricter regulations and higher penalties. These industries, characterized by high energy consumption and emissions, encounter challenges in reducing their environmental impact, with some prioritizing economic growth over environmental protection and experiencing weak regulation enforcement (Ou & Jiang, 2023).

Considering the challenges involved, comprehending the elements that affect the CAID of heavily polluting Chinese enterprises is important. Although there are various factors influence organisational CAID, size and profitability levels maybe crucial. Faisal et al. (2018) discovered that larger, more profitable, and lower-leverage companies are more motivated to disclose carbon accounting information to stakeholders. Among the ASEAN countries, Asif (2021) reported that governance, industry characteristics,

organisational efficiency, operational size, and transparency levels substantially influence CAID. Liu (2018) and Yang (2022) have found and highlighted the importance of company size and profitability, revealing their critical role in shaping organisational CAID behaviour. These findings provided important clues for a deeper understanding and interpretation of corporate environmental disclosure behaviour. In enhancing the understanding and provide insights into how heavily polluting industries can improve environmental performance, this study aimed to integrate stakeholder theory organically with the IFRS S1 and S2 guiding principles. This comprehensive investigation aimed to provide companies with a more refined and practical blueprint for CAID implementation.

LITERATURE REVIEW AND HYPOTHESIS

The stakeholder theory recently gained significant attention as it highlights the importance of businesses considering the effect of their actions on stakeholders. Organisations are expected to be accountable to their shareholders and other stakeholders, such as employees, customers, suppliers, the environment, and society (Freeman, 2010). An increased company size involves more stakeholders, which increases the importance of meeting their disclosure requirements, such as CAID.

Empirical studies consistently demonstrated a statistically significant positive correlation between company size and the CAID level. Zhao and Yan (2014) studied the listed companies in heavily polluting industries and reported that company size significantly affected the CAID. Similarly, Gao (2014) examined publicly listed manufacturing organisations and reported a noteworthy and positive association between company size and CAID. Faisal et al. (2018) examined the factors that influence CAID by analysing the annual reports of 37 publicly traded businesses in Indonesia from 2011 to 2014. The findings indicated that organisations that are large and

extremely lucrative, while also low-leverage, are strongly motivated to provide carbon-related information to their stakeholders. Furthermore, Ika et al. (2022) and Yu et al. (2020) reported that firm size and profitability were positively related to CAID.

A growing company will likely involve more stakeholders, which increases the organisational CAID disclosure requirements. Organisational stakeholders significantly influence the development of organisational sustainability practices. Profit-seeking shareholders may prioritise short-term financial returns over long-term sustainability goals. Nevertheless, as more investors become socially responsible, they are increasingly interested in the organisational environmental and social impact. This interest could encourage companies to disclose more information about their carbon accounting practices (Zumente & Bistrova, 2021).

Highly profitable firms are more dependable when managing public affairs, such as environmental issues or social donations, which align better with social norms and legitimacy requirements (Gamerschlag et al., 2011; Yang, 2022; and Yu et al., 2020) identified a significant positive correlation between profitability and CAID. Nonetheless, the effect of profitability on CAID is debatable. Gao (2014) and Chen (2018) reported a negative correlation between profitability and CAID. Furthermore, Kholmi et al. (2020) determined that profitability negatively affected carbon emission disclosure in Indonesia. Nevertheless, Ma (2015), Larasati et al. (2020), and Larasati et al. (2020) reported that the profitability variable did not significantly affect CAID.

METHODOLOGY

Given the increased government oversight and societal focus on significantly polluting industries, the research sample in this study was corporations in such industries. In this study, 20 industries were screened from the

industry codes according to the relevant regulations of the China Securities Regulatory Commission and the State Environmental Protection Administration¹. Cross-sectional data from all A-share listed businesses in the heavily polluting sector covering 2021 were used. Yearly data were used, and the original sample was screened according to the following criteria to guarantee the dependability and accuracy of the findings:

- (1) Companies in the heavily polluting industry were selected from the industry codes of listed companies.
- (2) The ST², SST³, ST⁴, and PT⁵ companies were excluded.
- (3) Companies with missing or abnormal values for relevant variables were excluded.

Stratified sampling was used to ensure a representative and unbiased sample by partitioning the population into multiple strata based on similar attributes, with samples randomly selected from each stratum. The study population consisted of 513 companies, and a sample size of 129 valid samples was determined using G-Power software. After applying the stratified sampling method, the final sample size was adjusted to 131, maintaining a ratio of 129/513 (25.15%). The heavily polluting industries were divided into 20 strata to capture industry variations

1 The Guidelines for Environmental Information Disclosure of Listed Companies (Draft for Comments) issued by the Ministry of Environmental Protection on September 14, 2010, state that 16 industries (thermal power, iron and steel, cement, electrolytic aluminium, coal, metallurgy, chemicals, petrochemicals, building materials, papermaking, brewing, pharmaceuticals, fermentation, textiles, tanning, and mining) are heavily polluting industries.

2 ST: Special treatment: Companies that experience consecutive annual losses receive preferential treatment.

3 SST: Companies experiencing consecutive yearly losses are subject to special treatment and have not implemented stock reform.

4 ST: Companies that experience financial losses for three consecutive years are issued a warning regarding delisting.

5 PT: Particular transfer: Stocks awaiting delisting undergo trading suspension and their prices are reset to zero.

effectively, with SPSS facilitating sample selection at a 25% ratio. Despite aiming for a 25% proportion, some discrepancies arose due to practical adjustments during the study, introducing sampling bias. These discrepancies are discussed in detail in the Discussion section, where suggestions for future research design improvements are provided.

Table 1: Definitions of the Variables and Data Sources

Variable	Description	Document Type	Data Source	Data Selection or Processing Method
Independent	Company size; Profitability	Annual report	CSMAR database	Relevant CSMAR data selected and exported based on company codes
Dependent	CAID	Annual report Sustainability report ESG report	WIND, CNINFO website, official company website	CAID-related content identified and coded using content analysis of collected reports

Variables Definition and Modelling

CAID: This study developed the CAID evaluation system and checklist using the approaches of Shen, Zheng, Adams and Jaggi (2020), Fan (2021), Choi, Lee and Psaros (2013), and Utami (2022). Initially, carbon information was categorised into non-monetary CAID (CAIDNM) and monetary CAID (CAIDM) based on whether they involved specific monetary funds. Guided by Fan (2021), the sampled companies were scored using a content analysis method. The analysis established five primary indicators (carbon reduction goals and strategies, carbon reduction management, carbon emission accounting, carbon reduction performance, capital investment and returns) and 10 secondary indicators.

The CDP Information Request sheets were analysed by referencing Choi et al. (2013) and Utami (2022). The analysis identified five major categories related to climate change and carbon emissions: climate change risks and opportunities (CC), greenhouse

gas emissions accounting (GHG), energy consumption accounting (EC), greenhouse gas reduction (RC), and cost and carbon emission accountability (ACC). Eighteen key items within these categories were selected with Fan's (2021) scoring table. All items were assigned equal weight to ensure a fair evaluation. Companies achieved a maximum score of 18 when they fully disclosed information on all 18 environmental items.

Company Size: Company size is crucial in disclosure policy research (Foster, 1986). It can be measured by sales revenue, total assets, and market value. Total assets, which reflect a company's internal control responsibilities, are less affected by market changes (Yan, 2014). This study used the logarithm of year-end total assets for empirical research, referencing Li et al. (2018). Accordingly, Hypothesis 1 was proposed.

Hypothesis 1: Company size is positively correlated with the CAID level.

Table 2: CAID Scoring Criteria Checklist

Category	Primary Indicator	Secondary Indicator	Score	Explanation
CAIDNM	Carbon reduction goals and strategies (1/2)	(1) Carbon reduction goals	0, 1	1 point if there are carbon reduction goals; otherwise, 0 points.
		(2) Carbon reduction strategies	0, 1	1 point if there are carbon reduction strategies; otherwise, 0 points.
	Carbon reduction management (3/4/5/6)	(3) ACC1: Indicates which board committee (or other executive accountability body) has overall responsibility for actions related to climate change. Establishment of low-carbon management organisation.	0, 1	1 point if there is a dedicated management department; otherwise, 0 points.
		(4) ACC2: Describes the mechanism by which the board (or other executive body) reviews company progress regarding climate change.	0, 1	1 point if it includes mechanism or department review of climate change; otherwise, 0 points.
		(5) Training or promotion of low-carbon awareness among employees	0, 1	1 point if there is training or promotion; otherwise, 0 points.
		(6) Incorporation of low-carbon energy efficiency in performance assessment	0, 1	1 point if included in the performance assessment; otherwise, 0 points.
	Climate change risks and opportunity (7/8)	(7) CC1: Assessment or description of the risks (regulatory, physical, or general opportunities) related to climate change and actions taken or impending.	0, 1	1 point if included in description of the risks relating to climate change and actions taken or to be taken; otherwise, 0 points.
		(8) CC2: Assessment or description of current (and future) financial implications, business implications, and opportunities of climate change.	0, 1	1 point if included in the climate change opportunities; otherwise, 0 points.
	Carbon emission accounting (9/10/11)	(9) GHG1: Description of the methodology used to calculate GHG emissions (GHG protocol or ISO)	0, 1	1 point if it describes the GHG calculation methodology; otherwise, 0 points.
		(10) GHG2: External verification of quantity of GHG emission; if so, by whom and on what basis.	0, 1	1 point if it includes verification of GHG quantity; otherwise, 0 points.
		(11) GHG6: Disclosure of GHG emissions by the facility- or segment-level.	0, 1	1 point if it includes carbon emission data or resource usage; otherwise, 0 points.

CAIDM	Carbon emission accounting (12/13)	(12) Carbon emission data or resource usage related to carbon emissions.	0, 1	1 point if disclosed by the facility- or segment-level; otherwise, 0 points.
		(13) GHG7: Comparison of GHG emissions with previous years.	0, 1	1 point if there is trend comparison; otherwise, 0 points.
	Carbon reduction performance (14/15/16)	(14) Recognition or awards for carbon emission reduction by relevant organisations.	0, 1	1 point if recognised by the government; otherwise, 0 points.
		(15) Resource conservation, utilisation, and development.	0, 1	1 point if included in the reduction performance; otherwise, 0 points.
		(16) RC3: Emissions reductions and associated costs or savings achieved to date due to the reduction plan.	0, 1	1 point if included in the cost saving for the reduction; otherwise, 0 points.
	Capital investment and returns (17/18)	(17) Low-carbon research and development investment and achievements.	0, 1	1 point if included in the investment and achievements; otherwise, 0 points.
		(18) Benefits from low-carbon economic development.	0, 1	1 point if included in low-carbon economic development; otherwise, 0 points.

Sources: Bae Choi et al. (2013) and Fan (2021)

Company Profitability: Companies with stronger profitability generate higher annual operating profits and are more capable of undertaking corporate social responsibility (CSR) and high-quality environmental accounting disclosures (Xiong, 2015). The return on equity (ROE) is the most comprehensive indicator for measuring profitability levels. The ROE represents the ratio of the organisational net profit to shareholders' equity over a specific period and reflects the return on investment from the shareholders' perspective. Shareholders can compare companies using the ROE and choose the company offering the highest investment return as their investment target (So, 2023; Utami, 2022). Thus, Hypothesis 2 was suggested: Hypothesis 2: Company profitability is positively correlated with the CAID level.

The operational definitions of the variables used in this study are detailed in Table 3.

Table 3 Operational Definitions of the Variables

Variable	Variable Name	Symbol	Description
Explanatory	CAID index	CAIDI	CAID index
Response	Company size	CS	Log total assets; total assets at the end of the period logarithm
	Profitability (ROE)	ROE	Net operating profit (NOP)/average net assets

The research model was constructed as follows:

$CAIDI$	=	CAID index
$\alpha_0 - \alpha_2$	=	Regression coefficient
CS	=	Log total assets
ROE	=	NOP/average net assets
	=	Disturbance term

FINDINGS

In this study, the total assets of the annual report data for 2021 of the sampled 131 companies were represented using the log total assets. The maximum value of 38.58 was distributed within the Electric Power, Heat Production and Supply sector (D44), while the minimum value of 28.87 was distributed within the Petroleum Processing, Coking, and Nuclear Fuel Processing (C25) sector. The mean value was 32.69 (standard deviation: 2.12). The findings suggested substantial disparities in the asset sizes among the heavily polluting industries.

The magnitude of organisational assets is a significant metric for assessing its financial security and overall size. In this study, the average asset size among the sampled industries was 28–38. This result implied that certain industries own greater asset quantities, whereas other industries have comparatively lower asset quantities. The average asset scale parity of the Electricity, Heat Production, and Supply sector (D44) was 34.87 (maximum: 38.58; minimum: 30.1). Contrastingly, the mean asset size of Petroleum Processing, Coking, and Nuclear Fuel Processing (C25) companies was 29.55 (maximum: 30.23; minimum: 28.87). This phenomenon underscored variations in the magnitude of assets across the industries.

Profitability is a fundamental metric for assessing organisational success. The ROE was evaluated as a representation of profitability,

where the Chemical Raw Materials and Chemical Product Manufacturing (C26) sector had the highest recorded ROE value (0.53). Conversely, the Electric Power, Heat Production, and Supply (D44) sector had the lowest recorded ROE value (1.26). The average ROE across the various industries was 1.26–0.53. Certain industries exhibited higher profitability, whilst others had comparatively lower profitability. For example, the mean ROE of the Chemical Fibre Manufacturing (C28) sector was 0.23, but the average ROE of the Electric Power, Heat Production, and Supply (D44) sector was 0.04. This observation suggested notable variations in profitability across various industries.

The CAID of 131 firms was evaluated based on the grading criteria outlined in Table 3. The score proportions for CAIDM and CAIDNM were 8/18 and 10/18, respectively. The actual summary score for CAID was 580 points, where CAIDNM scored 369 points, which constituted 63.62% of the total score. The CAIDM scored 211 points, which represented 36.38% of the total score.

The average CAID score was 4.42, indicating low carbon reporting in heavily polluting industries. The Non-ferrous Metal Smelting and Rolling Processing (C32) sector had the highest score of 17, followed by Electric Power, Heat Production, and Supply (D44) and Coal Mining and Washing (B06) with 16 each. Several sectors, including Electric Power, Heat Production, and Supply (D44), had minimum scores of 0. The Non-metallic Mineral Mining and Quarrying (B10) and Non-ferrous Metal Ore Mining (B09) sectors had the highest mean score of 9, followed by Petroleum and Natural Gas Extraction (B07) with 8, and Coal Mining and Washing (B06) with 7.4. Table 4 presents the multiple linear regression analysis results.

Table 4: Multiple Linear Regression Results

Model B	Unstandardised Coefficients		Standardised Coefficients	t	Sig. Tolerance	Collinearity Statistics	
	Std. Error	Beta				VIF	
(Constant)	-33.018	5.029		6.565	0.000		
LOG TOTALASSETS	0.977	0.147	0.526	6.634	0.000	0.812	1.232
PROFITABILITY (ROE)	3.980	1.849	0.162	2.153	0.033	0.896	1.116

In Table 4, LOG TOTALASSETS recorded $B = 0.977$ and $p < 0.001$. The regression coefficient for LOG TOTALASSETS was 0.977 and the associated p-value was < 0.001 . The results indicated a highly significant influence on CAID. Thus, the company size was positively correlated with the CAID level and passed the significance test, and the correlation was consistent with the hypothesis. This result indicated that larger companies are more likely to disclose carbon information. The results aligned with Hypothesis 1 and were consistent with the results of Yan (2014), Li et al. (2018), Faisal et al. (2018), and Asif (2021).

In PROFITABILITY (ROE), $B = 3.980$ and $p = 0.033$, which indicated that profitability positively affected CAID, albeit less robustly than total assets. This result indicated that company profitability strength or weakness is significantly related to the CAID level. Strongly profitable companies in the heavily polluting industry actively communicate positive signals to the market by proactively disclosing carbon information. This result was consistent with the notable positive correlations by Faisal et al. (2018) and Hapsoro and Falih (2020).

DISCUSSION AND RECOMMENDATION

In this study, CAID among A-share listed companies in heavily polluting industries was predominantly non-monetised, with CAIDNM and CAIDM constituting 63.62% and 36.38% of the total score, respectively. The absence of clear legislative restrictions and standardised methodologies likely contributed to the prevalent use of non-monetised metrics. The total CAID level of the sampled companies

was not high, and there remains substantial opportunity for growth. The average score among the 131 firms was 4.43, with a wide range (minimum: 0; maximum: 17). This result suggested that the firms had significantly varied disclosure levels. Companies frequently adhere to voluntary disclosure principles due to the absence of clear CAID legislative restrictions, which results in overall low disclosure.

The findings indicated that Hypothesis 1 was supported, where the increase in total assets and CAID level were significantly positively correlated ($B = 0.977$, $p = 0.000$). This result suggested that larger companies tended to engage in more detailed and comprehensive CAID. This tendency might be due to larger enterprises prioritising transparency and social responsibility in response to societal and stakeholder pressures. Such companies actively disclose carbon accounting information to meet societal expectations. Furthermore, larger companies have a robust capability to shape positive perceptions among the public and key stakeholders. The proactive disclosure of greenhouse gas emission information by such companies demonstrates environmental corporate responsibility. This result underscored the positive role of large corporations in highlighting environmental sustainability through information disclosure (Faisal et al., 2018). Furthermore, larger companies are more likely to use annual reports or other corporate documentation to disclose CSR information (Brammer & Pavelin, 2006).

Profitability was represented by ROE and was positively correlated with the CAID level, albeit with a weaker intensity compared to total assets. Specifically, the enhanced profitability demonstrated a positive correlation trend with the increase in CAID levels. This result suggested that companies in the heavily polluting industry with stronger profitability are more likely to convey positive market signals by actively disclosing carbon accounting information, which highlights their commitment to environmental sustainability. Profitable companies tend to exhibit higher carbon information disclosure indices due to their capacity to allocate ample resources for environmental disclosure expenses. Contrastingly, less profitable companies might prioritise financial goals, which limits their capacity to engage in environmental disclosure practices (Prado-Lorenzo et al., 2009).

Based on the findings, four recommendations are proposed to improve the development of organisational carbon accounting disclosure: First, official legislation mandating that businesses disclose carbon accounting information should be established. Establishing a clearly defined legislative framework would enable regulatory authorities to enforce mandatory disclosure of carbon accounting data. Such disclosure would ensure compliance with environmental obligations and effectively reduce carbon emissions. This approach would foster a fair and competitive business environment, which would motivate companies to adopt sustainable models and contribute to low-carbon development.

Second, transparent rules that encourage businesses to integrate financial carbon accounting data into their reports should be implemented. Detailed disclosure requirements can guide enterprises in systematically collecting, analysing, and reporting carbon accounting information. Emphasising monetary carbon accounting data in reports and integrating textual explanations would enhance clarity and comprehensibility.

This transparency would improve disclosure and generate more comprehensive carbon accounting information for sustainable management.

Third, the corporate asset scale should be expanded by increasing the debt ratio. Companies can invest in cutting-edge carbon emission reduction technologies and environmental facilities through debt financing, which would demonstrate financial flexibility and commitment to protecting the environment (Luo et al., 2023). Increasing the debt ratio would fund new energy projects, which would contribute to asset scale expansion and support comprehensive CAID aligned with sustainable development goals.

Lastly, corporate profitability should be enhanced through strategic measures (revenue growth, cost reduction, expense minimisation, tax optimisation). Identifying climate-related opportunities, adhering to environmental regulations, investing in green technologies, and leveraging government incentives can enhance revenue. Optimising costs would involve environmental responsibility initiatives and energy-saving programmes, while efficient tax management, collaboration with policymakers, and proactive utilisation of incentives would contribute to profitability. As profitability frequently correlates with superior carbon disclosure, investors should prioritise companies with higher carbon disclosure indices. This approach would encourage companies to disclose more information and attract additional investment capital for corporate expansion.

CONCLUSION

This research analysed 2021 data from A-share listed companies in Chinese heavily polluting industries to assess their CAID practices. Findings showed suboptimal CAID, marked by insufficient comprehensiveness and poor comparability, with a preference for qualitative over quantitative disclosures. Larger, more profitable companies exhibited higher CAID

levels, highlighting the influence of financial performance and size. The study emphasized the need for ongoing improvements in carbon disclosure and suggested future research should develop more comprehensive, quantitative, and standardized disclosure standards to promote sustainability and transparency.

REFERENCE

- Asif, Muhammad. (2021). Evaluation of factors affecting carbon accounting information disclosure: A case of ASEAN countries. *Arthatama*, 5(2), 27-38.
- Avi, Maria Silvia. (2022). The Relationship Between Financial Reporting and Sustainability Report. The Exposure Draft: IFRS S1 General Requirement for Disclosure of Sustainability-Related Financial Information (From International Sustainability Standard Board) Overcomes the Duality of External Corporate Disclosure. *Journal of Economics, Finance and Management Studies*, 5(04), 1008-1031. CDP (2021).
- Chen, Q. (2018). *Research on the Influence Factors of Carbon Accounting Information Disclosure of Listed Companies in Heavy Polluting Industries*. (Master), Gansu Political Science and Law Institute. Available from Cnki
- Choi, Bo Bae, Lee, Doowon, & Psaros, Jim. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, 25(1), 58-79.
- Faisal, Faisal, Andiningtyas, Erika Dwi, Achmad, Tarmizi, Haryanto, Haryanto, & Meiranto, Wahyu. (2018). The content and determinants of greenhouse gas emission disclosure: Evidence from Indonesian companies. *Corporate Social Responsibility and Environmental Management*, 25(6), 1397-1406.
- Fan, C. (2021). *Study on the effect of different types of carbon information disclosure on corporate performance in polluted industry*. (Master), Harbin Institute of Technology. Available from Cnki
- Foster, George. (1986). *Financial statement analysis*, 2/e: Pearson Education India.
- Freeman, R Edward. (2010). *Strategic management: A stakeholder approach*: Cambridge university press.
- Gamerschlag, Ramin, Möller, Klaus, & Verbeeten, Frank. (2011). Determinants of voluntary CSR disclosure: empirical evidence from Germany. *Review of managerial science*, 5, 233-262.
- Gao, M. L. (2014). *Research on the Determinants of Carbon Accounting Information Disclosure by Manufacturing Listed Companies* (Master), Northeast Agricultural University. Available from Cnki
- Hapsoro, Dody, & Falih, Zaki Naufal. (2020). The effect of firm size, profitability, and liquidity on the firm value moderated by carbon emission disclosure. *Journal of Accounting and Investment*, 21(2), 240-257.
- Ika, SR, Okfitasari, A, & Widagdo, AK. (2022). *Factors influencing carbon emissions disclosures in high profile companies: some Indonesian evidence*. Paper presented at the IOP Conference Series: Earth and Environmental Science.
- Kholmi, Masiyah, Karsono, Attika Dewi Shaqinnah, & Syam, Dhaniel. (2020). Environmental Performance, Company Size, Profitability, And Carbon Emission Disclosure. *Jurnal Reviu Akuntansi dan Keuangan (JRAK)*, 10(2), 349-358.
- Kolk, Ans, Levy, David, & Pinkse, Jonatan. (2008). Corporate responses in an emerging climate regime: The institutionalization and commensuration of carbon disclosure. *European accounting review*, 17(4), 719-745.
- Larasati, Rudiawie, Seralurin, Yohanes Cores, & Sesa, Pascalina Van Sweet. (2020). Effect of profitability on carbon emission disclosure. *The International Journal of Social Sciences World (TIJOSW)*, 2(2), 182-195.
- Li, Dayuan, Huang, Min, Ren, Shenggang, Chen, Xiaohong, & Ning, Lutao. (2018). Environmental legitimacy, green innovation, and corporate carbon disclosure: Evidence from CDP China 100. *Journal of Business Ethics*, 150, 1089-1104.
- Liu, Mi. (2018). *A Study on Environmental Accounting Information Disclosure of the Influencing Factors Illustrated by the Case of Pharmaceutical Manufacturing Listed Companies*. (Master), Central South University of Forestry and Technology. Available from Cnki
- Luo, Xiaobin, Nipo, Debbra Toria, & Jaidi, Junainah. (2023). Technological innovation and the quality of environmental information disclosure: Evidence from a-share companies listed on China's Shanghai and Shenzhen stock exchanges. *Asian Economic and Financial Review*, 13(12), 923-935.

- Ma, W.W. (2015). *A Study on the Influencing Factors of Carbon Accounting Information Disclosure Based on the Empirical Data from The Heavily Polluting Industry of the Shanghai A-shares*. (Master), Inner Mongolia University of Finance and Economics.
- Ou, Xu, & Jiang, Haiwei. (2023). The Impact of Environmental Regulation on Firm Performance: Evidence from the Pulp and Paper Industry in China. *International Journal of Environmental Research and Public Health*, 20(4), 2982.
- Pasko, Oleh, Chen, Fuli, Oriekhova, Alvina, Brychko, Alina, & Shalyhina, Iryna. (2021). Mapping the literature on sustainability reporting: A Bibliometric analysis grounded in Scopus and Web of science core collection. *European Journal of Sustainable Development*, 10(1), 303-303.
- Prado-Lorenzo, José-Manuel, Rodríguez-Domínguez, Luis, Gallego-Álvarez, Isabel, & García-Sánchez, Isabel-María. (2009). Factors influencing the disclosure of greenhouse gas emissions in companies world-wide. *Management Decision*, 47(7), 1133-1157.
- Shen, Huayu, Zheng, Shaofeng, Adams, Jeffery, & Jaggi, Bikki. (2020). The effect stakeholders have on voluntary carbon disclosure within Chinese business organizations. *Carbon Management*, 11(5), 455-472.
- So, Michael. (2023). Empirical Analysis of the Carbon Accounting Information Disclosure (CAID) Affecting R&D Investment and Sustainable Development in State-Owned and Non-State-Owned Enterprises. *Sustainability*, 15(4), 3737.
- Utami, Meilani Devi. (2022). Factors influencing the carbon emissions disclosure in basic and chemical industrial companies listed on the IDX in 2016-2019. *International Journal of Research in Business and Social Science* (2147-4478), 11(9), 193-204.
- Xiong, J.C. (2015). Current Situation and Influencing Factors of Environmental Accounting Information Disclosure of Listed Companies in China: Empirical Evidence from Listed Companies in Heavy Pollution Industries. *South China Finance*(12), 42-48.
- Yan, G.Q. (2014). *A Study on the Influencing Factors of Carbon Accounting Information Disclosure in Chinese Listed Companies in Heavy Polluting Industry*. (Master), Journal of Xi'an Shiyu University (Social Science Edition), . Available from Cnki
- Yang, R.L. (2022). Study on the influencing factors of carbon accounting information disclosure: Based on listed companies in Shenzhen A-share market *Business Accounting* (6), 101-104.
- Yu, Hui-Cheng, Kuo, Lopin, & Ma, Beiling. (2020). The drivers of carbon disclosure: Evidence from China's sustainability plans. *Carbon Management*, 11(4), 399-414.
- Zhao, X.M., & Yan, G.Q. (2014). An Empirical Research on the Impact of Operating Performance on the Carbon Information Disclosure Level — Evidence from Shanghai Stock Exchange A-share of CDP Reports in China. . *Journal of Xi'an Shiyu University (Social Science Edition)*, 23(02), 41-46.
- Zumente, Ilze, & Bistrova, Jūlija. (2021). ESG importance for long-term shareholder value creation: Literature vs. practice. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 127.

UNVEILING WAGE THEFT: EXPLORING THEMES, IMPLICATIONS AND FUTURE DIRECTIONS

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ABSTRACT

Wage theft remains a persistent and multifaceted issue in contemporary labour landscapes. It is characterised by unfair practices, inadequate regulatory frameworks, and socioeconomic inequalities. This research aims to investigate key themes surrounding wage theft and its implications for individuals and society through a thematic analysis of existing literature. The findings reveal several prominent themes. These include the impact of minimum wage policy, pandemic-induced wage theft, legal, policy and institutional factors, social and economic consequences, worker vulnerability and protection, and human rights and social justice. The analysis also highlights several key takeaways. This paper also proposes recommendations to future research in terms of sampling selection, methodology, development of research questions, drafting operational definition, research design, research approach, instruments selection, study population and emerging research topics. By addressing these research gaps, policymakers, practitioners, and advocates can advance efforts to combat wage theft and promote fair and equitable labour practices in diverse work settings.

INTRODUCTION

Wages represent compensation paid to workers for their labour. The right to earn a proper wage is so fundamental to the human experience that the Universal Declaration on

Human Rights (1948) states that “Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection” (article 23 para 3). The contractual nature of the transaction for wages occurs between employers and employees, with employers paying wages in exchange for workers’ performance of duties, as well as their contributions of time and skills (Organisation for Economic Cooperation and Development, 2024; U.S. Bureau of Labour Statistics, 2024; International Labour Organisation, 2006). Self-evidently, wages are crucial for meeting the basic needs of workers, reducing poverty, and encouraging labour force participation. Economically, wages impact consumer purchasing power, overall growth, and wealth distribution (International Monetary Fund, 2015). Thus, the theft of wages by an employer is a fundamental violation of the rights that workers have been globally recognised to have since the end of World War II.

The theft of wages has undoubtedly been practised since the rise of a paid labour force during the Industrial Revolution in the 1800’s (Cole et al., 2024). However, the term ‘wage theft’ was rather amorphous until recently. According to Levin (2021), the first use of ‘wage theft’ in academic literature was in 1988 when Michael Belknap defined this term as a process by which employers wrongfully withheld their employees’ pay. However, it was not until the 2000’s that the term ‘wage theft’ became part of academic lexicon.

Presently, there is no internationally accepted definition of wage theft. The United Nations itself does not provide a single, unified definition of wage theft that applies to all the bodies that it administers. Many international organisations, including the United Nations and the International Labor Organisation (ILO), define wage theft in relation to the exploitation of migrant workers but do not specifically define wage theft *per se*. For example, the

ILO defines forced labour in the ILO Forced Labour Convention, 1930 (No. 29) as “all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself [or herself] voluntarily” (ILO FLC Article 2(1)). Certainly, forced labour is the quintessential definition of extreme wage theft, however, in circumstances where theft of wages occurs without compulsion to work, a robust internationally agreed definition for research purposes is lacking. At the transnational level, a good working definition of wage theft has been provided by ASEAN-Australia Counter Trafficking (2023) which defines wage theft as “the total or partial non-payment of a worker’s remuneration, earned through the provision of labour services ... It also includes the payment of salaries below the minimum wage, non-payment of overtime, non-payment of contractually owed benefits, the non-negotiated reduction of salaries as well as the retention of dues upon one’s contract termination”.

PROBLEM STATEMENT

Given the scope of wage theft at the international level, the purpose of this study is to conduct a systematic investigation into content analysis on the topic wage theft and to address two main research questions, Further, this study will enrich scholarly discourse and inform future directions in academic enquiry into wage theft.

RESEARCH OBJECTIVES

The research objectives of the study are as follows:

- a. To identify the major themes that have been explored within the wage theft domain.
- b. To evaluate the potential future research avenues, need to be explored in uncovering the global phenomenon of wage theft?

LITERATURE REVIEW

In the academic literature, most authors acknowledge that wage theft involves the practice of the under-payment of wages to employees, either intentionally or inadvertently. It involves not only the failure to pay the correct amount of salary, but also the failure to pay benefits to which the employee is entitled, such as retirement fund contributions (Harkins, 2020; Raghunandan, 2021). In many cases, this under-payment may have been a conscious decision by the employer to withhold properly earned wages and entitlements. However, in a number of cases, wage theft arises from the inadvertent misclassification of an employee as an independent contractor or a casual worker. Whether intentional or inadvertent, the impact on employees of the loss of entitlements through underpayments may be devastating.

While the definition of wage theft may lack clarity, what is not doubted is the international scope of the issue. Wage theft is a global problem, and it is estimated that only the tip of the iceberg has been revealed in studies to date. However, there have been no international statistics gathered on the cost of wage theft to workers globally. Even at the national level, comprehensive statistics on crimes tend to be collected mainly for blue collar crimes, for example the FBI Uniform Crime Reporting program (USA) recorded 234,500 robberies in 2023 (FBI, 2023). Those robberies cost businesses and the public US \$482 million in total losses. However, these staggering numbers pale in comparison to the estimated US \$50 billion every year that employers fail to pay to their workers (Saurav Sarkar, 2022). And, this is in the US alone. In Australia, it is estimated that workers lose AUD \$850 million per year to under-payment of entitlements (Australian Bureau of Statistics, 2022). Turning to South East Asia, ASEAN-Australia Counter Trafficking (2023) found significant wage theft during the COVID-19 pandemic in all South East Asian countries, and whether or not that

has now been alleviated in the post-pandemic employment landscape remains to be seen.

METHODOLOGY

This study utilises thematic analysis as the primary methodological approach to collect and analyse literature on wage theft from indexed journal articles. Thematic analysis involves systematically exploring repositories or databases that contain scholarly articles, research papers, and other relevant publications on wage theft. In this study, we focus on well-known repositories to ensure comprehensive coverage of wage theft literature. Data extraction is conducted to retrieve key information, such as author names, publication dates, journal titles, abstracts, and keywords. This information is then synthesised and organised to enable further analysis and interpretation.

To facilitate the identification of key themes, we utilised Voyant Tools, a web-based text analytical software programme to analyse the research objectives of 51 articles. Voyant Tools allows for the visualisation and exploration of text data, making it an invaluable resource for predicting themes. Using Voyant, we conducted word frequency analysis, generated word clouds, and examined trends and correlations within the text corpus. This software helped in identifying prominent keywords and phrases, which were then categorised into relevant themes. Then, thematic analysis and interpretation were employed to synthesise data and identify key themes, trends, and insights in the field of wage theft. In addition to categorising extracted data into relevant themes, this paper also analyses patterns and relationships among themes. Throughout the process of thematic analysis, we have given the highest priority to ethical considerations such as copyright compliance and proper citation of sources. All retrieved articles have been attributed correctly, and the study adheres to the ethical guidelines outlined by relevant scholarly associations and institutions.

FINDINGS

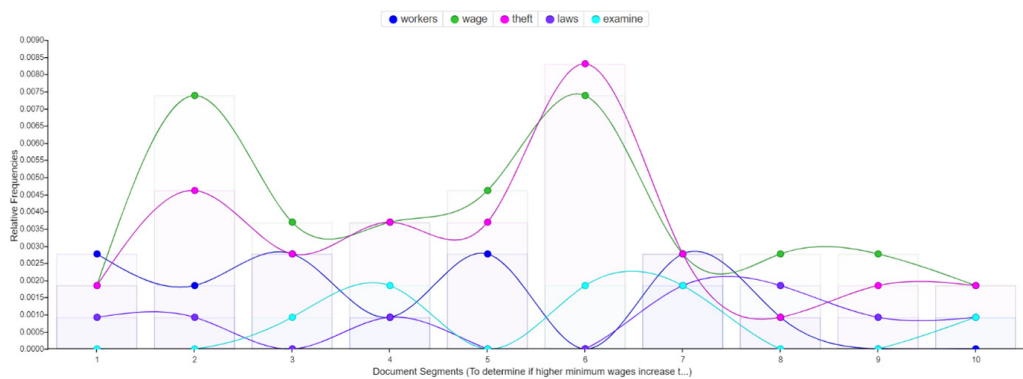


Figure 1: Relative Frequency and Document Segments Trends



Figure 2: Corpus Collocate Graph

The line graph depicts the distribution of a word's occurrence across a corpus or document. Meanwhile, collocates Graph represents keywords and terms that occur in proximity as a force directed network graph. This type of graph helps in understanding the contextual usage of words and their associative patterns. The graph clearly displays the 'node' (Target word), which is a central word around which the graph is constructed. Words such as 'wage', and 'theft' have been identified as the central words and associated collocates are around the node. The connecting edges between the words illustrate the connection among those words. The thickness of the links between words represents the strength of relationships studied in the selected articles. Stronger associations might be shown with brighter or differently coloured edges.

Major Themes

a. Impact of Minimum Wage Policies.

Up to date, much of the academic research in the wage theft space has been conducted in the United States. Clemens and Strain (2020) and Cooper and Kroeger (2017) investigated the prevalence of wage theft and the impact of minimum wage policies using different methodologies. Firstly, Clemens and Strain employed a quantitative approach, conducting statistical analysis of data from the Current Population Survey (CPS). They extracted wage-related variables from the Merged Outgoing Rotation Groups (MORG) of the CPS, which involved interviews with individuals conducted over multiple years. This method provides a nationally representative sample, enhancing the external validity of their findings. However, the internal validity relies on the accuracy of the wage-related variables collected through interviews, which may introduce biases due to respondent reporting accuracy.

By contrast, Cooper and Kroeger (2017) used a mixed-method approach. They conducted their own survey of frontline workers in three major metropolitan areas, also relying on data from the CPS Rotation Group to identify workers whose reported earnings were below the State minimum wage. While this approach allowed for a more focused investigation of wage theft experiences, there

is a possibility that sampling biases were introduced if survey respondents did not accurately represent the broader population. Additionally, the validity of their findings relies on the accuracy of the survey questions. Factors such as respondent comprehension or willingness to disclose sensitive information may have influenced the effectiveness of these questions.

Each study provides valuable insights into the prevalence and implications of wage theft. However, their methodological differences emphasise the trade-offs between using existing survey data for broad generalisations and conducting targeted surveys for in-depth exploration. Clemens and Strain (2020) focused on several key variables including minimum wage increases, the prevalence of subminimum wage payment, and the strength of enforcement regimes. Their study aimed to estimate the extent of subminimum wage payment, and to determine whether changes in the prevalence of subminimum wage payment were influenced by enforcement provisions in the relevant State labour laws. By contrast, Cooper and Kroeger (2017) focused on assessing the prevalence and magnitude of minimum wage violations in the ten most populous U.S. States. Their study examined the key variable of minimum wage violations, which are defined as workers being paid below the legally mandated hourly minimum wage. The authors found that low-wage workers were particularly vulnerable to wage theft and at risk of falling below the poverty line. Both the Clemens and Strain (2020) and Cooper and Kroeger (2017) studies align with legal definitions of wage theft by addressing non-compliance with minimum wage laws, although Clemens and Strain's approach is broader as it encompasses subminimum wage payment and underpayment. However, neither study investigated state-level minimum wage policies. It is evident from the analysis that investigating variables and measures on the impact of minimum wage policies provide more insights.

b. Pandemic-Induced Wage Theft.

During the COVID-19 pandemic and the resulting recession, millions of low-wage workers have faced heightened vulnerability to exploitation. Despite this, there has been limited academic focus on the connection between increasing unemployment, violations of labour standards, and the capacity of governments to enforce these standards during economic downturns. Migrant workers, who make up a precarious segment of the workforce in a number of countries, are employed in sectors that have long been prone to labour rights violations. The pandemic has intensified the exploitation of these workers, as seen in the widespread issues of non-payment or underpayment of wages for their labour (Foley and Piper, 2021).

In a study carried out by ASEAN-Australia Counter Trafficking (2023), the linkages between wage theft and forced labour during the COVID-19 pandemic within five ASEAN nations – Thailand, Malaysia, Cambodia, the Philippines and Indonesia – was explored. Data was collected through interviews and focus group sessions. It was found that there was a strong correlation between the experiences of immigrant workers during the pandemic and under-payment of wages. For those immigrant workers who experienced serious wage theft issues, their working and living conditions were worsened during the pandemic in both the host country and on return to their country of origin. Immigrant workers were found to be highly susceptible to wage theft, and in conjunction with weak support and poor information about support structures, their plight was largely unheard by government agencies in their host countries as the policies implemented by host countries were not designed to protect this cohort of workers.

In an article commissioned by Asia Floor Wage Alliance (AFWA) & Global Labor Justice (2023), light has been shed on wage theft in

'Big Fashion' in South and Southeast Asia. The AFWA explains how fashion corporations exploited the pandemic to under-pay workers in their supply chains in Asia and enrich themselves. One case in point is Nike Inc., who paid US 74 million in dividends to the Knight family (the company's largest shareholder) in 2020. Meanwhile, with the rationale of pandemic cutbacks, factory workers in Indonesia who stitch the famous Nike logo onto its branded gear, had their salaries cut in half, despite the fact that these workers were barely earning above-poverty line wages. Other companies with supply chains stretching into the Global South, such as Levi Strauss & Co, and the VF Corporation (which owns Northface, Timberland etc) report similar profits to shareholders while simultaneously making drastic salary cuts to workers.

The studies focusing on pandemic-induced wage theft reveal that in various parts of the world, the most vulnerable workers were exploited with companies justifying lay-offs and underpayments as financially necessary responses to uncertain times (Foley and Piper, 2021). ASEAN-Australia Counter Trafficking (2023) made similar findings and added a gloss on our understanding of underpayments to immigrant workers by reporting that even when migrant workers returned to their country of origin following the lifting of pandemic restrictions, they remained impoverished. Additionally, studies make it abundantly clear that large multinational companies profited from the pandemic at the expense of workers' rights to earn "just and favourable remuneration" as per the Universal Declaration on Human Rights (1948) (Asia Floor Wage Alliance (AFWA) & Global Labor Justice (2023). While the studies highlight the exploitation of vulnerable workers and the role of large corporations in perpetuating wage theft, there is limited analysis on how specific government policies, both in host and origin countries, have attempted to mitigate or exacerbate wage theft during the COVID-19 pandemic and its aftermath.

c. Legal, Policy, and Institutional Factors.

Legal, policy and institutional factors each present unique challenges in addressing wage theft and related issues. In India, Saha et al. (2023) highlights the complexities within the tea plantation industry, where wage appropriation occurs through strict compliance and non-compliance with different laws. In Australia, Barnes et al (2023) emphasise the prevalence of modern slavery and slavery-like practices, with a focus on the inadequacies of law enforcement responses. They argue for a vulnerability framework that recognises the role of laws, policies, and institutions in perpetuating exploitation, particularly among migrants and irregular migrants.

Employment law scholars in Australia have focused on the issue of temporary migrant workers who take on paid work during their stay. It was estimated that in 2018, there were 1.2 million such persons temporarily residing in Australia Campbell (2018). Such workers who are temporarily in the jurisdiction are extremely vulnerable to underpayment due to predatory business models. Not only does this negatively impact this cohort of workers, it also plays a role in overall wage stagnation. Australia's strict visa system is identified as a contributing factor that worsens vulnerabilities and impedes victims from accessing solutions.

With respect to legal factors impacting wage theft, two Australian jurisdictions (Victoria and Queensland) recently implemented wage theft legislation criminalising under-payment of wages and other entitlements such as superannuation (pension fund) contributions. These laws were designed to complement the powers of the Commonwealth Government to enforce civil provisions of the *Fair Work Act 2009* (Cth) (FWA). Commonwealth legislation and pursuit of errant employers by the Fair Work Ombudsman (FWO), invested with powers under the FWA, has not been enough to ensure that victims are compensated for their losses. In 2022, the FWO recovered \$532

million in stolen wages, however, not all that made its way back into the hands of the victims (Special Broadcasting Service 2023). Much of those recovered wages are instead forfeited to the Commonwealth Government.

Turning to the state of Victoria, the *Wage Theft Act 2020* (Vic) came into force in the state on 1 July 2021. Part 3 of the Act set up a dedicated Wage Theft Inspectorate which has been provided with funding to both inspect workplaces and bring criminal prosecutions of wage theft. Part 2 of the Act creates the criminal offences of the dishonest withholding of employee entitlements; and other offences. These offences may be committed by officers of a company, partners, unincorporated associations. Despite over ten successful prosecutions under this Act (including against large corporations such as NAB, CommSec, and BankWest), a High Court challenge was mounted against the validity of the legislation on constitutional grounds (Marin-Guzman, 2023). Recently, the Victorian Government announced that it will repeal its wage theft legislation, the state government having posted a message on its website that the Wage Inspectorate will assist workers to find alternative avenues to claim underpayments.

In a comparative study of both the Victorian and Queensland laws that criminalise wage theft Nikoloudakis & Ranieri (2023) conclude that the Victorian was more advanced in terms of being able to deter deliberate wage theft, however, they argue that Commonwealth legislation is needed. This comparative analysis is now moot given the stated intention of the Victorian government to repeal the law that was found to offend the Commonwealth Constitution. Commonwealth of Australia introduced a significant change to its legislation regarding wage theft through the *Fair Work Legislation Amendment (Closing Loopholes) Act 2023*. This law has been enacted to criminalise the intentional underpayment of employees, addressing the issue at the federal level, thus validating the work of Nikoloudakis & Ranieri (2023). However, the new Commonwealth offence

of wage theft, will only come into effect on 1 January in 2025. The FWO will be invested with powers to criminally prosecute cases of wage theft with severe penalties that include fines of up to nearly \$3 million for corporations and up to 10 years imprisonment for individuals (such as directors of companies). Inadvertent underpayments are specifically made immune from criminal prosecution (*Fair Work Legislation Amendment (Closing Loopholes) Act 2023* (Cth)).

Moving to the United States, Fritz-Mauer (2021) described efforts in the District of Columbia to address wage theft through enforcement schemes, noting the shift towards viewing wage theft as a personal harm to be remedied through civil justice systems. However, the author argues that such approaches overlook the systemic nature of wage theft and the need for proactive government intervention to ensure compliance and protect workers' rights. Meanwhile, Kim and Allmang (2020) in their study on the US response to wage theft, highlight legislative efforts to amend federal employment and labour policies. They illustrate the importance of comprehensive analyses to guide future policy interventions effectively. The critical juncture in US efforts to combat wage theft stress the need for evidence-based policies informed by rigorous research and analysis.

The above-mentioned studies have provided valuable insights into the policy implications of legal, policy, and institutional frameworks in specific geographical contexts. For example, Barnes, Mahmud Naser, and Aston (2023) highlight the limitations of existing law enforcement approaches in combating modern slavery in Australia. They propose a vulnerability framework that prioritises policy, legal, and institutional reforms to address structural vulnerabilities that contribute to exploitation, especially among irregular migrants. Their recommendations include establishing a national compensation scheme for victims and reforming Australia's visa system to reduce vulnerability. Similarly, Fritz-Mauer (2021) emphasises the importance of institutional reforms and public solutions in

detering wage theft and ensuring justice for low-wageworkers. They propose organisational shifts within wage and hour agencies to adopt a more empathetic understanding of workers' experiences and advocate for policy measures that do not disrupt the status. Furthermore, Kim and Allmang (2020) highlight the need for additional evidence regarding the effectiveness of advocacy efforts targeting wage theft in the United States. Their findings emphasised the ongoing challenges in addressing wage theft and the significance of evidence-based policymaking to enhance labour market experiences for vulnerable workers. The criminalisation of wage theft in Australia had a rocky start with a constitutional challenge to the law introduced by the state of Victoria, however Commonwealth legislation will take effect in 2025 (*Fair Work Legislation Amendment (Closing Loopholes) Act 2023* (Cth)). It is evident from the analysis, that all these studies stress the necessity for targeted policy interventions, institutional reforms, and evidence-based approaches to address wage theft and related labour rights violations in specific geographical contexts.

d. Social and Economic Consequences.

Social and economic consequences is a recurrent theme studied in the wage theft domain. The policy recommendations and implications proposed by each study provide valuable insights into how to address wage theft and its social and economic consequences. Fussell's (2016) analysis emphasises the importance of legal status in determining vulnerability to wage theft among migrant workers. By highlighting situations in which threats to legal status may not be effective, such as when unauthorised migrants are not at risk of arrest or deportation, Fussell suggests taking up opportunities for further research to better understand the complexities of this issue. This indicates the need for policies that improve protections for all workers, regardless of their immigration status, and strengthen enforcement mechanisms to prevent labour

exploitation. Meanwhile, Ferris and Ross (2022) propose disrupting the societal and disciplinary acceptance of wage theft through additional criminological studies. Their suggestion to document the direct and indirect harms of wage theft highlights the importance of acknowledging this form of exploitation as a serious crime with widespread implications. By bringing attention to the societal acceptance of wage theft, this approach emphasises the need for legal reforms, public awareness campaigns, and advocacy efforts to challenge established norms and hold perpetrators accountable.

Additional evidence of social and economic consequences can be gleaned from a study carried out by Ahmed (2024) in which she argues that the practice of wage theft is a major form of violence in feminised workplaces, such as the garment factories of Bangladesh. Ahmed exposes the "docile workforce" of these factory settings and emphasises how powerful actors exploit these dynamics to maintain their privileges. This author calls for structural reforms to empower workers and dismantle systems of oppression. Her work emphasises the importance of adopting a feminist and intersectional approach to labour rights advocacy, recognising the intersections of gender, class, and labour exploitation in shaping workers' experiences. It is evident from the analysis that it is important to recognise the structural factors that perpetuate exploitation and inequality, and advocate for systemic reforms to protect the rights and dignity of all workers.

The common parameter among the studies that fall under this theme is how contextual factors shape workers' experiences of wage theft. The contextual factors surrounding each study on wage theft play a crucial role in shaping the experiences of exploitation and the implications of the research findings. In Fussell's (2016) study, conducted in New Orleans, Louisiana, in the aftermath of Hurricane Katrina, the

geographical and temporal context post-disaster construction significantly influenced the prevalence of wage theft among Latino migrant workers. The socio-economic vulnerability exacerbated by the disaster, combined with the visual identifiability of Latino migrants, made them prime targets for wage theft and criminal victimisation.

Ferris and Ross's (2022) contribution to the narrative surrounding social and economic consequences is their focus on how the temporal context of neoliberal restructuring over the past three decades has influenced participants' perception of wage theft. The socio-economic context, they argue, is indicative of broader changes in economic and workplace dynamics, where neoliberal policies prioritise profit maximisation and deregulation, often disregarding workers' rights. To challenge and disrupt this acceptance, it is crucial to conduct further criminological studies that accurately depict the direct and indirect consequences of wage theft. These studies should emphasise its systemic nature and challenge prevailing narratives that obscure structural inequalities. Having grown up in Bangladesh, the Ahmed study (2024) gives a harrowing account of how she personally witnessed the violence perpetrated against low-paid women, migrants and child labourers in the garment factory industry. It is evident from the analysis of these researchers that the geographical, temporal, and socio-economic contexts surrounding each study on wage theft significantly influence the findings and implications of the research.

Worker Vulnerability and Protection:

The studies by Clemens and Strain (2023), Raghunandan (2021), and Segarra and Prasad (2024) offer distinct perspectives on the phenomenon of wage theft, focusing on different demographic groups and industries. Clemens and Strain's study examines the impact of minimum wage increases on various demographic groups, revealing disparities

in underpayment across racial and ethnic lines and age demographics. Their analysis highlights the disproportionate burden faced by young African American workers, who experience higher levels of underpayment compared to the overall population. In contrast, Raghunandan's research investigates the prevalence of wage theft within firms, emphasising its significance as the largest form of theft in the United States and its disproportionate impact on vulnerable employees. By utilising data from Violation Tracker and examining the link between managers' personal incentives and wage theft, Raghunandan sheds light on the complex dynamics contributing to this phenomenon, particularly within organisational contexts. Meanwhile, Segarra and Prasad's study focuses on undocumented Latin immigrant workers, offering insights into the systemic disenfranchisement experienced by this population. Through an exploration of the labour undertaken by undocumented immigrants and the socio-legal identities attributed to them, the researchers illuminate the intersecting factors that contribute to their vulnerability to wage theft. It is evident from the analysis that by comparing and contrasting these populations and samples, we gain a comprehensive understanding of the multifaceted nature of wage theft and the diverse contexts in which it occurs, providing valuable insights for addressing this pervasive issue through targeted interventions and policy measures.

Analysing the theoretical frameworks used in the studies in this domain reveals distinct approaches to understanding wage theft, each shaped by different conceptual foundations and methodologies. Galvin (2016) reviews and builds upon existing scholarship regarding the effectiveness of stronger penalties in reducing wage theft. The study acknowledges the theoretical expectation that higher penalties and enforcement capacities should deter wage violations by increasing the expected costs for employers. However,

Galvin highlights a persistent gap between theory and practice, where stronger penalties do not significantly reduce wage theft due to the high social costs of direct enforcement through policing and prosecutorial activities. This theoretical framework shapes the research question by focusing on the paradox between theoretical deterrents and practical outcomes. Galvin's interpretation of results emphasises the need to rethink enforcement strategies and consider alternative approaches that might bridge the gap between theoretical expectations and practical realities. In contrast, Segarra and Prasad (2024) adopt a grounded theory methodology to explore the experiences of undocumented Latin immigrant workers in the United States. Their theoretical framework is rooted in the concepts of hyper visible identity and modern slavery. By using grounded theory, they inductively develop a theory from the data collected during extensive fieldwork. This approach allows them to build a better understanding of how the socio-legal identities attributed to undocumented immigrants contribute to their systematic disenfranchisement and vulnerability to wage theft. It is evident that the grounded theory methodology shapes their research question by focusing on the lived experiences of undocumented immigrants and how these experiences illuminate broader theoretical concepts.

Human Rights and Social Justice:

Addressing wage theft from both human rights and social justice perspectives requires understanding the distinct approaches of LeBaron (2021) and Galemba (2021). LeBaron's study emphasises that wage theft is intricately linked to forced labour within global supply chains. It underscores the exploitation that arises from inadequate wages and poor labour practices, often perpetuated by multinational corporations (MNCs). The researcher raises critical questions about the conditions under

which forced labour is most likely to occur. Further, the study explores how wages factor into these exploitative practices and how the dynamics within supply chains, particularly those controlled by MNCs, shape labour conditions at the bottom. LeBaron's research aims to advance the literature on forced labour by analysing business models that incentivise or tolerate these practices. In doing so, it informs strategies to combat forced labour on an international scale. Her human rights framework advocates for comprehensive international policies and enforcement mechanisms to protect workers from systemic exploitation.

In contrast, Galemba's study focuses on social justice issues within the US, specifically systemic inequalities and legal disenfranchisement faced by day labourers. The researcher highlights the difficulties these workers encounter in asserting their legal rights due to criminalisation and societal devaluation. Galemba argues that wage theft often falls outside the definition of severe exploitation that warrants a criminal justice response. She emphasises that solely focusing on individual criminals and victims obscures broader structural forms of exploitation. Galemba discusses how day labourers sometimes resort to actions like threatening to steal tools when they are not paid, acts of desperation that further justify their criminalisation. She points to recent legislative efforts in cities like Denver and Boulder, where laws have been revised to enhance wage protections and improve access to justice for low-wage workers. Her research advocates for both legal and non-legal strategies, including community-based advocacy and local ordinances, to address gaps in federal labour standards and protect vulnerable workers. Both studies emphasise the need for systemic reforms to address the root causes of wage theft, whether in global supply chains or local labour markets.

SECTION 4: CONCLUSION AND RECOMMENDATIONS

This investigation of wage theft has revealed its widespread and intricate nature, emphasising the necessity for comprehensive strategies. Both intentional and inadvertent wage theft significantly impact workers' livelihoods and economic equality. Key areas of focus include the effects of minimum wage policies, pandemic-induced wage theft, legal and institutional responses, social and economic consequences, worker vulnerability, and human rights (Research Question 1). The analysis highlights the need for stronger enforcement mechanisms, robust legal frameworks, proactive government intervention, and systemic reforms to safeguard vulnerable workers and combat exploitation. Future research needs to prioritise comparative analyses, policy effectiveness, and socio-economic contexts to develop more impactful strategies against wage theft globally. As the gap between rich and poor widens annually, the need to address wage theft and proffer solutions is urgent. The next paragraphs will recommend suggestions for future researchers in the wage theft space (Research Question 2).

Analysis conducted on the impact of minimum wage policies provide valuable insights into the prevalence and implications of wage theft. Future researchers have various options for obtaining data, including national surveys like the Current Population Survey (CPS) in the United States, administrative records, or custom-designed surveys. It is important for researchers to carefully evaluate the strengths and limitations of each data source, considering aspects such as sample representativeness, data quality, and relevance to their research focus. Depending on their research objectives and available resources, researchers can choose appropriate sampling techniques, such as convenience sampling, random sampling, or stratified sampling. The use of stratified sampling, which involves

dividing the population into distinct subgroups or strata based on certain characteristics would be a highly effective technique to collect data. For example, in the context of studying minimum wage policies, researchers may stratify the population based on factors such as geographic location (e.g., states or regions with different minimum wage levels), industry sectors, or demographic characteristics of workers (e.g., age, gender, ethnicity). Validity and reliability should be prioritised when selecting measures to capture instances of wage theft and the impact of minimum wage policies. Future researchers may conduct pilot studies, pre-tests, or validation checks to ensure the accuracy and consistency of their measures. Given the sensitivity of the topic of wage theft, it is crucial for future researchers to obtain informed consent from participants, maintain confidentiality and data protection, and adhere to ethical guidelines and regulations throughout the research process.

It is clear that certain variables, such as increases in minimum wage, prevalence of wage theft, and enforcement regimes, play a crucial role in determining minimum wages. By being cognisant of these fundamental aspects impacting wage theft, researchers will be able to develop specific research questions and hypotheses that effectively tackle the key aspects of the impact of minimum wage policies. For example, researchers may develop specific research questions such as whether there are differential effects of minimum wage increases on the prevalence of wage theft among various demographic groups, such as minority workers, women, or immigrants? Another research question is how increases in minimum wage levels impact the prevalence of wage theft among low-wage workers in different industries and regions. Building on the operational definitions of wage theft used in previous studies, future researchers should refine their definitions and measures to ensure alignment with legal definitions and the experiences of workers. This process may include conducting qualitative interviews or

focus groups with workers in order to gain insights into their perceptions of wage theft.

Analysis conducted on the legal, policy, and institutional factors reveals that studies to date have largely focused on conducting specific research design studies to investigate wage theft policies and enforcement mechanisms, specifically targeting sectors or industries where wage theft is prevalent. However, future researchers could conduct a comparative analysis of wage theft policies. This comparative study could involve a detailed policy analysis, where researchers examine legislative frameworks, minimum wage laws, and labour regulations pertaining to specific vulnerable sectors in each country. By taking this approach, researchers could then identify differences in legal protections, enforcement mechanisms, and compliance requirements aimed at preventing wage theft and ensuring fair wages for workers. Additionally, they could investigate the enforcement practices and capabilities of government agencies responsible for monitoring and enforcing labour standards in the affected industry. Such investigations should specifically focus on inspection procedures, complaint mechanisms, and penalties for non-compliance with wage laws. By conducting comparative studies among countries and focusing on a particular industry, future researchers will also be able to identify common trends, practices, and innovative approaches in addressing wage theft in specific industries. In addition, following the lead of Australian jurisdictions that have introduced criminal laws with robust enforcement mechanisms and serious sanctions, further research is needed to determine if criminalisation of wage theft could be a viable option in other countries.

One can glean from the analysis that these studies stress the necessity for targeted policy interventions, institutional reforms, and evidence-based approaches to address wage theft and related labour rights violations in specific geographical contexts. Future researchers should examine how

policies are formulated, implemented, and their effectiveness assessed. This will enable researchers to gain insights into the gaps, challenges, and opportunities for improving regulatory frameworks and addressing labour rights violations. For instance, researchers may focus on Asian countries, such as India, Bangladesh, Pakistan, Indonesia, Cambodia, Vietnam, Thailand, Malaysia, or China, where wage theft is a significant issue that has not yet been thoroughly explored. By conducting in-depth interviews with policymakers, labour representatives, and other relevant stakeholders, researchers can gather insights into the process of drafting minimum wage legislation, including the factors that influence policy decisions, stakeholder consultations, and political considerations. Researchers can also use surveys or case studies to assess employers' adherence to minimum wage laws, identify common violations or loopholes, and explore barriers to effective enforcement, such as limited resources or workers' lack of awareness. Through this comprehensive analysis, researchers may uncover issues such as inadequate enforcement mechanisms, disparities in wage compliance across sectors or regions, or the need for complementary policies to support low-wage workers, such as social protection measures or skills development programs. Based on their findings, researchers are able to provide recommendations that may include measures to enhance enforcement capacity, raise awareness about labour rights, involve stakeholders in policy design, and monitor the impact of minimum wage adjustments over time.

Additionally, this investigation highlights the importance of recognising structural factors that perpetuate exploitation and inequality. It advocates for systemic reforms to protect the rights and dignity of all workers. This means the legal status played a significant role in shaping vulnerability to exploitation. This structural vulnerability perpetuated a cycle of exploitation and inequality. Employers could

exploit workers' fears of legal repercussions to withhold wages and violate labour rights with impunity. Without addressing the underlying structural factors that enable and normalise wage theft, efforts to combat exploitation are likely to be ineffective and insufficient in protecting vulnerable workers. Therefore, future researchers can identify key issues related to wage theft, such as the impact of legal status on vulnerability, societal acceptance of this issue, and the role of socioeconomic vulnerabilities in perpetuating exploitation. For example, they may explore how legal status affects vulnerability to wage theft among migrant workers. By examining case studies or conducting surveys among different migrant communities, researchers can investigate the influence of factors like immigration status, documentation status, and fear of deportation on workers' experiences of exploitation and their access to legal remedies.

While the studies highlight the exploitation of vulnerable workers and the role of large corporations in perpetuating wage theft, there is limited analysis on how specific government policies, both in host and origin countries, have attempted to mitigate or exacerbate wage theft during the COVID-19 pandemic and its aftermath. Future researchers may analyse the specific policies enacted to protect low-wage and migrant workers during economic downturns. For example, they may focus on Malaysia's *Prihatin* Economic Stimulus Package and examine how it aimed to protect low-wage and migrant workers during the COVID-19 pandemic. Analysing the *Prihatin* Economic Stimulus Package and similar policies in other jurisdictions may provide valuable insights into the effectiveness of governmental interventions in protecting vulnerable workers during economic downturns. Such research will help develop recommendations for more robust support systems in the future.

Moreover, it is observable that the geographical, temporal, and socio-economic

contexts surrounding each study on wage theft significantly influence the findings and implications of the research. Building upon the understanding that contextual factors significantly shape experiences of wage theft, a promising direction for future research could be explored the role of intersectionality in understanding and addressing wage theft among vulnerable populations. This research could investigate how intersecting identities, such as race, gender, immigration status, and socio-economic status, interact with contextual factors to influence workers' vulnerability to wage theft. For instance, a study could examine how women working in low-wage service industries in urban centres experience wage theft differently based on their immigration status, gender, and socio-economic background. This could involve conducting intersectional analyses to examine how different forms of marginalisation intersect and compound to intensify the risk of exploitation. By focusing on intersectionality in future research on wage theft, researchers would be able to gain a deeper understanding of how multiple variables shape vulnerability to exploitation and this knowledge would inform targeted interventions that address the intersecting forms of discrimination and inequality faced by marginalised workers.

Moving to analysis conducted on worker vulnerability and protection, current papers show that the grounded theory methodology shapes research questions by focusing on the lived experiences of undocumented immigrants and how these experiences illuminate broader theoretical concepts. Galvin's (2016) work, which critiques the effectiveness of stronger penalties, lays a foundation for future researchers to enhance. Other factors that may influence the effectiveness of wage theft deterrents, like employer compliance behaviours or worker awareness and reporting mechanisms, can be explored further by researchers building on this critique. For example, future researchers may undertake studies to investigate how

employer compliance behaviours and worker awareness and reporting mechanisms impact the effectiveness of wage theft deterrents. By examining employer behaviours, future studies could identify specific practices or attitudes that contribute to non-compliance, even when penalties are strong. Such studies may reveal, for example, that employers are more likely to comply when they perceive a higher probability of inspections or when they have internal compliance programmes in place. Moreover, this type of study could offer valuable insights into the level of understanding that workers have regarding their rights and the existing channels available for reporting instances of wage theft. Additionally, future studies have the potential to uncover various factors that discourage workers from reporting such cases, such as fear of reprisal or limited awareness of their legal protections or the cost of bring a case to a court or tribunal. Based on the findings, the research could potentially suggest targeted interventions to improve both employer compliance and worker reporting. For instance, policies could be recommended to increase the frequency of government funded random inspections, provide better education for both employers and workers about wage laws, and enhance protections for whistleblowers.

With respect to the theme of human rights and social justice, current research emphasises the need for systemic reforms to address the root causes of wage theft. Such a comprehensive understanding may lead to more effective and holistic solutions in the fight against wage theft and the protection of vulnerable workers worldwide. For future research, it would be beneficial to investigate the impact of recent legislative reforms in different cities and states on reducing wage theft and improving access to justice for low-wage workers. For instance, researchers could focus on specific research settings and evaluate the effectiveness of a particular wage protection Act. To do so, researchers may collect data on the number of wage

theft complaints filed before and after the Act's implementation. This research could analyse the long-term effects of these legal changes and identify best practices that could be replicated in other regions. Additionally, researchers could assess the level of awareness among low-wage workers regarding their rights under legislation and their access to both legal and non-legal support services. Such research could then determine whether there was a significant decrease in wage theft incidents since legislative implementation.

REFERENCES

- Ahmed, S. (2024). Wage Theft, Secrecy, and Derealization of 'Ideal Workers' in the Bangladesh Garment Industry. *Organization Studies*, 0(0). <https://doi.org/10.1177/01708406241236608>.
- ASEAN-Australia Counter Trafficking. (2023). *Wage theft and forced labour among migrant workers*. Retrieved from <https://www.aseanact.org/resources/wage-theft/>.
- Asia Floor Wage Alliance, & Global Labor Justice - International Rights Forum. (2023, February 27). *Big Fashion and Wall Street Cash in on Wage Theft*. Asia Floor Wage Alliance. <https://asia.floorwage.org/big-fashion-and-wall-street-cash-in-on-wage-theft/>.
- Australian Bureau of Statistics. (2024, April 16). Household income and wealth, Australia. <https://www.abs.gov.au/statistics/economy/finance/household-income-and-wealth-australia/latest-release>.
- Barnes, J., Naser, M. M., & Aston, J. (2023). A vulnerability approach to irregular migration and modern slavery in Australia. *Australian Journal of Human Rights*, 29(1), 121–140. <https://doi.org/10.1080/1323238X.2023.2229619>.
- Bureau of Labor Statistics. (2024). *Glossary*. U.S. Department of Labor. <https://www.bls.gov/bls/glossary.htm>.
- Campbell, I. (2018). Temporary migrant workers, underpayment and predatory business models. In A. Stewart, J. Stanford, & T. Hardy (Eds.), *The wages crisis in Australia* (pp. 187–203). University of Adelaide Press. Retrieved from <https://www.jstor.org/stable/j.ctvb4bt9f.17>.

- Clemens, J., & Strain, M. R. (2020). Understanding "wage theft": Evasion and avoidance responses to minimum wage increases (Working Paper No. 26969). *National Bureau of Economic Research*. <http://www.nber.org/papers/w26969>.
- Cooper, D. and Kroeger, T. (2017) 'Employers steal \$15 billion a year from workers by paying less than the minimum wage' Economic Policy Institute Press Releases May 10, 2017 available at <https://www.epi.org/press/employers-steal-15-billion-a-year-from-workers-by-paying-less-than-the-minimum-wage/>.
- Cole, M., Stuart, M., Hardy, K., & Spencer, D. (2024). Wage Theft and the Struggle over the Working Day in Hospitality Work: A Typology of Unpaid Labour Time. *Work, Employment and Society*, 38(1), 103-121. <https://doi.org/10.1177/09500170221111719>.
- Fair Work Legislation Amendment (Closing Loopholes) Act 2023 (Cth). Available at: <https://www.legislation.gov.au/Details/C2023A00053>.
- Federal Bureau of Investigation. (2023). Crime in the United States 2022: Uniform Crime Reports. U.S. Department of Justice. Retrieved from <https://ucr.fbi.gov/crime-in-the-u.s/2023>.
- Ferris, E., & Ross, S. (2023). Decaffeinated resistance: Social constructions of wage theft in Melbourne's hospitality industry. *Journal of Criminology*, 56(1), 42-58. <https://doi.org/10.1177/26338076221115891>.
- Foley, M. and Piper, N. (2021). 'Returning home empty handed: Examining how COVID-19 exacerbates the non-payment of temporary migrant workers' wages' *Global Social Policy* 2021, 21(3), 468-489 <https://doi.org/10.1177/14680181211012958>.
- Fritz-Mauer, M. (2021) The Ragged Edge of Rugged Individualism: Wage Theft and the Personalization of Social Harm, 54 *U. Mich. J. L. Reform* 735 (2021). <https://doi.org/10.36646/mjlr.54.3.ragged>.
- Fussell, E. (2011). The Deportation Threat Dynamic and Victimization of Latino Migrants: Wage Theft and Robbery. *The Sociological Quarterly*, 52(4), 593-615. <https://doi.org/10.1111/j.1533-8525.2011.01221.x>.
- Galemba, R.B. "They Steal Our Work": Wage Theft and the Criminalization of Immigrant Day Laborers in Colorado, USA. *Eur J Crim Policy Res* 27, 91-112 (2021). <https://doi.org/10.1007/s10610-020-09474-z>.
- Galvin, D. J. (2021). Deterring Wage Theft: Alt-Labor, State Politics, and the Policy Determinants of Minimum Wage Compliance. *Perspectives on Politics*. <https://doi.org/10.1017/S1537592716000050>.
- Harkins, B. (2020). Base Motives: The case for an increased focus on wage theft against migrant workers, *Anti-Trafficking Review*, 15, 42-62, <https://doi.org/10.14197/atr.201220153>.
- International Labour Organization. (2012). *General Survey concerning the Forced Labour Convention, 1930 (No. 29), and the Abolition of Forced Labour Convention, 1957 (No. 105)*. International Labour Office.
- International Monetary Fund. (2015). *Causes and consequences of income inequality: A global perspective* (IMF Staff Discussion Note No. SDN/15/13). <https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf>.
- Kim, J and Allmang, S. (2020-21). Wage Theft in the United States: A Critical Review, *The Center for Women and Work Working Paper Series* https://smlr.rutgers.edu/sites/default/files/Documents/Centers/CWW/Publications/wage_theft_in_the_united_states_a_critical_review_june_2020.pdf.
- Lebaron G. (2021). Wages: An Overlooked Dimension of Business and Human Rights in Global Supply Chains. *Business and Human Rights Journal*. 6(1),1-20. <https://doi.org/10.1017/bhj.2020.32>.
- Levin, B. (2021). Wage theft criminalization. *UC Davis Law Review*, 54(3), 1429-1481.
- Marin-Guzman, D. (2023, March 20). 'Inexplicable' Victorian wage theft laws face High Court challenge. *Financial Review*. <https://www.afr.com/work-and-careers/workplace/high-court-challenge-to-wage-theft-laws-20230320-p5ctja>.
- Nikoloudakis, I., & Ranieri, S. (2023). Criminalising 'wage theft' in Australia: A proposed regulatory model. *Journal of Australian Law*, 18(2), 123-145. <https://doi.org/10.1234/jal.2023.56789>.
- Organisation for Economic Co-operation and Development. (2024). *OECD staff rules*. https://www.oecd.org/careers/Staff_Rules_EN.pdf.
- Raghunandan, A. (2021). Financial misconduct and employee mistreatment: Evidence from wage theft. *Review of Accounting Studies*, 26(3), 867-905. <https://doi.org/10.1007/s11142-021-09592-1>.

- Saha, D., Bhue, C., & Singha, R. (2024). *Rising wage theft in tea industry: consequences of ineffective labor market institutions*. *Labor History*, 65(1), 23–39. <https://doi.org/10.1080/0023656X.2023.2243472>.
- Segarra, P., Prasad, A. Undocumented immigrants at work: invisibility, hypervisibility, and the making of the modern slave. *Humanities and Social Sciences Communications* 11, 45 (2024). <https://doi.org/10.1057/s41599-023-02449-5>.
- Special Broadcasting Service (SBS). (2023, April 27). *Wage theft victims detail their rocky journey claiming their workplace rights*. SBS. <https://www.sbs.com.au/language/chinese/en/article/wage-theft-victims-detail-their-rocky-journey-claiming-their-workplace-rights/bdt8ujr5g>.
- United Nations. (1948). *Universal Declaration of Human Rights*. Retrieved from https://www.ohchr.org/sites/default/files/UDHR/Documents/UDHR_Translations/eng.pdf.
- United States Department of State. (2023). *2022 Country reports on human rights practices: Malaysia*. Retrieved from <https://www.state.gov/reports/2022-country-reports-on-human-rights-practices/malaysia/>.
- Victorian Government. (2024, March 5). *Victoria's wage theft laws*. <https://www.vic.gov.au/victorias-wage-theft-laws>.

INFLUENCE OF SUBJECTIVE NORMS ON SHAPING CONSUMER PURCHASE INTENTIONS: A STRUCTURED REVIEW

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ABSTRACT

The study explores the influence of subjective norms on shaping consumer purchase intentions, focusing on how social influence impacts decision-making across diverse contexts. Subjective norms, derived from the perceived social pressure to engage in or refrain from a particular behavior, are critical in understanding consumer behavior. Despite the extensive research on factors influencing purchase intentions, the role of subjective norms has remained relatively underexplored. This systematic literature review addresses this gap by analysing empirical findings from recent studies, applying a structured methodology guided by the PRISMA framework. The data is collected from reputable databases, ensuring a comprehensive selection of relevant literature. To achieve this, we extensively searched scholarly articles from reputable databases such as Scopus and Science Direct, focusing on studies published between 2022 and 2024. The flow of study based on PRISMA framework. The database found (n=34) final primary data was analysed. The finding was divided into three themes which is (1) Consumer Behaviour and Purchase Intentions, (2) Environmental and Ethical Consumption and (3) Social Influence and Technological Factors Based. The review uncovers consistent evidence that subjective norms, when combined with factors such as attitudes, perceived behavioural control, and social media influence, strongly shape purchase behaviour. Moreover, the moderating role of

social groups, and technological adoption is highlighted, demonstrating the complexity of the decision-making process. This review underscores the necessity for marketers and policymakers to consider subjective norms as a pivotal factor in predicting and influencing consumer behaviour, with implications for developing more targeted and effective marketing strategies.

INTRODUCTION

In the realm of consumer behavior, understanding the underlying factors that shape purchase intentions is paramount for marketers and researchers alike. One of the key factors that significantly influences consumer intentions is subjective norms. These norms, defined as the perceived social pressures to engage or not engage in certain behaviors, have long been recognized as vital in the decision-making process (Maehle & Skjeret, 2022) and it is therefore necessary to understand the determinants influencing consumers' behaviour for microalgae-based food. The current study explores the influence of various factors on consumers' attitude, purchase intention and willingness to pay for two microalgae-based products (bread and beer). Subjective norms stem from individuals' perceptions of the expectations of others, such as family, friends, or society at large, and the desire to conform to these expectations in order to gain social acceptance or avoid disapproval (Hensel et al., 2012) 1991, p. 188. This concept is especially relevant in today's interconnected and socially driven marketplace, where consumers are often swayed by their peers' and social networks' opinions and behaviors.

The Theory of Planned Behavior (TPB) is one of the most prominent frameworks for examining the influence of subjective norms on consumer purchase intentions (Izquierdo-Yusta et al., 2022).

According to TPB, an individual's intention to perform a behavior is influenced by three main components: attitude toward the behavior, perceived behavioral control, and subjective norms (Cheng, 2020; Nogueira et al., 2023). Among these, subjective norms refer to the belief that important others expect the individual to perform or refrain from performing a specific behavior, which, in turn, shapes the individual's behavioral intentions. When applied to consumer behavior, subjective norms highlight how perceived social expectations can drive individuals to make purchase decisions that align with the preferences or approval of their social group.

In the context of modern consumerism, subjective norms play a particularly crucial role in shaping purchase intentions for a wide range of products and services (Lombardi et al., 2024). For instance, in fashion, technology, and lifestyle products, consumers are often guided by what is socially acceptable or trendy within their reference groups. This influence is further amplified by the rise of social media platforms, where individuals are exposed to constant feedback from peers, influencers, and brands, shaping their perceptions of desirable products (Jaitly & Gautam, 2021). Whether it's purchasing the latest smartphone, following a sustainable brand, or adopting a particular diet, subjective norms contribute to the decision-making process by reinforcing socially endorsed behaviors.

This structured review aims to delve into the multifaceted role of subjective norms in shaping consumer purchase intentions. By systematically examining empirical studies and theoretical models, this article seeks to uncover the extent to which subjective norms influence consumer behavior and the underlying mechanisms at play. The review will explore

how subjective norms vary across personal values, attitudes, and perceived behavioral control. Moreover, understanding the influence of subjective norms on purchase intentions can offer practical insights for marketers seeking to leverage social influence in their campaigns. Marketers can craft more effective strategies that resonate with target audiences by identifying the key social referents and understanding how they shape consumer perceptions. Additionally, this analysis will contribute to the broader discourse on consumer behavior, highlighting the continued relevance of social influences in an increasingly digital and socially connected marketplace. Ultimately, this review will provide a comprehensive understanding of the role of subjective norms in shaping consumer purchase intentions, offering valuable insights for both academic research and practical applications in marketing and consumer engagement.

LITERATURE REVIEW

The influence of subjective norms on shaping consumer purchase intentions is a multifaceted topic that has been explored through various theoretical frameworks and methodologies. One prominent theory that consistently emerges in research is the Theory of Planned Behavior (TPB), which highlights the role of subjective norms, attitudes, and perceived behavioral control in influencing behavioral intentions. For instance, Sharma (2022) expanded the TPB framework to understand consumer intentions to purchase energy-efficient products in India. The study discovered that subjective norms, when combined with ethical consciousness and perceived behavioral control, significantly affected the consumer's intention to adopt energy-efficient products. Similarly, Zhang et al. (2024) found that social

norms significantly predicted green consumption intentions among young Chinese consumers. The research utilized a two-stage PLS-SEM-ANN approach to reveal that social norms ranked third in influencing green consumption intentions, further demonstrating the importance of normative influence in shaping sustainable purchasing behaviors. Additionally, Li et al. (2024) extended the TPB to include moral obligation as a factor influencing the intention to comply with China's AI Generated Content Law, again underlining the powerful effect of societal expectations on individual behavior. These studies collectively emphasize that subjective norms play a critical role in shaping consumer purchase intentions across different contexts, such as energy efficiency, green consumption, and compliance with regulatory laws.

Research on consumer trust further solidifies the impact of subjective norms on purchase intentions. For example, Abror et al. (2022) investigated the role of perceived risk in influencing tourist trust, showing that perceived value and religiosity moderated the relationship between perceived risk and trust, thus indirectly shaping purchase intentions. The findings suggest that tourists' trust in destinations is closely linked to social expectations and religious norms, further affecting their decision to revisit or recommend those places. Similarly, Kusuma et al. (2022) explored the moderating effect of subjective norms in shaping consumer trust and purchase decisions regarding organic food labels. The study demonstrated that trust in organic food labels, driven by perceived knowledge and mass media exposure, was significantly influenced by societal norms and expectations. These findings are consistent with the work of Kok Fei and Kar Yi (2023), who found that mass media and perceived knowledge shaped

by societal norms were crucial in building consumer trust in organic food labels. Together, these studies underscore those subjective norms, reinforced by societal structures such as media and religious beliefs, profoundly impact consumer trust and subsequent purchase intentions.

In the realm of mobility services, subjective norms have also been shown to significantly influence consumer intentions. Zhang et al. (2022) conducted an empirical study focusing on ridesharing services and revealed that intrinsic motivations, which are often aligned with societal expectations, play a crucial role in shaping consumers' willingness to switch from solo driving to ridesharing. Trust and habit, both influenced by extrinsic and intrinsic motivations, were found to be significant mediators in this process. This finding aligns with the results of Wibowo et al. (2022), who studied the influence of education level on halal food purchase decisions among Indonesian millennials. The research highlighted the importance of subjective norms in shaping the decision-making process, particularly when mediated by knowledge and trust. These studies illustrate that subjective norms, whether related to environmental responsibility or religious obligations, influence purchase intentions across diverse sectors.

Sustainable consumption, another area where subjective norms are highly relevant, has been a growing concern for both researchers and marketers. The study by Hong et al. (2024) examined sustainable fashion consumption (SFC) and found that personal norms, social norms, and trust in recycling were significant predictors of sustainable fashion consumption intentions (SCI). This research confirms that subjective norms, as part of a broader value-belief-norm framework, substantially shape consumer

intentions towards more sustainable behaviors. Zhang et al. (2024) reinforced this perspective by showing that young consumers' green consumption behaviors are not only influenced by personal beliefs but also heavily shaped by the norms and expectations of their social circles. Such findings suggest that marketers aiming to promote sustainable consumption should focus on creating and reinforcing social norms that support environmentally responsible behaviors.

Subjective norms also play a role in influencing purchase intentions related to emerging technological regulations. Li et al. (2024) extended the TPB to explore factors affecting compliance with China's AI Generated Content Law and found that subjective norms, along with moral obligations and perceived behavioral control, were significant predictors of compliance intentions. These findings echo previous research on the influence of societal expectations on compliance behaviors, demonstrating the broader applicability of subjective norms in shaping purchase and compliance intentions across various regulatory and technological landscapes.

The influence of subjective norms on consumer purchase intentions has been a focal point in numerous studies, each examining different contexts and variables. Subjective norms, derived from the Theory of Planned Behavior (TPB), describe the perceived social pressure to engage or refrain from a particular behavior (Ajzen, 1991). They are formed by the individual's perception of how their important referents—such as friends, family, or society at large—view the behavior in question. Taylor et al. (2023) explored how subjective norms influence the purchasing decisions of young Australian women in the context of second-hand clothing. Their study found that

social approvers, primarily close friends and family members, significantly shaped the women's purchase decisions. Similarly, Sun et al. (2022) in their study on COVID-19 vaccine attitudes noted that perceived social norms within online communities were pivotal in shaping positive attitudes toward vaccination. These studies align with the findings of Mensah et al. (2023), who identified subjective norms as a significant determinant of Chinese university students' entrepreneurial intentions. In all these cases, the power of social pressure and the influence of one's close circle are paramount in shaping consumer behavior.

The role of subjective norms extends beyond the purchase of consumer goods to more substantial decisions like adopting sustainable practices and new technologies. Pai et al. (2023) investigated the impact of environmental awareness and subjective norms on the adoption of battery electric vehicles (BEVs) in Taiwan. Their findings suggest that social approval of eco-friendly practices and growing environmental concerns significantly influence consumer attitudes toward BEVs. Similarly, Ruan et al. (2022) found that in the context of green events, ecological beliefs and social conformity were vital in driving event participation and promoting sustainable behavior. This highlights the effectiveness of integrating subjective norms into strategies aimed at encouraging the adoption of sustainable consumption habits. The convergence of these studies underscores that whether purchasing everyday goods or making more impactful decisions like vehicle purchases, subjective norms consistently play a significant role in shaping consumer intentions toward sustainability.

Further elaborating on the significance of subjective norms, Nguyen and Dao (2024) examined the role of these norms in mobile banking adoption in Vietnam. Although their findings indicated that subjective norms were

not a direct influencer of continuance intention in mobile banking, the study highlighted how trust and perceived usefulness could enhance the effect of social influence. In contrast, the research by Wang et al. (2023) on green food consumption demonstrated that subjective norms positively impacted green food repurchase intentions. Consumers who perceived social pressure to buy green products were more likely to align their behavior with these expectations, especially when combined with positive consumer experiences. This pattern of influence was also observed in a cross-generational study by Chen et al. (2024), where both Gen Z and Gen Y displayed similarities in their green food consumption behaviors. Subjective norms were found to be crucial across both generations, although the motivations varied. Therefore, subjective norms' impact on consumer behavior can manifest differently across various sectors but remains a constant influence in both technological and consumer product contexts.

The interaction between subjective norms and other psychological constructs has also been explored. Zhang and Liu (2023), in their study on brand storytelling and attitudes in B2C e-commerce platforms for organic agricultural products, discovered that subjective perceptions of authenticity and familiarity with regional brands can mediate the effect of subjective norms on brand attitudes. Meanwhile, Lyu et al. (2024) focused on social entrepreneurial intentions among Chinese university students and noted that subjective norms—combined with personal attitudes and entrepreneurial self-efficacy—are essential in shaping students' intentions to pursue social entrepreneurship. These studies reflect a growing interest in how subjective norms intersect with individual perceptions and attitudes to guide consumer and entrepreneurial behaviors in different contexts.

Conclusively, subjective norms broadly and significantly impact shaping consumer purchase intentions across various contexts. The influence of social pressure is evident in the adoption of sustainable practices, technology, or consumer goods. It is important to note that while subjective norms are powerful motivators, their effectiveness is often moderated by other variables such as trust, perceived behavioral control, and personal attitudes. The intersectionality of these factors, as seen across diverse studies, provides a holistic understanding of how subjective norms function in different scenarios. These insights offer valuable directions for future research and practical applications in understanding and influencing consumer purchase intentions.

RESEARCH QUESTIONS

In this paper, the PICO is used to formulate research questions. PICO stands for Population, Interest, and Context (Nishikawa, 2022). Here's what each component means:

1. Population (P). This refers to the group or participants of interest in the study. It specifies who the research is focused on, such as a specific demographic, patient group, or community.
2. Interest (I). This represents the main focus or phenomenon of interest in the study. It could be a particular experience, behavior, intervention, or issue that the research aims to explore or understand.
3. Context (Co). This defines the setting, environment, or specific context in which the population and interest are situated. It might refer to geographical location, cultural or social settings, or any other relevant backdrop for the research.

Below are the two research questions for this study:

1. How do subjective norms influence consumers' purchase intentions across different product categories?
2. How do subjective norms affect social media users' intentions to adopt new technologies or platforms?

METHODOLOGY

The PRISMA framework is organized into four essential stages: identification, screening, eligibility, and data abstraction. The identification phase involves systematically searching databases to locate all relevant studies. During the screening phase, these studies are evaluated against established criteria to eliminate irrelevant or insufficient quality. The remaining studies are scrutinized in the eligibility phase to ensure they meet the specific inclusion criteria. Finally, information from the included studies is meticulously extracted and synthesized in the data abstraction phase, forming the foundation for drawing reliable and significant conclusions (Page et al., 2021). This rigorous process ensures that the systematic review is conducted with the highest standards, yielding results that can effectively guide both future research and practical applications.

Identification.

This study employed fundamental steps of the systematic review process to collect a significant volume of relevant literature. The process commenced with identifying key terms, followed by exploring related concepts using various resources such as dictionaries, thesauri, encyclopedias, and prior academic works. Once all relevant terms were gathered, search strings were constructed specifically for use in the Science Direct and Scopus databases. As a result, the initial stage of the systematic review

generated a total of 5,035 publications relevant to the study's subject matter from these two databases.

Screening

During the screening step, potentially relevant research items are evaluated to ensure they align with the predefined research question(s). The first stage of the study rejected 4847 papers and record after screening is 188. Whereas the second stage screened 25 papers based on the scholars' various exclusion and inclusion criteria. As literature (research articles) is the major source of practical advice, it was the first criterion used. It also covers systematic reviews, reviews, meta-synthesis, meta-analysis, books, book series, chapters, and conference proceedings excluded from the latest research. Furthermore, the review was limited to English-language publications. It is important to keep in mind that the plan was established for the past three-year period (2022-2024). In all, 34 publications were eliminated predicated on particular criteria.

Eligibility

The third stage of the process, referred to as the eligibility phase. A total of 163 articles are included in the third level, called eligibility. At this stage, all article titles and important text were carefully scrutinized to confirm that the inclusion criteria were satisfied and that the articles were appropriate for the current study's research objectives. As a result, 129 papers were removed since their title and abstract were not significantly relevant to the study's objective based on empirical data. Finally, 34 articles have been made available for review

Data Abstraction and Analysis.

This study employed integrative analysis as a key assessment strategy to examine and synthesize a variety of research designs, particularly utilizing quantitative methods. The primary aim of the expert study was to identify relevant themes and sub-themes. The initial phase of this process involved data collection, which was foundational to the development of these themes. As shown in Figure 1, the authors carefully reviewed a collection of 34 publications to identify statements or content pertinent to the topics of this study.

In this phase, the authors evaluated the influence of subjective norms, which played a central role in identifying and establishing key thematic groupings. Two main topics emerged from this approach: detection and classification impact. From this point, the authors further developed each identified theme, along with any related concepts or ideas. The lead author collaborated with co-authors to refine these themes based on the evidence gathered in this study's context. Throughout the data analysis process, the authors maintained a log to document any analyses, insights, challenges, or reflections that were significant to interpreting the data. The authors compared results to identify any inconsistencies in the theme development process. Any conceptual disagreements were resolved through discussions among the authors, with final themes adjusted to ensure coherence. The analysis was conducted by two experts, one specializing in marketing and the other in management, to validate the identified issues. This expert review phase contributed to establishing domain validity by ensuring each sub-theme's clarity, relevance, and appropriateness. Based on the experts' feedback and professional insights, the lead author made further revisions to enhance the rigor of the thematic analysis.

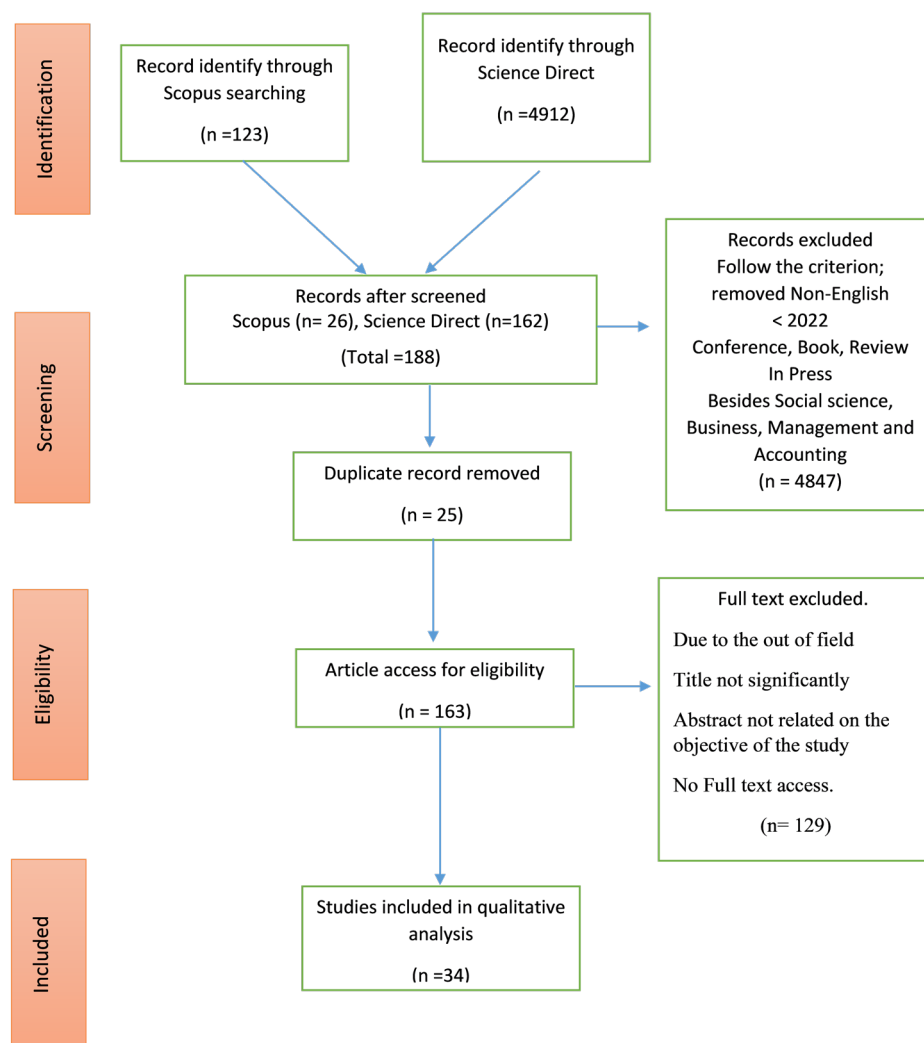


Figure 1 Flow diagram of the proposed searching study

QUALITY OF APPRAISAL

In line with the guidelines set forth by Kitchenham and Charters (Kitchenham, 2007), after selecting primary studies (PSs), the next step is to evaluate the quality of the research they represent and compare them quantitatively. This study applies the quality assessment framework proposed by Anas Abouzahra et al. (Abouzahra et al., 2020), which consists of six quality assessment (QA) criteria tailored for our systematic literature review (SLR). The assessment involves a scoring method where each criterion is rated as follows: "Yes" (Y) is given a score of 1 when the criterion is fully met, "Partly" (P) receives

a score of 0.5 when the criterion is partially met but exhibits some gaps, and "No" (N) is assigned a score of 0 when the criterion is not fulfilled.

The quality assessment process is conducted by three experts, who evaluate the study based on the outlined criteria. Each criterion is assigned a rating of "Yes," "Partly," or "No" according to the degree to which it is satisfied, ensuring a systematic and structured evaluation of the research quality. Each expert independently assesses the study according to these criteria, and the scores are then totalled across all experts to determine the overall mark. For a study to be accepted for the next

process, the total mark, derived from summing all three experts' scores, must be 3.0. This threshold ensures that only studies meeting a certain quality standard proceed further.

Table 1 Quality of Appraisal

Quality Assessment	Expert 1	Expert 2	Total Mark
Is the purpose of the study clearly stated?	Y	Y	3
Is the interest and the usefulness of the work clearly presented?	Y	Y	3
Is the study methodology clearly established?	Y	Y	3
Are the concepts of the approach clearly defined?	Y	Y	3
Is the work compared and measured with other similar work?	Y	Y	3

FINDINGS

THEME 1: CONSUMER BEHAVIOR AND PURCHASE INTENTIONS

The influence of subjective norms on shaping consumer purchase intentions is evident across various consumer behaviors. The findings from Sadeli et al. (2023) emphasize the role of information-seeking behavior, which significantly contributes to shaping the perceived sustainability of short food supply chains (SFSCs). This perception positively influences attitudes toward SFSCs, which, in turn, heightens purchase intention. However, subjective norms were found to have a negligible effect on purchase intention when consumers already possess ample information, underscoring the paramount importance of knowledge dissemination. Similarly, Zhao et al. (2023) reveal that subjective norms, in conjunction with platform innovation characteristics, considerably influence consumer purchase behavior in social commerce. Their findings indicate that subjective norms and a critical

mass of users significantly impact purchase intentions, especially in the early stages of adoption. In this context, social influence plays a mediating role, shaping how trust and platform characteristics affect behavior. This suggests that subjective norms play a critical role in reinforcing consumer trust and facilitating social commerce adoption.

Building on the same theme, Bergamaschi et al. (2022) investigate how subjective norms shape young consumers' intentions to purchase green products. They highlight that environmental affect (EA) significantly influences the subjective norms that dictate consumer attitudes toward green products. The study found that EA influences attitudes and enhances perceived behavioral control and subjective norms, which are instrumental in driving purchase intentions. These findings reveal that emotional and cognitive factors intertwine to shape purchase behaviors, further supporting the notion that subjective norms significantly influence consumer choices. This conclusion aligns with the work of Cheah et al. (2024), who demonstrate that subjective norms positively affect consumers' intentions to purchase e-deals. The authors found that the influence of subjective norms is magnified when combined with anticipatory regret, especially in price-conscious consumers. Thus, the social expectations regarding the value of deals play a critical role in shaping purchase intentions. Patthirasinsiri (2023) expands on this by focusing on consumer intentions toward organic herb cordyceps. His study found that subjective norms, alongside perceived behavioral control and attitudes toward organic products, strongly influence consumer purchase intentions. The findings suggest that increased awareness of the health benefits of organic products, driven by subjective norms, significantly elevates consumer intention to adopt these products. As consumers receive more information about the benefits of organic herbs, subjective norms gain more influence over their decision-making

processes. This is consistent with the findings from the earlier studies that emphasize the pivotal role of information dissemination and subjective norms in shaping consumer behaviors, especially in areas related to health and sustainability.

In recent years, subjective norms have emerged as a pivotal factor in shaping consumer purchase intentions, with diverse influences based on cultural contexts, product types, and market dynamics. For instance, Huo et al. (2023) explored the role of subjective norms in the purchasing behavior of Chinese consumers towards organic food, highlighting that subjective norms, alongside attitudes and perceived behavioral control, significantly influence purchase intentions. This pattern was similarly observed by Mohammed (2024), where subjective norms had a critical impact on the purchase behavior of young Saudi consumers toward local coffee products. Both studies reveal that consumer ethnocentrism and trust in supply chains play moderating roles, reinforcing the centrality of subjective norms in shaping intention and behavior across different cultural backgrounds. In the realm of ethical consumption, Robichaud and Yu (2022) extended these findings to Generation Z's purchase of fair-trade coffee, where subjective norms played a crucial role in promoting ethical behavior. Their study showed that peer influence and social media presence amplify these norms, driving young consumers towards sustainable choices. Additionally, Van Tonder et al. (2023) emphasized that subjective norms exert substantial influence on green consumer citizenship behaviors. They demonstrated that social pressure to conform to environmentally friendly behaviors and internal values motivate consumers to adopt green practices.

Moreover, Mat Dawi et al. (2024) and Ying Sun et al. (2023) observed the integration of subjective norms with other psychological and situational variables. In Mat Dawi's (2024) study on online purchasing behavior during the COVID-19 pandemic, subjective norms

were identified as significant influencers in the intention to purchase online, while social distancing moderated their effect. Similarly, Ying Sun et al. (2023) found that subjective norms, product knowledge, and social media marketing were pivotal in driving Chinese consumers' green product purchases in the post-pandemic era. Interestingly, the role of subjective norms is not limited to influencing purchasing intentions but also extends to fostering brand loyalty and consumer citizenship behaviors. Izquierdo-Yusta et al. (2023) analyzed how subjective norms, food values, and brand love significantly predict behavioral loyalty in the fast food industry. Their findings suggest that subjective norms can enhance brand attachment, driving repeated purchases and long-term loyalty. These conclusions are supported by D'Souza (2023), who found that subjective norms, although moderated by factors like food neophobia, directly influence consumer choices in less conventional product categories like game meats.

Recent studies emphasize the substantial role of subjective norms in influencing consumer purchase intentions, particularly when paired with other cognitive, emotional, and situational factors. D'Souza (2023) highlights that subjective norm, within the Theory of Planned Behavior (TPB), significantly contribute to consumer decisions regarding non-conventional products like game meat. The study reveals that subjective norms and social and epistemic values strongly predict consumer intentions. However, these intentions are moderated by food neophobia/neophilic behavior, which can either enhance or diminish the likelihood of actual purchase behavior. Furthermore, the study demonstrates that consumers' perceived well-being mediates the relationship between their intentions and actual purchases, signaling a complex interplay between subjective norms, personal values, and behavioral outcomes. Similarly, Izquierdo-Yusta et al. (2023) extend the TPB framework by incorporating food values and brand love

into the analysis of consumer loyalty behaviors in fast food consumption. This research confirms that subjective norms directly influence intentions and loyalty, particularly in settings where emotional attachment to a brand (i.e., brand love) plays a significant role. The inclusion of these emotional variables provides a deeper understanding of how subjective norms operate within the broader context of consumer decision-making processes, particularly in high-engagement categories like food services. The findings suggest that the influence of subjective norms extends beyond the initial purchase to foster continued engagement and loyalty, especially when aligned with the consumer's emotional and value-driven connections to a brand. D'Souza (2023) and Izquierdo-Yusta et al. (2023) collectively underscore the nuanced role those subjective norms play across different consumption contexts. Both studies utilize structural equation modeling to demonstrate that subjective norms strongly influence intentions and behaviors, though moderated by individual traits such as food neophobia and emotional attachment. In these cases, subjective norms serve as a social force that aligns consumer behaviors with broader societal expectations, driving both purchase decisions and post-purchase behaviors like loyalty.

In summary, subjective norms consistently emerge as a vital determinant of consumer purchase intentions across various product categories and cultural contexts. Whether in the context of organic food, fair-trade coffee, online shopping, or green products, subjective norms act as a powerful driver of behavior, often moderated by other psychological and social factors. These findings collectively underscore the need for marketers and policymakers to consider the significant impact of social influence when developing strategies to promote sustainable and ethical consumption. These studies collectively demonstrate that subjective norms profoundly impact consumer purchase

intentions across diverse product categories and consumer segments. Whether it involves social commerce, green products, or organic herbs, subjective norms interact with other psychological and social factors such as trust, environmental affect, and knowledge to shape consumer behaviors. Effective communication strategies that leverage social influence and foster information sharing can significantly amplify the role of subjective norms in shaping consumer purchase decisions.

THEME 2: ENVIRONMENTAL AND ETHICAL CONSUMPTION

Research on environmental and ethical consumption has provided substantial insights into the factors shaping consumer purchase intentions, particularly under the influence of subjective norms. Liang et al. (2024) demonstrate that environmental awareness and health consciousness significantly influence green consumption, particularly regarding green furniture. Their findings reveal that attitudes, subjective norms, and perceived behavioral control positively impact green purchase intentions. The role of subjective norms is crucial as social pressure from peers or society encourages consumers to conform to sustainable consumption practices. Additionally, their study highlights the interaction between personal conditions, such as education and income levels, and environmental consciousness in fostering pro-environmental behaviors. This suggests that subjective norms and heightened environmental awareness significantly drive consumer decisions toward green products. Similar to this, Harun et al. (2022) investigate the purchase intentions for energy-efficient appliances among Malaysian households. Their research identifies subjective norms as a significant determinant of these intentions, reinforcing the notion that social influence plays a vital role in encouraging sustainable consumption. However, the study also uncovers that while subjective norms exert substantial influence, attitudes toward

energy-efficient appliances do not. This reflects the idea that consumers may still make environmentally responsible choices despite personal attitudes when influenced by social pressures, particularly through social interactions and the perceived quality of the appliances. Hence, the study supports the pivotal role of subjective norms in shaping energy-efficient purchasing behaviors even in the absence of positive attitudes.

Bigliardi et al. (2022) explore consumers' intentions to purchase refurbished smartphones in the context of electronic waste management and circular economy. Their findings diverge slightly, as social and emotional factors, including subjective norms, have minimal influence on purchase intentions for refurbished products. Instead, environmental knowledge and perceived value appear to be stronger predictors. While subjective norms are often a driving force in sustainable consumption, this study indicates that in certain markets, environmental awareness and perceived utility can surpass social influences, suggesting variability in the strength of subjective norms across different product types and consumption contexts. Bhutto et al. (2022) further reinforce the significance of subjective norms in energy-efficient appliance consumption, particularly among younger consumers in developing economies. Their study extends the Theory of Planned Behavior by incorporating moral obligations and self-expressive benefits into the framework, revealing that subjective norms strongly influence the adoption of energy-efficient appliances. The findings highlight the importance of moral and social considerations in shaping consumer behavior, particularly when consumers feel pressured by societal expectations to conform to environmentally friendly consumption practices. This research underscores the critical role of subjective norms and their interaction with personal moral obligations in promoting sustainable purchasing behaviors among young consumers.

The theme of environmental and ethical consumption has been extensively explored in various studies, highlighting the complex interplay of subjective norms, personal beliefs, and social influences in shaping consumer purchase intentions. Research by Suk et al. (2022) delves into the low-cost carrier (LCC) market, revealing that subjective norms and self-congruence significantly moderate the relationship between customer purchase intentions and service offerings. The study finds that negative perceptions of being "cheap" hinder purchase intentions despite the low-price advantage. This aligns with the notion that subjective norms can affect consumers' behavior, as they seek social approval or validation in their choices, especially when competing offerings provide higher perceived value.

In the realm of digital marketing, the study by Kim and Park (2024) focuses on virtual influencers and their anthropomorphic qualities, which positively influence consumer satisfaction. Their research identifies that subjective norm, particularly those surrounding the increasing usage of virtual celebrities, create a framework where consumers are swayed by perceived credibility and usefulness. This influence of subjective norms on ethical consumption in digital spaces underscores the growing importance of peer perceptions in non-traditional consumption environments, further illustrating how social constructs can drive purchase intentions in novel markets. Andonopoulos et al. (2024) investigate the authenticity of social media influencers (SMIs) and their impact on consumer behavior. Interestingly, their research demonstrates that authenticity is not always a prerequisite for influencing purchase intentions. Even inauthentic SMIs can inspire consumers and positively impact hedonic product purchases, suggesting that subjective norms surrounding social media influence, regardless of authenticity, play a critical role in shaping consumer behavior. This finding contributes to the broader understanding of

how social media dynamics and influencers' roles in ethical consumption evolve under the pressure of subjective norms and perceived authenticity.

In post-pandemic scenarios, the study by Liu et al. (2023) introduces the concept of revenge buying, leveraging the stimulus–organism–response (SOR) framework alongside the theory of planned behavior (TPB). Their findings indicate that perceived scarcity and social influence during lockdowns can lead to heightened anxiety, thereby triggering revenge buying. This reflects the critical role of subjective norms in amplifying consumer behavior under distressing conditions, further affirming the powerful impact of social pressure in shaping consumer decisions, especially in the aftermath of global crises. The rise in such behaviors reveals the intricate relationship between subjective norms and environmental consumption, as consumers react to perceived social cues. Similarly, Zhou and Liu (2023) analyze consumer behavior in online vegetable distribution terminals, integrating perceived risk and terminal image within the TPB framework. The study finds that while subjective norms do not directly influence behavioral intention in this context, perceived social pressures and behavioral controls still play a critical role in consumer decision-making. This highlights the variability in how subjective norms impact different consumption behaviors, particularly in ethical consumption related to everyday goods. Social norms do not always sway consumers unless these align with personal perceptions of risk and reward, particularly in online retail environments where immediacy and convenience dominate.

In summary, these studies collectively emphasize the diverse impact of subjective norms across various environmental and ethical consumption domains. Whether in low-cost air travel, digital marketing with virtual influencers, social media influence, post-lockdown revenge buying, or online food

purchasing, subjective norms consistently emerge as a significant factor influencing consumer behavior. The interplay between these norms and other personal or social factors, such as perceived value, authenticity, and social pressures, provides a comprehensive understanding of how ethical consumption is shaped in today's dynamic market.

THEME 3: SOCIAL INFLUENCE AND TECHNOLOGICAL FACTOR BASE

The adoption of energy-efficient appliances (EEA) is another area where subjective norms have been found to exert a considerable influence. Harun et al. (2022) explored the role of social interaction and product quality in determining consumer intentions toward EEAs among Malaysian households. Their study identified subjective norms and perceived behavioral control as critical factors driving the intention to purchase EEAs, while individual attitudes had no significant impact. This pattern suggests that societal influences, particularly those related to social interactions, play a decisive role in shaping consumer behavior towards environmentally friendly products. The role of subjective norms in guiding purchase behavior emphasizes the importance of social validation and collective responsibility in environmental consumption.

The green purchase intention of refurbished smartphones was investigated by Bigliardi et al. (2022), where environmental knowledge and green perceived value were found to be dominant factors. In this context, subjective norms, collectivism, and emotional factors did not significantly influence green purchase intentions. This highlights a variation in the impact of subjective norms across different product categories, suggesting that while social influences may drive some forms of green consumption, other factors such as personal environmental knowledge and perceived value take precedence in influencing consumer decisions in the refurbished electronics market.

Further extending the theory of planned behavior (TPB), Bhutto et al. (2022) examined the role of subjective norms and additional variables such as moral obligation in shaping young consumers' purchase behavior of energy-efficient appliances in Pakistan. The results indicated that while utilitarian environmental benefits significantly influenced attitudes, subjective norms were not impacted by moral obligations. This suggests that subjective norms regarding environmental behavior are more strongly influenced by social values and perceived benefits rather than personal moral considerations. This divergence from traditional expectations underlines the complex nature of subjective norms in shaping consumer behavior within the context of sustainability. In the secondary sneaker market context, Slaton and Pookulangara (2022) used the theory of reasoned action (TRA) to investigate how popular culture and social media influence consumer purchase behavior. Their findings showed that subjective norms, driven by fashion consciousness and social media, significantly influence consumer intentions to purchase sneakers from secondary retailers. The influence of subjective norms in this market indicates the pervasive power of social validation and social media in shaping consumer behavior, even in industries not traditionally associated with environmental consumption. This underscores the broad applicability of subjective norms across various consumer sectors, particularly in markets where social trends and peer influence are prominent.

The role of subjective norms in shaping consumer purchase intentions is evident across a range of industries, including low-cost carriers (LCCs), digital marketing, and retail. Suk et al. (2022) explored the influence of subjective norms in the low-cost carrier market, revealing that subjective norms and self-congruence negatively moderate the relationship between customers' purchase intentions and their perceptions of service quality. This finding suggests that while LCCs

attract customers with low prices, subjective norms can create an unfavorable perception of the airline's service as "cheap." The negative association impacts purchase intentions, implying that LCCs must target the right consumer segments and shift attention away from price to other dimensions, such as customized service offerings and quality. Similarly, Kim and Park (2024) examined how digital celebrities' subjective norms and perceived anthropomorphism influence consumer satisfaction. In their study of virtual influencer endorsements, subjective norms and perceived anthropomorphism positively influenced satisfaction, although social presence did not mediate the relationship. This indicates that subjective norms regarding the perception of human-like qualities in virtual endorsers significantly impact consumer purchase behavior. Retailers benefit from utilizing virtual influencers by focusing on aspects such as credibility and usefulness, which align with consumer expectations shaped by social norms in the digital marketplace.

Moreover, Andonopoulos et al. (2024) discovered that subjective norms play a pivotal role even when social media influencers (SMIs) are perceived as inauthentic. Their study revealed that while authenticity enhances purchase intentions through trustworthiness and inspiration, inauthentic SMIs can still positively influence consumer behavior, particularly in the purchase of hedonic products. This finding challenges the traditional assumption that authenticity is essential for positive consumer responses, highlighting how subjective norms around perceived inspiration and social influence can override concerns about authenticity. Liu et al. (2023) introduced the concept of revenge buying in the aftermath of the COVID-19 lockdown, using the stimulus-organism-response (SOR) framework and the Theory of Planned Behavior (TPB) model. The study found that social influence, a form of subjective norms, played a critical role in

stimulating anxiety and subsequent revenge buying behavior. Influenced by perceived scarcity and social pressure, consumers developed strong purchase intentions to compensate for their limited consumption during the lockdown. These findings emphasize the role of subjective norms in driving consumer behavior during periods of crisis, suggesting that social influence can amplify emotional responses, leading to increased consumer spending. Finally, Zhou and Liu (2023) focused on consumer choice in online vegetable distribution, highlighting the complex interaction between subjective norms and perceived behavioral control. In this study, subjective norms did not significantly influence terminal behavioral intentions or choices, contrasting with findings in other industries. However, the results underscored the importance of perceived risk and terminal image in driving consumer behavior, implying that subjective norms may have a more limited impact in highly utilitarian and low-involvement purchase decisions, such as grocery shopping through online platforms.

These studies collectively demonstrate that subjective norms play a pivotal role in shaping consumer behavior across a variety of environmentally and ethically oriented consumption domains. Whether in the purchase of green furniture, energy-efficient appliances, refurbished electronics, or fashion items in niche markets like secondary sneakers, subjective norms often dictate consumer intentions. The variability in their influence across different sectors highlights the need for targeted strategies that account for both social and personal factors in promoting ethical and sustainable consumption. Meanwhile, subjective norms significantly shape consumer purchase intentions across a variety of sectors, including aviation, digital marketing, and post-pandemic consumption. While the extent of their influence varies depending on the product category and context, social influence and collective expectations consistently affect consumer behavior. These findings underline

the importance of understanding and leveraging subjective norms in developing marketing strategies that align with consumer perceptions and behaviors.

CONCLUSION

Subjective norms significantly impact consumer purchase intentions across a wide range of behaviors and product categories. Research highlights that subjective norm, combined with factors such as information-seeking behavior, perceived sustainability, and platform characteristics, play a crucial role in shaping attitudes and purchase intentions. For instance, in social commerce, subjective norms and the presence of a critical user mass greatly influence early adoption and purchase behavior, while in the context of green products, environmental affect enhances the role of subjective norms in shaping consumer attitudes and intentions. Further insights reveal that subjective norms extend beyond initial purchase intentions to affect brand loyalty and consumer citizenship behaviors. In various settings, including ethical consumption and online shopping, subjective norms interact with emotional and cognitive factors to drive both initial purchase decisions and long-term engagement. This underscores the importance of incorporating social influence into marketing strategies and policy development to promote sustainable and ethical consumption practices effectively.

The impact of subjective norms on consumer purchase intentions, particularly in the context of environmental and ethical consumption, has been extensively documented. Subjective norms significantly influence consumer behavior across various domains, including the adoption of green products, energy-efficient appliances, and refurbished electronics. Social pressures and societal expectations often drive consumers to make environmentally responsible choices, even when personal attitudes may not fully align with these behaviors. Research reveals

that while subjective norms play a critical role in shaping purchase intentions, their effectiveness is moderated by factors such as environmental awareness, perceived value, and product type. For instance, social influence has been shown to encourage green and energy-efficient purchases, but its impact can vary depending on the specific market and consumer segment. Additionally, in some contexts, such as the purchase of refurbished products, environmental knowledge and perceived utility may have a stronger influence than social pressures. Overall, understanding the role of subjective norms in consumer behavior necessitates considering the interplay between social influence, personal values, and contextual factors. Marketers and policymakers should account for these dynamics to effectively promote sustainable and ethical consumption practices.

The influence of subjective norms on consumer purchase intentions is substantial across various sectors, including environmental and ethical consumption. Studies highlight that subjective norms, or the social pressures and expectations from peers and society, significantly shape consumer behavior. In the realm of green and energy-efficient products, subjective norms often drive purchase intentions. For instance, in the market for green furniture, the interplay of environmental awareness, health consciousness, and social pressures impacts consumer decisions. Similarly, the adoption of energy-efficient appliances is strongly influenced by societal expectations and social interactions, even if personal attitudes are less significant. However, the influence of subjective norms varies by product type and market. In the case of refurbished electronics, factors such as environmental knowledge and perceived value are more influential than social pressures. Additionally, subjective norms related to fashion trends and social media significantly affect purchase behavior in contexts like secondary sneaker markets and digital marketing. The role of subjective

norms extends to various consumer behaviors, including online shopping, fashion choices, and post-pandemic spending patterns. The findings suggest that while subjective norms consistently impact consumer intentions, the degree of influence depends on the specific product category and context. Effective marketing strategies must consider these varying impacts and leverage subjective norms to align with consumer perceptions and behaviors across different sectors.

REFERENCES

- Abouzahra, A., Sabraoui, A., & Afdel, K. (2020). Model composition in Model Driven Engineering: A systematic literature review. *Information and Software Technology*, 125.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Andonopoulos, V., Lee, J. J., & Mathies, C. (2023). Authentic isn't always best: when inauthentic social media influencers induce positive consumer purchase intention through inspiration. *Journal of Retailing and Consumer Services*, 75.
- Bergamaschi, O. B. N., Ferraz, S. B., & Martins, R. M. (2022). "Young, wild and green?" analyzing the influence of environmental affect on young consumers' intent to purchase green products. *REMark*, 21(2), 232.
- Bhutto, M. Y., Soomro, Y. A., & Yang, H. (2022). Extending the theory of planned behavior: predicting young consumer purchase behavior of energy-efficient appliances (Evidence from Developing Economy). *Sage Open*, 12(1).
- Bigliardi, B., Filippelli, S., & Quinto, I. (2022). Environmentally-conscious behaviours in the circular economy. An analysis of consumers' green purchase intentions for refurbished smartphones. *Journal of Cleaner production*, 378.
- Cheah, I., Shimul, A. S., & 't Hart, B. (2024). Exploring e-deal proneness: the interplay of price consciousness and anticipatory regret. *Asia Pacific Journal of Marketing and Logistics*, 36(5), 1230-1247.
- Chen, H., Jung, W., & Yoon, S. (2022). Validating antecedent factors affecting ethical purchase behavior: Comparing the effect of customer citizenship versus corporate citizenship. *Sustainability*, 14(21).

- D'Souza, C. (2022). Game meats: Consumption values, theory of planned behaviour, and the moderating role of food neophobia/neophilic behaviour. *Journal of Retailing and Consumer Services*, 66.
- Hensel, B. K., Leshner, G., & Logan, R. A. (2012). Subjective Norm. *Consumer Health Informatics Research Resource (CHIRr)*.
- Huo, H., Sh. Ahmad, F., & Teoh, B. (2023). Evaluating the purchasing behavior of organic food among Chinese consumers. *Young Consumers*, 24(6), 669-685.
- Izquierdo-Yusta, A., Martínez-Ruiz, M. P., & Pérez-Villarreal, H. H. (2022). Studying the impact of food values, subjective norm and brand love on behavioral loyalty. *Journal of Retailing and Consumer Services*, 65.
- Jaitly, R. C., & Gautam, O. (2021). Impact of social media influencers on customer engagement and brand perception. *International Journal of Internet Marketing and Advertising*, 15(2), 220-242.
- Kasuma L., Wibowo, M. W., Putri, A. L. S., Hanafiah, A., Permana, D., & Sh Ahmad, F. (2022). How education level polarizes halal food purchase decision of Indonesian millennials. *Journal of Islamic Marketing*, 13(12), 2582-2610.
- Kim, H., & Park, M. (2024). When digital celebrity talks to you: how human-like virtual influencers satisfy consumer's experience through social presence on social media endorsements. *Journal of Retailing and Consumer Services*, 76.
- Kitchenham, B., & Charters, S. (2007). Guidelines for performing systematic literature reviews in software engineering version 2.3. *Engineering*, 45(4ve), 1051.
- Kok Fei, T. L., & Kar Yi, S. W. (2023). The Mediating Effects of Mass Media and Perceived Knowledge in Shaping Consumer Trust in Organic Food Labels. *Malaysian Journal of Consumer and Family Economics*, 31(1), 664-694.
- Li, J. C., Lin, Y., & Yang, Y. C. (2024). Extending the theory of planned behavior model to explain people's behavioral intentions to follow China's AI generated content law. *BMC psychology*, 12(1), 367.
- Liang, H., Wu, Z., & Du, S. (2024). Study on the impact of environmental awareness, health consciousness, and individual basic conditions on the consumption intention of green furniture. *Sustainable Futures*, 8.
- Liu, Y., Cai, L., Ma, F., & Wang, X. (2023). Revenge buying after the lockdown: Based on the SOR framework and TPB model. *Journal of Retailing and Consumer Services*, 72.
- Lombardi, A., Califano, G., Caracciolo, F., Del Giudice, T., & Cembalo, L. (2024). Eco-packaging in organic foods: rational decisions or emotional influences? *Organic Agriculture*, 14(2), 125-142.
- Lyu, X., Al Mamun, A., Yang, Q., & Aziz, N. A. (2024). Social entrepreneurial intention among university students in China. *Scientific Reports*, 14(1).
- M. Baumgartner and C. (2024) Influencing Factors of The Purchase Intention of Virtual, *Multivariate Behavioral Research* 58:2.
- Maehle, N., & Skjeret, F. (2022). Microalgae-based food: Purchase intentions and willingness to pay. *Future Foods*, 6.
- Mat Dawi, N., Hwang, H. J., Abdul Jalil, N., Maresova, P., & Namazi, H. (2024). Consumer Motivation to Purchase Online During COVID-19 Pandemic: Extending Protection Motivation Theory. *SAGE Open*, 14(1).
- Mensah, I. K., Khan, M. K., & Mwakapesa, D. S. (2023). Factors determining the entrepreneurial intentions among Chinese university students: the moderating impact of student internship motivation. *Humanities and Social Sciences Communications*, 10(1), 1-15.
- Mohammed, A. (2024). Factors influencing young consumers' purchasing behavior toward Saudi coffee product: An application of the extended Theory of Planned Behavior model.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2010). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *International journal of surgery*, 8(5), 336-341.
- Nekmahmud, M., Naz, F., Ramkissoon, H., & Fekete-Farkas, M. (2022). Transforming consumers' intention to purchase green products: Role of social media. *Technological Forecasting and Social Change*, 185.
- Nguyen, G. D., & Dao, T. H. T. (2024). Factors influencing continuance intention to use mobile banking: an extended expectation-confirmation model with moderating role of trust. *Humanities and Social Sciences Communications*, 11(1), 1-14.
- Nishikawa-Pacher, A. (2022). Research questions with PICO: a universal mnemonic. *Publications*, 10(3), 21.
- Nogueira, M., Dias, F., & Santos, V. (2023). Sustainable mobility choices: Exploring the impact of consumers' values, attitudes, perceived behavioural control and subjective norms on the likelihood to choose sustainable mobility options. *Journal of Consumer Behaviour*, 22(2), 511-528.

- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *bmj*, 372.
- Pai, F. Y., Shih, Y. J., Chuang, Y. C., & Yeh, T. M. (2023). Supporting Environment Sustainability: Purchasing Intentions Relating to Battery Electric Vehicles in Taiwan. *Sustainability*, 15(24).
- Patthirasinsiri, N. (2023). Exploring consumer attitudes: Organic herb cordyceps and intention to purchase. *International Journal of Data and Network Science*, 7(4), 1603-1612.
- Robichaud, Z., & Yu, H. (2022). Do young consumers care about ethical consumption? Modelling Gen Z's purchase intention towards fair trade coffee. *British Food Journal*, 124(9), 2740-2760.
- Ruan, W. J., Wong, I. A., & Lan, J. (2022). Uniting ecological belief and social conformity in green events. *Journal of Hospitality and Tourism Management*, 53, 61-69.
- Sadeli, A. H., Perdana, T., Deliana, Y., & Onggo, B. S. (2023). Consumers' purchase behavior in short food supply chains using social commerce in Indonesia. *Journal of Cleaner Production*, 386.
- Sharma, K. (2022). An analysis of consumer purchase intention for energy-efficient products. *Energy Efficiency*, 15(8), 64.
- Slaton, K., & Pookulangara, S. (2022). Collaborative consumption: An investigation into the secondary sneaker market. *International Journal of Consumer Studies*, 46(3), 763-780.
- Suk, M., Kim, M., & Kim, W. (2021). The moderating role of subjective norms and self-congruence in customer purchase intentions in the LCC market: Do not tell me I am cheap. *Research in Transportation Business & Management*, 41.
- Sun, Y., Hamedani, M. F., Javidi, G., Sheybani, E., & Hao, F. (2022). Examining COVID-19 vaccine attitude using SEM-Artificial Neural Networks approach: a case from Reddit community. *Health Promotion International*, 37(6).
- Sun, Y., Leng, K., & Xiong, H. (2022). Research on the influencing factors of consumers' green purchase behavior in the post-pandemic era. *Journal of Retailing and Consumer Services*, 69.
- Taylor, M., White, K. M., Caughey, L., Nutter, A., & Primus, A. (2023). Unique and Cheap or Damaged and Dirty? Young Women's Attitudes and Image Perceptions about Purchasing Secondhand Clothing. *Sustainability*, 15(23).
- Van Tonder, E., Fullerton, S., De Beer, L. T., & Saunders, S. G. (2023). Social and personal factors influencing green customer citizenship behaviours: The role of subjective norm, internal values and attitudes. *Journal of Retailing and Consumer Services*, 71.
- Wang, J., Xu, S., Zhang, S., Sun, C., & Wu, L. (2023). Research on the Impact of Consumer Experience Satisfaction on Green Food Repurchase Intention. *Foods*, 12(24).
- Wibowo, M. W., Putri, A. L. S., Hanafiah, A., Permana, D., & Sh Ahmad, F. (2022). How education level polarizes halal food purchase decision of Indonesian millennials. *Journal of Islamic Marketing*, 13(12), 2582-2610.
- Zhang, J., & Liu, Z. (2023). An empirical analysis of the impact of brand story themes on brand attitude in the context of B2C E-commerce platforms for organic agricultural products. *Sustainability*, 15(24).
- Zhang, Y., Cham, T. H., Pek, C. K., & Leong, C. M. (2024). Is face and information availability important in green purchasing among young consumers? *Humanities and Social Sciences Communications*, 11(1), 1-14.
- Zhao, L., Xu, Y., & Xu, X. (2023). The effects of trust and platform innovation characteristics on consumer behaviors in social commerce: A social influence perspective. *Electronic Commerce Research and Applications*, 60.
- Zhou, G., & Liu, W. (2022). Consumer choice in online vegetable distribution terminals: A Planned Behavior approach. *Journal of Retailing and Consumer Services*, 68.

THE EFFECTS OF SELECTION ATTRIBUTES OF CAFÉ ON REVISIT INTENTION: A CONCEPTUAL STUDY

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ABSTRACT

The objective of this study is to examine the effects of selection attributes of cafe on revisit intention in Malaysia. The cafe industry in Malaysia has undergone significant growth driven by factors such as urbanization, rising disposable incomes, and a growing appreciation for specialty coffee. As a result, there have been expansion and diversification, mirroring global trends in the food and beverage sector. In light of the expanding numbers of cafe and the growing desire for unique culinary experiences, customers have more choices whereby their intention to revisit the same cafe might be affected. Therefore, this paper attempts to explore the factors that influence on revisit intention among customers of cafe in Sabah, Malaysia. Some of the issues being highlighted in the literature previously associated with the cafe industry in Malaysia are related to unpleasant customer experience, pricing and value perception misalignment, lack of accessibility and convenience. Thus, this paper discusses the main problems faced by cafe in Sabah related to the factors that effect on revisit intention of customers.

INTRODUCTION

Over the past few years, Malaysia's cafe industry has undergone a remarkable transformation, evolving from a modest landscape to a vibrant and thriving sector (Omar, Ahmad, Nor, Abidin, Sulaiman & Ahmad, 2022). Initially, the cafe scene in

Malaysia faced limitations and regulations, with restrictions on operating hours and alcohol sales (Lee, 2019). However, in recent years, the industry has experienced substantial growth and diversification, fuelled by changing consumer lifestyles and preferences whereby the cafe industry has witnessed a surge in popularity, driven by factors such as urbanization, rising disposable incomes, and a growing appreciation for specialty coffee (Krisnamoorthy & Balasubramanian, 2019). The growth of cafe is reflected in the market size, which has expanded significantly, with the cafe industry contributing substantially to Malaysia's economy where the spending on cafe experiences has seen a notable increase, indicating a shift in consumer behavior towards valuing experiences and social interactions (Md Daud, Jusoh, Sulaiman, Yeop Johari & Zainal Abidin, 2020). Moreover, the emergence of new trends such as third-wave coffee culture and the fusion of traditional Malaysian flavors with international cuisines has contributed to the industry's dynamism and appeal. With a burgeoning cafe culture and increasing demand for unique culinary experiences, Malaysia's cafe industry presents lucrative opportunities for entrepreneurs and investors alike (Yahya, Mazlan & Wan Kamarudin, 2022).

Malaysia's cafe industry has experienced remarkable growth, mirroring global trends in the food and beverage sector (Omar et al., 2022). However, this growth has not been without its challenges. Despite the increasing popularity of cafe culture driven by factors such as urbanization, rising disposable incomes, and a growing appreciation for specialty coffee (Krisnamoorthy & Balasubramanian, 2019), however, the industry faces a myriad of challenges in terms of unpleasant customer experience, pricing and value perception misalignment, lack of accessibility and convenience. Unpleasant customer experience due to inconsistent product standards such as food portion have negatively impacted the overall customer

experience (Michelle, Sushila & Rupam, 2018), especially, the bad service quality across all customer interactions and unable to maintain a clean and inviting ambiance which causes unpleasant customer experience, result in negative word-of-mouth, reduced customer satisfaction and revisit intention (Rajput & Gahfoor, 2020). Moreover, some cafes struggle to strike the right balance between pricing and perceived value, leading to discrepancies between customer expectations and the actual value delivered (Suhud, Allan, Wibowo, Sabrina & Willson, 2020). Finally, accessibility and convenience challenges, such as limited parking facilities and inconvenient operating hours, further impede customer satisfaction and revisit intention, while the absence of accessibility features excludes individuals with disabilities from enjoying cafe offerings fully (Widyawati & Berlianto, 2019).

Therefore, owners and entrepreneurs in Sabah, Malaysia should pay more attention to the demand and needs of the customers and devise focused strategies to attain enhanced progress, and augment revisit intention of customers. Attempts are made to address the following question in this study: What are the factors that affect revisit intention of customers to cafes in Sabah? Therefore, this paper aims to identify the factors influencing revisit intention of customers to cafes in Sabah. This study has used Theory of Reasoned Action to address these questions in the following way, this paper was divided into four parts. The introductory section outlines and briefly discusses Theory of Reasoned Action. The next section explored the variables under study including revisit intention, product quality, service quality, price, promotion, physical environment and place. The third section introduces the conceptual framework and concludes with a summary of the paper.

LITERATURE REVIEW

Theory of Reasoned Action

The Theory of Reasoned Action places significant emphasis on analysis due to the critical role that preexisting attitudes play in the process of decision making (Ajzen & Fishbein, 1977). This theory is applied in order to know the preexisting attitudes of customers on the revisit intention towards the cafe. Theory of Reasoned Action has the core theory whereby customers act based on their intention to create a particular outcome (Hagger, 2019). Based on the concept of this theory, revisit intention towards the cafe by the customers can be predicted as the perception that has contributed to the results. In this theory of analysis, customers are rational actors who choose to act based on their best interests (Ajzen & Fishbein, 1977). This statement demonstrates that customer behavior was calculated, as logical customers will return to the cafe if the marketing mix was executed effectively, and conversely, if the marketing mix was executed poorly. Follow the concept of the theory, the specificity was important in decision making process whereby from the time the customer decides to act until the time of action was completed, the customers still have the power to change their mind and make another action (Hale, Householder & Greene, 2002). Therefore, Theory of Reasoned Action was applied as the action of the customers was followed by their intention and it could lead to different decision action.

Revisit Intention

Revisit intention refers to the likelihood or inclination of a customer to return to a particular establishment or venue for future visits or patronage (Rajput & Gahfoor, 2020). Revisit intention was a measure of the customer's intention or willingness to engage in repeat business based on their previous experiences and satisfaction with the product, service, or overall experience provided by the establishment (Bae, Slevitch & Tomas, 2018).

Product Quality

Product quality refers to the degree to which the inherent characteristics of food meet the requirements, including the appearance, quality, specification, quantity, attractive, packaging, safety and health of food (Kuan, 2017).

Product quality encompasses various aspects such as durability, reliability, performance, safety, and aesthetics (Bae et al., 2018). High product quality implies that the product consistently meets or exceeds customer requirements and performs as intended, resulting in customer satisfaction and loyalty. Conversely, poor product quality may lead to dissatisfaction, negative perceptions, and ultimately, loss of customers (Michelle et al., 2018). Effective quality management processes, including quality control and assurance measures, are essential for ensuring and maintaining product quality throughout its lifecycle, from design and manufacturing to distribution and use (Petzer & Mackay, 2014). The appearance of food definitely affect the choice of customers on their purchase behaviour (Zuratulraha, Hairunnisa, Massyittah & Gopinath, 2016).

Service Quality

Service quality is the degree to which a service fulfills or beyond customer expectations and needs which includes several aspects including responsiveness, reliability, certainty, empathy, and tangibles (Cibro & Hudrasyah, 2017).

Quality of service is the magic weapon for businesses to win in the competition, no matter in the tangible products or in the service industry (Michelle et al., 2018). The evaluation of service quality by the customers was not only considered as the result of service, but also involve the process of service whereby the better the service provided by the business, the more satisfied the customers (Suhud et al., 2020). High service quality means the

service provider regularly offers dependable, prompt, and compassionate service that meets or beyond customers expectations, resulting in customer satisfaction and revisit intention while poor service quality can lead to customers discontent, negative word-of-mouth, and lack of intention to revisit in future (Kuan, 2017).

Price

Price refers to the amount of money that a customer must pay to acquire a product or service. Price has a significance effect on the buying behaviour of customers especially when the customers compare the price with other brands (Widyawati and Berlianto, 2019).

Price is one of the most important aspects that affect the choice of customers towards products and services. Part of the consumers would even link the price of the products with the quality of the products whereby the higher the price, the better the quality (Kuan, 2017). Price reflects the perceived value of the product or service, considering factors such as production costs, competition, demand, and perceived benefits. Setting the right price is essential for businesses to achieve their revenue and profitability goals while remaining competitive in the market (Widyawati & Berlianto, 2019). One of the most frequently used strategy by the entrepreneurs is price adjustment strategies as price can directly influence the selection and satisfaction of the consumers and even their intention to revisit (Suhud et al., 2020).

Promotion

Promotion is a type of communication by marketers to consumers by informs, persuades, and reminds to influence the action taken by the consumers which promotion generally include advertising, public relations, personal sales and sales promotions (Satit, Tat, Rasli, Chin & Sukati, 2012).

Promotion is a communication activity that have a rich content in various forms of advertising, takes advantage of various opportunities to carry out corporate publicity, the follow-up service taken by the salesperson, the face-to-face promotion of products by the salesperson and all public relations activities (Bae et al., 2018). Promotion delivers good information to the target market, so as to achieve a series of activities that arouse desire of consumers to purchase products and services (Cibro & Hudrasyah, 2017). Customers will understand and trust the products and services through promotion method which enables to establish a positive image and collect the feedback and suggestions of consumers (Michelle et al., 2018).

Physical Environment

Physical environment refers to the tangible aspects of the surroundings which includes elements such as the layout, design, decor, ambiance, cleanliness, and comfort of physical spaces like retail stores, offices, restaurants, hotels, and other service establishments (Widyawati & Berlianto, 2019).

Dining environment has already become an antique class veteran for the diners, and no one wants to let business fails because of the bad dining environment. The setting of restaurant environment should take into account the target group of their business whereby every restaurant owner is familiar with the synonym of fast food is young people; high-end theme hotels are mostly for business people; health care is generally for the elderly and families (Zuratulraha et al., 2016). The internal environment of the restaurant also affects the operation of the restaurant because most of the customers are willing to have a warm and comfortable dining environment such as the cleanliness of the environment, the uniforms of service personnel are iconic and influential (Bae et al., 2018).

Place

Place is a location where businesses is been proceed and it is also known as a location that used to attract and target customers. Place is also referring as a way to deliver products and services to customers which also called as distribution whereby it is used to ensure to delivery of products or services in the right time and right place (Satit et al., 2012).

The concept of place encompasses both physical and virtual channels through which products or services are distributed, including retail stores, online platforms, wholesalers, distributors, and direct sales channels (Bae et al., 2018). A great location is needed to be convenience, helps for increase the crowd and attraction of customers, such as easy to be find and a lot of parking space (Kuan, 2017). Convenient locations is very important in cafe industry due to the reason consumers would like to have location of cafes that are closer with the place they stay (Cibro and Hudrasyah, 2017). The convenient location of cafe enables to increase the performance of the business and able to attract the customers to dine in more frequently (Widyawati & Berlianto, 2019).

CONCEPTUAL FRAMEWORK

Figure 1 shows a conceptual framework based on the Theory of Reasoned Action, offering a solid theoretical basis for comprehending customer revisit intention. Based on the Theory of Reasoned Action, product quality, service quality, price, promotion, physical environment, and place are significant factors in affecting customer revisit intention. By integrating the Theory of Reasoned Action with these variables, a robust framework can be established to investigate the factors influencing customer revisit intention and thoroughly analyze the determinants of revisit intention.

As illustrated in Figure 1, the framework enables entrepreneurs and business owners in the cafe industry to gain a deeper comprehension of the intention of customers to revisit, so serving as an efficient instrument for the development of focused measures and strategic preparations. The Theory of Reasoned Action is a psychological theory that is extensively used to anticipate human behavior. This theory has a wide variety of applications for describing people's attitudes and behaviors, especially when it comes to predicting human behavior. The findings of this research have provided useful insights, which have therefore contributed to the satisfaction of customers and their intention to return. This integrated strategy helps to have positive word-of-mouth, boost profitability and business performance, in addition to increasing business performance which is crucial to the long-term success of operating cafes in Sabah, Malaysia.

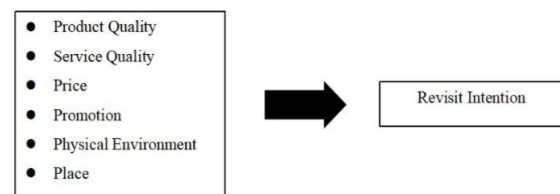


Figure 1. A conceptual framework

Table 1 displayed the sources and measurement items that were being considered. The measuring items used in this investigation were taken from those used in other studies (Amofah, Gyamfi, and Tutu, 2016; Andreti, Zhafira, Akmal, and Kumar, 2013; Jang and Namkung, 2009; Namkung and Jang, 2007; Voon, 2012). From 1, which indicates "strongly disagree," to 5, which indicates "strongly agree," a Likert scale with five points was utilized for all of the variables. The aspects that need to be taken into consideration include the revisit intention, product quality, service quality, price, promotion, physical environment and place. It is believed that these measures will react to the aims of the study, which are to investigate the effects of selection attributes of cafe on revisit intention in Sabah, Malaysia.

Table 1 Measurement items and source

No.	Measurement Item	Source
RI1 RI2 RI3	Revisit Intention: I would like to come back to the cafe in the future. I would recommend the cafe to my friends or others. I would say positive things about the cafe to others.	Namkung and Jang (2007)
PQ1 PQ2 PQ3 PQ4	Product Quality: Meal presentation is visually attractive. The cafe serves a delicious meal. The cafe offers a variety of menu items. Meal is served at the appropriate temperature.	Jang and Namkung (2009); Namkung and Jang (2007)
SQ1 SQ2 SQ3 SQ4 SQ5 SQ6 SQ7	Service Quality: Service staffs of the cafe can immediately respond to my needs and questions. Service staffs can immediately provide the service I need. The cafe responds to customers' special or extra needs. Service staffs can make efforts to assist with customers' problems. Service staffs provide the amounts on bills that are accurate. Service staffs of the cafe deliver orders to customer accurately. Service provided by the cafe can be accomplished punctually.	Andreti et al. (2013)
P1 P2 P3	Price: The cafe offers value for money in terms of quality. The cafe offers value for money in terms of quantity. The cafe offers discount.	Amofah et al. (2016)
PN1 PN2 PN3 PN4 PN5 PN6	Promotion: The cafe provides coupon to be changed with merchandise. The cafe provides seasonal promotion. For instance, Christmas, New Year, Hari Raya and etc. The cafe provides privileged card for members. The cafe provides sales promotion. The cafe provides promotional material. The cafe provides attractive promotions.	Andreti et al. (2013)
PE1 PE2 PE3 PE4 PE5 PE6 PE7	Physical Environment: The Cafe has appealing physical facilities. For instance, paintings, ceiling, wall decoration, furniture and flowers. The cafe has clean dining area. The cafe has appropriate temperature. The cafe has a nice music. The cafe has appropriate colour scheme. The cafe has a nice smell (scent). The cafe has a good design and layout.	Voon (2012)
PL1 PL2 PL3 PL4	Place: The cafe location is easily accessible. The cafe is easy to find. The cafe has a strategic location. The cafe has many branches within my residence area.	Andreti et al. (2013)

CONCLUSION

The objective of this study was to examine the effects of selection attributes of cafe on revisit intention in Sabah. Factors that affect customer revisit intention include product quality, service quality, price, promotion, physical environment and place. By investigating these variables in relation to the revisit intention of customers, this study makes a contribution to the current body of research about the topic. From a theoretical standpoint, the value of this study lies in the fact that it investigates the factors that effect on revisit intention of customers on cafe in Sabah. Through variables such as product quality, service quality, price, promotion, physical environment and place, this study extends the understanding of the factors underlying customer revisit intention.

Through the utilization on Theory of Reasoned Action as a framework, this study provides a theoretical framework for examining the relationship between these variables and customer revisit intention. Moreover, this study highlights the importance of preexisting attitudes which will directly affect the decision-making action of an individual in the context of behaviour intention on selection of cafe. The findings provide contribution to the larger body of research on the cafe industry in Malaysia by shedding light on the relationship between product quality, service quality, price, promotion, physical environment and place with customer revisit intention of cafe in Sabah, Malaysia.

The theoretical implications of this study provide specific insights for the cafe and Sabah Tea and Coffee industry. These insights help shop owners and entrepreneurs better understand the needs of customers and their revisit intention, thereby increasing customer revisit intention, positive word-of-mouth, increase profitability and business performance. The conceptual framework shown in this study contribute to validate the apply of Theory of Reasoned Action to

the behaviour action of customer. This helps to confirm whether this classic psychological theory is accurate in particular condition and industry contexts. By recognizing the importance of product quality, service quality, price, promotion, physical environment and place, it helps the owners and entrepreneurs to understand the important attributes that influence the customer to revisit a cafe.

This study contributed informative outcomes to the owners and entrepreneurs of cafe shops and help them to develop marketing strategies that help to retain different kind of customers and make improvement based on the expectation of customers in terms of product quality, service quality, price, promotion, physical environment and place. Besides, this study provided important theoretical and practical references for effects of selection attributes of cafe, which helped to improve customer revisit intention and directly increase profitability and achieve better business performance.

This study primarily examined conceptual issues and did not offer empirical evidence to support the use of Theory of Reasoned Action, product quality, service quality, pricing, promotion, physical environment, and place on consumer revisit intention. Additional study is required to confirm the relationship between these selection attributes and customer revisit intention. However, the results of this study have significant outcomes for cafe owners and entrepreneurs in Sabah, as well as offer valuable insights for future research. Future research should explore the interactions among many elements and variables to understand their impact on customers' revisit intention in coffee shops in Sabah. Utilizing quantitative approaches will provide a detailed analysis of the correlation between selection attributes and revisit intention, resulting in a more thorough comprehension of customer retention strategies and enhancement of business performance.

REFERENCES

- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888–918.
- Amofah, O., Gyamfi, I., & Tutu, C. O. (2016). The influence of service marketing mix on customer choice of repeat purchase of restaurant in Kumasi, Ghana. *European Journal of Business and Management*, 8(11).
- Andreti, J., Zhafira, N. H., Akmal, S. S., & Kumar, S. (2013). The Analysis of Product, Price, Place, Promotion and Service Quality on Customers' Buying Decision of Convenience Store: A Survey of Young Adult in Bekasi, West Java, Indonesia. *International Journal of Advances in Management and Economics*, 2(6), 72-78.
- Bae, S., Slevitch, L., & Tomas, S. (2018). The effects of restaurant attributes on satisfaction and return patronage intentions: Evidence from solo diners' experiences in the United States. *Cogent Business & Management*, 5(1), 1–16.
- Cibro, Y. E. B., & Hudrasyah, H. (2017). Factors that influence customer's intentions to revisit cafe: Case study of siete café In Bandung. *Journal of Business and management*, 6(2), 284-300.
- Hagger, M. S. (2019). The reasoned action approach and the theories of reasoned action and planned behavior. <http://dx.doi.org/10.1093/obo/9780199828340-0240>
- Hale, J. L., Householder, B. J., & Greene, K. L. (2002). The theory of reasoned action. The persuasion handbook: Developments in theory and practice, 14(2002), 259-286.
- Jang, S., & Namkung, Y. (2009). Perceived quality, emotions, and behavioral intentions: Application of an extended Mehrabian–Russell model to restaurants. *Journal of Business Research*, 62(4), 451–460.
- Krisnamoorthy, M., & Balasubramanian, K. (2019). Factors Influencing Millennials' Satisfaction of Café Restaurants in Kuala Lumpur, Malaysia. *Asia-Pacific Journal of Innovation in Hospitality & Tourism*, 8(2).
- Kuan, P. H. (2017). An empirical assessment on customers' preferences towards coffeehouse. MBA Student. Universiti Tunku Abdul Rahman.
- Lee, S. (2019). The Current Issues of Cafe Trend in Malaysia. *Culinary Science & Hospitality Research*, 25(9), 59-66.
- Md Daud, S. A. M., Jusoh, F., Sulaiman, S., Yeop Johari, H. S., & Zainal Abidin, A. (2020). Relentless expansion of a lifestyle café? *ASEAN Entrepreneurship Journal (AEJ)*, 6(SI), 32-37.
- Michelle, L. G. W., Sushila, D. R. & Rupam, K. (2018). Key Attributes of Malaysian Specialty Coffee Shops: An Exploratory Investigation. *Taylor's University, Malaysia*, 7(2), 69-83.
- Namkung, Y. & Jang, S. (2007). Does Food Quality Really Matter in Restaurants? Its Impact on Customer Satisfaction and Behavioral Intentions. *Journal of Hospitality & Tourism Research*, 31(3), 387–409.
- Omar, N. R. N., Ahmad, A. A., Nor, N. A. A. L. M., Abidin, A. Z. Z., Sulaiman, N. H., & Ahmad, B. (2022). Coffee industry in Malaysia: An overview and potential. *Economic and Technology Management Review*, 19, 103-114.
- Petzer, D., & Mackay, N. (2014). Dining atmospherics and food and service quality as predictors of customer satisfaction at sit-down restaurants. *African Journal of Hospitality, Tourism and Leisure*, 3(2).
- Rajput, A., & Gahfoor, R. Z. (2020). Satisfaction and revisit intentions at fast food restaurants. *Future Business Journal*, 6(1).
- Satit, R.P, Tat, H.H., Rasli, A., Chin, T.A., & Sukati, I. (2012). The Relationship Between Marketing Mix and Customer Decision-Making Over Travel Agents: An Empirical Study. *International Journal of Academic Research in Business and Social Sciences*.
- Suhud, U., Allan, M., Wibowo, S. F., Sabrina, E., & Willson, G. (2020). Measuring customer satisfaction of a café and coffee shop colony at a traditional market. *Journal of Foodservice Business Research*, 23(1), 78-94.
- Voon, B. H. (2012). Role of Service Environment for Restaurants: The Youth Customers' Perspective. *Procedia - Social and Behavioral Sciences*, 38, 388-395.
- Widyawati & Berlianto, M. P. (2019). The Influencing Factors on Coffee Shop Customers' Revisit Intention. *Advances in Economics, Business and Management Research*, 101, 167-173.
- Yahya, N. Y., Mazlan, N. A., & Wan Kamarudin, W. N. B. (2022). Personal factor and consumer purchase intention: the risen of coffee culture in Klang Valley, Malaysia. *Journal of Tourism, Hospitality and Culinary Arts*, 14(2), 130-148.
- Zuratulraha, J., Hairunnisa, M. I., Massyittah, O., & Gopinath, S. (2016). Restaurant quality attribute on revisit intention: The mediating effect of customer satisfaction. *Sci.Int. (Lahore)*, 30(5), 735-739.

DOES THE IMPLEMENTATION OF A MORATORIUM BRING POSITIVE SHOCK TO THE BANK STOCK PRICE AMIDST THE GLOBAL PANDEMIC?

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ABSTRACT

Malaysia was the only nation that provided moratorium on loan repayment in a blanket basis during the global pandemic. Thus, this study examines the whether moratorium has a contractionary or an expansionary impact from the perspective of loan repayment towards the volatility of banking stock prices listed in Bursa Malaysia. The Exponential GARCH (EGARCH) was employed with daily data from 2 January 2019 to 31 December 2021. The empirical findings showed that the loan-repayment moratorium induced a positive shock to the volatility of Hong Leong Bank, Public Bank, RHB Bank, and Alliance Bank. However, all these banks exhibit a leverage effect, and negative shocks were more pronounced towards their stock price volatility during the moratorium implementation. The findings were crucial for investors and authorities to understand the impact of a moratorium on the banks towards the stock price.

INTRODUCTION

The banking industry has experienced numerous challenges during the global pandemic caused by the coronavirus disease 2019 (COVID-19). The unforeseen impact of this global pandemic has caused significant damage to the global economy and financial markets (Ciotti *et al.*, 2020), especially when there was no medical solution to protect against it during the initial outbreak. As

the virus propagated globally, the world population has incurred a significant toll in terms of human lives lost during this pandemic. It forces governments worldwide to take drastic measures by implementing emergency ordinances and restricting people's movement to curb the spread of the virus. In Malaysia, the Movement Control Order (MCO) was enforced on 18 March 2020, restricting households from leaving their homes except for essential purposes.

Since economic activities were almost at a standstill, Malaysia's central bank (Bank Negara Malaysia, B.N.M.) perceived this event as a catastrophe. B.N.M. projected that households and businesses would struggle to service their loan repayment which could create an adverse effect for the banks. Navigating the uncharted territory, B.N.M. initiated implementing a six-month automatic full blanket loan-repayment moratorium to assist households and businesses. It also served as a precaution to preserve the banks' ability to sustain operations by mitigating the rise in non-performing loans and bankruptcy.

B.N.M. requested banks to offer an automatic six-month full blanket moratorium on loan repayment (except credit card) to debtors. In other words, all borrowers were granted the temporary option to postpone the repayment obligation of their current loans without being subject to any conditions. This made Malaysia unique compared to other countries (e.g. Australia, New Zealand, India, Pakistan, Bangladesh, and Brunei), where borrowers must meet specific criteria to qualify for this financial repayment relief (Sah and Wong, 2021; Rosli et al., 2023).

The moratorium loan repayment was an intervention by the central bank to mitigate the income loss suffered by households and businesses during the pandemic (Shah et al., 2020). With the moratorium, cash meant for loan-repayment could be rechanneled for other spendings, which supports the economy during an unprecedented crisis. Notably, the moratorium in Malaysia covered not just the banks but also licensed credit houses and corporations. B.N.M.'s primary goal was to expand the accessibility of short-term financial assistance to individuals and businesses experiencing adverse circumstances caused by the crisis.

Table 1: Bank Stock Price

Banks/Stock price	Index Listed	Moratorium Starts 1 April 2020 (M.Y.R.)	Moratorium Ends 30 September 2020 (M.Y.R.)	Changes (%)
AMMB Holdings Berhad	KLCI and Finance	2.94	3.00	+0.02%
CIMB Group Holdings Berhad	KLCI and Finance	3.53	3.08	-0.13%
Hong Leong Bank Berhad	KLCI and Finance	13.22	15.04	+0.14%
Malayan Banking Berhad	KLCI and Finance	7.33	7.22	-0.02%
Public Bank Berhad	KLCI and Finance	3.14	3.14	-
RHB Bank Berhad	KLCI and Finance	4.55	4.57	+0.004%
Alliance Bank Malaysia Berhad	Finance	1.44	1.40	-0.02%
Affin Bank Berhad	Finance	1.86	2.19	+0.18%
Bank Islam Berhad	Finance	2.43	2.62	+0.08%
Malaysia Building Society Berhad	Finance	0.56	0.51	-0.09%

Source: Bloomberg Terminal as of 31 December 2023

Due to the consequences of the global pandemic and the moratorium implementation, banks were anticipated to face challenging times due to lower incomes. Surprisingly, however, Table 1 shows that the banks stock prices in Malaysia experienced an increase at the end of the moratorium. Four banks experienced slightly lower stock prices: CIMB Group Holdings Berhad, Malayan Banking Berhad, Alliance Bank Malaysia Berhad, and Malaysia Building Society Berhad. Thus, the question arises as to whether implementing an automatic full blanket loan-repayment moratorium positively impacts the bank's stock price. While most of the bank's stock prices worldwide plummeted (Ellul *et al.*, 2020; Acharya *et al.*, 2021), Malaysia's bank stock prices seemed to go in a different direction. Although the moratorium relieves most households and businesses, there was a question about its impact on bank stock prices, prompting questions about whether it brings a positive shock which eventually made Malaysia bank's stock price volatile.

Addressing this issue was crucial to current and prospective investors since an incline in bank stock price lead to a decline in the bank's debt-to-equity ratio. Consequently, investors who bore the cost of the additional risks regard the future cash flow of the bank as comparatively riskier (Brooks and Williams, 2022). Thus, there was a need to emphasize the risk since investors consider risk measurement while making investment decisions. Even though volatility in stock prices or any financial assets has been a natural phenomenon due to positive or negative information at the domestic or international level (Setiawan *et al.*, 2021), market volatility is an illustration of investors' lack of confidence, and it reflects the risks that investors experience.

Furthermore, increased volatility generated a fear of losses among investors. Such uncertainty can prompt investors to divest their funds by selling their stock holdings, leading to a further decline in

stock prices (Adenomom *et al.*, 2022). It was also crucial for authorities to gain a deeper understanding of the impact of a moratorium on the bank's stock price since changes in monetary policies can send positive and negative shocks to the stock market (Hu *et al.*, 2018; Liu *et al.*, 2022). By comprehending the potential positive or negative consequences of implementing a moratorium, B.N.M. can proactively prepare and strategize for future uncertainties or crises. The empirical results of this study could contribute new insights and discussions to the existing body of knowledge. This was because many studies have primarily examined the effects of the global pandemic on stock indices. At the same time, only Malaysia uniquely implemented a full 6-month blanket moratorium on loan repayment during this period.

RESEARCH OBJECTIVE

The specific objective of this study was to examine the asymmetric effect and shocks of the moratorium on the volatility of individual stock prices of publicly listed banks in Bursa Malaysia during the unprecedented event of the COVID-19 global pandemic.

LITERATURE REVIEW

Numerous studies focused on the stock market's volatility and asymmetric effect. However, there have been few studies on moratoriums since only Malaysia implemented a full blanket moratorium during the global pandemic. Sah and Wong (2021) were did the sole research that specifically examined the effects of a moratorium on the Malaysian banking sector. They investigated the impact of this financial relief on the banking sector by employing cumulative abnormal returns. They found that a full blanket moratorium has led to a drop in the cumulative abnormal return for three major local banks: Malayan Banking Berhad, CIMB Groups Holdings Berhad, and Public Bank Berhad. Hence, this study concluded that banks' stock price was

negatively affected by the implementation of the moratorium.

Putri (2020) examined the stock price differences in the top ten stocks of Indonesian banking companies prior to, during, and after the global pandemic. A paired Sample T-test was employed, and it was found that the stock price in Indonesia's banking sector fell sharply during the global pandemic, and there was a significant difference in stock prices before and after the pandemic. Meanwhile, Bhuvaneshwari and Radhika (2021) employed Granger causality and impulse response function to examine COVID-19's impact on Nifty Bank, Financial Services, Private Banks, and P.S.U. Banks. This study demonstrated a short-term causal relationship between the Nifty 50 and several sectoral indices. Furthermore, this study also found that a change in the Nifty 50 index pre-COVID-19 and during COVID-19 significantly affected the index values of Nifty Bank and Nifty Private Banks.

It cannot be denied that a limited number of studies concentrated on the impact of loan-repayment moratorium, but several studies examined the relationship of bank loans on the stock market. This was relatable since a full blanket moratorium is a form of financial relief from the bank loan. For example, the relationship between bank loans and stock prices was investigated by Ibrahim (2004) using a generalized impulse response function and a value at risk (V.A.R.) model. It found that bank loans positively impacted stock prices, but this effect was insignificant. The study concluded that bank loans do not substantially transfer the effects to the stock market. Ibrahim and Shah (2012) examined the interrelations between bank lending, the stock market, and financial uncertainty in an emerging economy, finding evidence that market volatility tends to depress bank loans. Apart from its adverse effect on bank loans, heightened market uncertainty depressed stock prices. Thus, market volatility impacts both bank loans and stock prices.

Similarly, Samsi *et al.* (2018) explored the impact of the global financial crisis on both the stock market and bank loans. Their findings indicated that the crisis significantly affected both the stock market and bank loans. Three of the five ASEAN nations studies demonstrated that the global financial crisis had a more pronounced impact on banks. In addition, this study also suggested that the global financial downturn set the stage for the subsequent credit crisis, leading to higher risk premiums being imposed on bank loans.

Far from Malaysia, Almutair (2015) examined the relationship between bank loans and Saudi Arabia's stock market index (SSPI). The researcher found a direct relationship between SSPI and bank loans, which aligns with the economic theory that asserts when stock prices rise, demand and supply for bank loans subsequently increases. In addition to examining the relationship between banks and stocks, it is essential to view the circumstances from the perspective of risks, given that the uncertainty in the market may have contributed to a drop in the stock price due to the rise in investment risk.

While there was currently no specific research on the effects of a moratorium on bank stock price volatility, a substantial amount of research has been undertaken to investigate the impact of COVID-19 on the volatility of bank stock prices or indexes. Bhatia and Gupta (2020) examined the volatility of specific banking sector indices in India compared to the general banking index during the first wave of the COVID-19 pandemic. The selection process consisted of selecting Nifty Bank, Public Sector Undertaking Bank, and Private Sector Bank, and the EGARCH model was employed. The results revealed that only leverage has a significant impact on PSUBI. Furthermore, the study found that a significant leverage effect which indicated negative news regarding COVID-19 had a more significant impact than any positive news during the study period.

Ahadiat and Kesumah (2021) utilized the GARCH model and value at risk to analyze the possible investment losses associated with investing in an Indonesian state-owned bank. The empirical findings of this study revealed that all banks exhibit a negative sign, suggesting the most potential loss investors may experience by holding their stocks during the COVID-19 pandemic. This study further discovered that the leverage effects were more pronounced than the asymmetry effect and recommends that investors reevaluate their investment in an Indonesian state-owned bank. This study aligns with the results obtained by Batten *et al.* (2022), which examined the transmission of volatility between European Global Systemically Important Banks and the persistence of volatility in the stock market. Batten *et al.* (2022) demonstrated the leverage effect of V.I.X. and the negative impact on the European Global Systemically Bank's performance amid the COVID-19 pandemic.

Nikhil *et al.* (2023) sought to examine the volatility of the returns of the Indian Bank Nifty by employing a range of GARCH models. Using the Nifty Bank Index as data from June 2005 to May 2022, it discovered that positive shocks had a more significant impact on the volatility of Bank Nifty returns than adverse shocks. This study added that positive shocks in the Indian banking industry led to an increase in volatility in the following period, compared to negative shocks of the same size. This phenomenon was referred to as the anti-leverage effect. Therefore, the leverage coefficient's outcome confirmed that the disturbance in volatility caused by positive shocks was greater than that caused by negative shocks. However, the impact was not continuous across the Indian Banking series.

Close to Malaysia, Setiawan *et al.* (2021) examined the influence of COVID-19 on Indonesia's stock indexes using the GARCH model. Their findings indicate that the Indonesia stock index was affected by COVID-19, leading to significant disruptions

in Indonesian financial markets. Similarly, Nurdany *et al.* (2021) examined the impact of asymmetry on the Indonesia Sharia Stock Index (ISSI) and discovered a noteworthy and statistically significant asymmetric effect on the ISSI. They added that positive shocks significantly influenced volatility more than negative shocks. Furthermore, both Setiawan *et al.* (2021) and Nurdany *et al.* (2021) recommend that the government persist in curbing the virus's spread and implementing its economic recovery strategy.

Alzyadat *et al.* (2021) and Eledum and Sayed (2021) examined the persistence of volatility and asymmetrical effects on the stock market in Saudi Arabia. Alzyadat *et al.* (2021) utilized a non-linear GARCH model to analyze the performance of the Saudi Arabia single stock index during the COVID-19 pandemic. The findings indicated an inverse asymmetrical effect before the COVID-19 pandemic, and a significant negative impact was observed after the health crisis occurred. Eledum and Sayed (2021) conducted a study by selecting 21 industrial sectors listed in the Saudi stock market instead of focusing on a single stock index. The EGARCH model was utilized, and empirical results showed a leverage effect. Specifically, negative shocks accounted for 25% of the observed changes, while positive shocks accounted for 14%. This study also specifically concluded that there is a leverage effect in the banking sector, which implies that a negative shock has a greater impact on volatility than a positive shock of the same magnitude.

On the other hand, Fakhfekh *et al.* (2021) used the ARCH family model to study Tunisian sectoral stock market indices' volatility persistence and asymmetric effect during COVID-19. They found that Tunisian listed banks had a strong positive and significant asymmetric effect during COVID-19. Close to Tunisia, Bonga *et al.* (2022) examined Zimbabwean stock market volatility between January 2020 and January 2022. This study

employed GARCH family models to quantify volatility analysis on all Zimbabwe Stock Exchange stock indices. The asymmetry coefficient of EGARCH (1,1) was positive and statistically significant, indicating that positive and negative shocks of the same magnitude affect the stock market differently. In particular, positive volatility shocks were more pronounced than negative shocks in the Zimbabwe stock market.

In the United States, Ozdemir *et al.* (2021) investigated the impact of COVID-19 on stock indices in the US, Germany, France, and the U.K. by employing the EGARCH model. This research's empirical findings revealed a significant increase in volatility in the major stock markets during the first wave of COVID-19. This volatility was characterized by short persistence and was influenced by leverage in returns. Furthermore, it has been discovered that positive shocks during the pandemic have a more significant impact on the volatility of stock index returns compared to negative shocks. Subsequently, Khan *et al.* (2023) examined the asymmetric effects of COVID-19 on cryptocurrency, commodities, and S&P500 by employing the EGARCH model, and this study discovered that the S&P500 exhibited a notable asymmetry effect during the COVID-19 pandemic.

Prior research conducted in Malaysia has primarily focused on the relationship between bank loans and stock prices but relied on stock indices rather than the specific prices of individual bank stocks price. The essence of this distinction lies in the fact that the Kuala Lumpur Composite Index encompasses numerous sectors, with banks being only one component among them, and it would be beneficial to narrow down the individual prices of individual bank stocks. Thus, this study took

a similar route to Bhatia and Gupta (2020), Sah and Wong (2021), Ahadiat and Kesumah (2021), Batten *et al.* (2022), and Nikhil *et al.* (2023), which employed individual bank stock prices. This study further expanded the scope of previous studies by adding moratorium as the subject of interest and examining its impact on the volatility of individual Malaysian bank stock prices. The empirical findings of this study could contribute new insights and discussions to the existing body of knowledge, especially when Malaysia is the only country granted an automatic six-month full blanket moratorium during the COVID-19 global pandemic.

METHODOLOGY

The data used in this study focused on the individual stock prices of publicly listed banks in Bursa Malaysia, consisting of daily closing prices spanning from 2 January 2019 until 31 December 2021. These data were retrieved from Bloomberg Terminal, represented in natural logarithms, and converted to a return model by using the formula where r_t is the return of individual stocks, P_t is the price of individual stocks on day t and P_{t-1} respectively. Individual banks' stock prices listed on Bursa Malaysia are presented in Table 2. Kuala Lumpur Composite Index (KLCI) was included in the study as a benchmark for the study, although six banks were part of the KLCI. Moreover, the overnight policy rate (O.P.R.) was also a controlled variable since interest rate changes potentially impact every bank's stock price. Noted that B.N.M. offers several loan repayment relief offers, but the automatic full blanket moratorium was only given for six months. Thus, this study included moratorium (M_t) as dummy variables with the value 1 from 1 April 2020 until 30 September 2020, while the rest takes 0.

Table 2: List of Variables

Name of Bank	Variable in return
Kuala Lumpur Composite Index	RKLCI
AMMB Holdings Berhad	RAMBANK
CIMB Group Holdings Berhad	RCIMB
Hong Leong Bank Berhad	RHLB
Malayan Banking Berhad	RMAYBANK
Public Bank Berhad	RPBB
RHB Bank Berhad	RRHB
Alliance Bank Malaysia Berhad	RALLIANCE
Affin Bank Berhad	RAFFIN
Bank Islam Berhad	RBIMB
Malaysia Building Society Berhad	RMBSB

Source: Bloomberg Terminal as of 31 December 2023

Engle (1982) developed the Autoregressive Conditional Heteroskedasticity (ARCH) model to understand better the dynamic properties of financial time series and forecast variations in heteroskedasticity over time. This model was extended by Bollerslev (1986) by allowing the conditional variance to be dependent upon previous own lags, known as the Generalized ARCH (GARCH) model. Since its development, the

GARCH model has seen numerous proposed expansions and modifications. However, the fundamental constraint of the GARCH model is the requirement for a symmetrical response of volatility to both positive and negative shocks. This occurs since the conditional variance depends on the magnitudes of the lagged residuals rather than their signs. There is a contention that negative shocks in financial time series are more likely to result in a significant rise in volatility than positive shocks of the same magnitude (Black, 1976). Thus, Nelson (1991) proposed the Exponential GARCH (EGARCH) model, which allows the modelling of positive (asymmetric) or negative (leverage) effects. Furthermore, this model can capture the asymmetric nature or skewness caused by the inverse correlation between volatility and returns, and its parameters are guaranteed to be positive since it is working with the log of the variance, and this solving process is more straightforward and more flexible (Lahmiri, 2017). The specification conditional variance (of EGARCH(1,1) model as follows:

$$h_i = a_i + \varphi_i \left(\left| \frac{e_{t-1}^2}{h_{t-1}} \right| \right) + \gamma_i \frac{e_{t-1}^2}{h_{t-1}} + \beta_i h_i \quad (1.1)$$

where a_i is a constant, φ_i is an ARCH term, and β_i is a GARCH term. Volatility persistence in Equation (1.1) governs by $\varphi_i + \beta_i$, compared to GARCH where volatility persistence measured by the sum of coefficient $\varphi_i + \beta_i$ and γ_i (Oseni and Nwosa, 2011). Meanwhile γ_i is the coefficient that captures the asymmetric effects in volatility and the null hypothesis is the model is symmetry ($\gamma_i = 0$) and alternative hypothesis is ($\gamma_i \neq 0$). Specifically, alternative hypothesis of $\gamma_i > 0$ and $\gamma_i < 0$ which implies asymmetric effect and leverage effect respectively. Furthermore, the positive shocks ($\gamma_i > 0$) can be seen if the sum of coefficient is greater than the negative shocks ($\gamma_i < 0$), or positive shocks have a stronger impact on conditional volatility than past positive shocks (Lin, 2017). O.P.R. added in the model as controlled variable while moratorium as dummy variable and the specification EGARCH(1,1) model as follows:

$$h_i = a_i + \varphi_i \left(\left| \frac{e_{t-1}^2}{h_{t-1}} \right| \right) + \gamma_i \frac{e_{t-1}^2}{h_{t-1}} + \beta_i h_i + \delta_{1,i} OPR + \delta_{2,i} Moratorium \quad (1.2)$$

$\delta_{2,i}$ introduced as dummy variable in Equation (1.2) in line with the objective of this study in investigating the impact of the moratorium implemented during the global pandemic and $\delta_{2,i}$ is the coefficient to be determine for moratorium. The optimal EGARCH(1,1) models for each bank's returns were selected based on the lowest values of the Akaike Information Criterion, Schwarz Information Criterion, and Hannan-Quinn Criterion. Subsequently, this study performed diagnostic tests on EGARCH models and assessed the significance of the model parameters that satisfied the specified criteria. Following that, this study addresses the objective of this study by utilizing the EGARCH(1,1) model to

examine the shocks in volatility of the bank's stock price. Selection on the error distribution is based on the kurtosis from the descriptive statistics. This study will utilize Gaussian normal distribution if the model is leptokurtic and student's distribution if leptokurtic (Dana, 2016; Ozdemir et al., 2021). Moreover, Half-Life () measure based on Engle and Patton (2001) used in this study in order to estimate on the number of days of volatility persists and it can be estimated by . Autoregressive Conditional Heteroscedasticity Lagrange Multiplier (ARCH-LM) and correlogram statistic or Q-Statistics based on Ljung-Box were also conducted to examine the presence of heteroscedasticity and model's residual.

FINDINGS

This section is organized into three distinct subsections. The first subsection presents an overview of the descriptive data for all the banks, consisting of 737 observations. All variables were transformed into their respective return forms and natural logarithms to get a more accurate approximation of a normal distribution, and the results are provided in Table 3. The second subsection presents the outcomes of the EGARCH model without a dummy variable, while the third subsection presents the primary findings, including a moratorium.

Table 3: Descriptive statistics

Banks	Mean	SD	Skewness	Kurtosis	JB
RKLCI					
RAMBANK	-0.000417	0.016941	-0.781331	12.539740	2869.647***
RCIMB	-0.000049	0.017755	-0.317565	24.216750	13835.76***
RHLB	-0.000117	0.013523	0.753899	25.160550	15150.36***
RMAYBANK	-0.000167	0.011416	-1.202899	30.141860	22799.97***
RPBB	-0.000231	0.016235	2.373783	30.774380	24381.06***
RRHB	0.000013	0.015378	1.189809	29.888870	22376.36***
RALLIANCE	-0.000482	0.017182	-1.245054	22.287440	11614.08***
RAFFIN	-0.000326	0.012832	0.459782	11.838650	2424.955***
RBIMB	0.000192	0.016148	-0.566537	17.018580	6074.244***
RMBSB	-0.000728	0.019812	-0.271472	18.160220	7066.822***

Notes: Total observation is 737. S.D. is standard deviation and J.B. is Jarque-Bera test statistic. All variables are expressed in return form and natural logarithm. *** denotes 1 percent level of significance.

For the first moment, only two banks recorded a positive mean: RBIMB (0.000192) and RRHB (0.000013). Other banks recorded a negative mean, with RMBSB being the lowest (-0.000728). For the second moment, RMBSB recorded the highest standard deviation value (0.019812) and the lowest value recorded by RMAYBANK (0.011416). On the third moment, RHLBANK, RPUBLIC, RRHB, and RAFFIN recorded a positive skewness value, indicating a longer-tailed on the right side. Meanwhile, RAMBANK, RCIMB, RMAYBANK, RALLIANCE, RBIMB, and RMBSB exhibit an asymmetric distribution as it recorded negative skewness

values. For the fourth moment, the kurtosis value for all variables is greater than 3, indicated a heavy-tailed or leptokurtic distribution. Lastly, Jarque-Bera test statistic recorded 1 percent level of significant which implies that the distribution of all variables departed from normality. This non-normality also indicated the presence of GARCH effect in all series. Moreover, the presence of volatility clustering can be seen in the Figure 1. Consequently, the aforementioned descriptive statistics result on the skewness justified using the EGARCH model. Moreover, based on the excess of kurtosis, non-normality of Jarque-Bera test

statistic, and clusters of volatility shown in Figure 1, the student's conditional distribution for errors was applied in the EGARCH model and the estimation was carefully executed to achieve convergence.

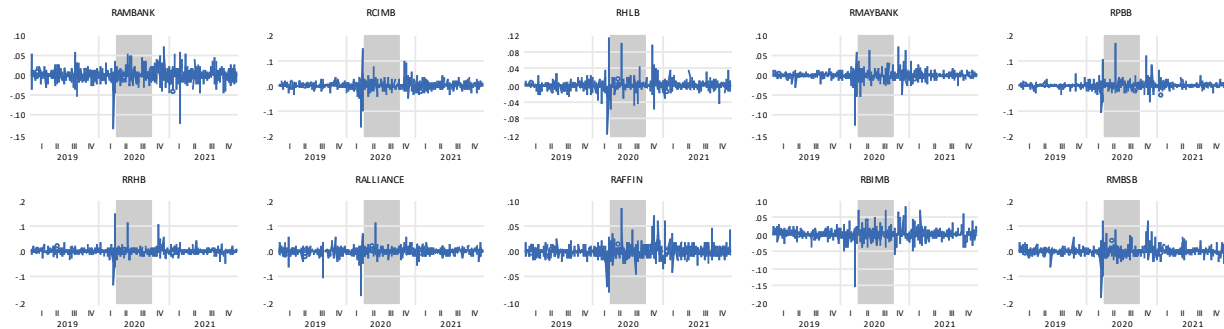


Figure 1: Bank's Daily Return and Implementation of Moratorium

The shaded area represents the duration through which the automatic full blanket moratorium was implemented, spanning from 1 April 2020 to 30th April 2020.

Table 4: Result of Unit Root Test and ARCH Effect

Banks/Tests	ADF	PP	ARCH-LM (1)	(12)	(12)
RKLCI					
RAMBANK	-30.7044***	-30.6352***	1.280763	10.484	8.0305
RCIMB	-10.8156***	-29.6076***	30.97521***	42.338***	225.01***
RHLBANK	-12.6086***	-26.1916***	0.636655	19.676**	89.089***
RMAYBANK	-11.4764***	-29.7106***	1.239458	29.273***	41.543***
RPUBLIC	-12.2946***	-25.7347***	0.256972	30.004***	42.356***
RRHB	-12.669***	-30.4682***	13.99373***	35.786***	136.77***
RALLIANCE	-11.183***	-27.6307***	5.585090**	18.999*	41.239***
RAFFIN	-17.3172***	-26.9395***	4.881093**	16.025	58.454***
RBIMB	-18.0239***	-27.1053***	0.0336**	16.471	18.816*
RMBSB	-10.9424***	-28.6138***	22.19880***	38.631***	182.73***

Notes: A.D.F. is Augmented Dickey Fuller and P.P. is Phillip Perron. ARCH-LM is Autoregressive Conditional Heteroscedasticity Lagrange-Multiplier. is Correlogram Q-statistic represents Ljung-Box for normalized residuals and is Ljung-Box for squared residuals. () represent number of lags. *** and ** denotes 1% and 5% level of significance respectively. All variables are expressed in return form and natural logarithm.

Augmented Dickey Fuller (A.D.F.) developed by Dickey and Fuller (1979) and Phillips Perron (P.P.) developed by Phillips and Perron (1988) were employed in this study for stationarity analysis. Result showed that all models were stationary at level, indicating that the model did not have unit root. This study proceeded to determine the heteroscedasticity (ARCH-LM) and autocorrelation (Ljung-Box). Result showed that all models exhibited an ARCH effect and/or correlation except for RAMBANK. Thus, RAMBANK was excluded from further investigation. Overall, pre-condition of descriptive statistic, unit root, and ARCH effect of using EGARCH models have been satisfied (Ahmed et. al., 2018).

Table 5: Result of EGARCH(1,1) model without Moratorium

$h_i = a_i + \varphi_i \left(\frac{e_{t-1}^2}{h_{t-1}} \right) + \gamma_i \frac{e_{t-1}^2}{h_{t-1}} + \beta_i h_i$						
Variable	φ_i	γ_i	β_i	$e_{t-1}^2 > 0$ $\varphi_i + \gamma_i$	$e_{t-1}^2 < 0$ $\varphi_i - \gamma_i$	HL
RKCLI						
RCIMB	0.29341***	-0.00981	0.95021***	-	-	13.57
RHLB	0.06450***	-0.02597***	0.98798***	0.03853	0.09047	57.31
RMAYBANK	0.21031***	0.01084	0.99161***	-	-	82.27
RPBB	0.10145***	-0.08016***	0.9946***	0.02129	0.18161	127.94
RRHB	0.18264***	-0.06933***	0.98916***	0.11331	0.25197	63.55
RALLIANCE	0.30664***	-0.04314**	0.93248***	0.2635	0.34978	9.9
RAFFIN	0.33122***	0.02883**	0.92561***	-	-	8.97
RBIMB	0.29271***	0.00736	0.73097***	-	-	2.21
RMBSB	0.34906***	0.02528***	0.93452***	-	-	10.23

Notes: is half-life. *** and ** denotes 1% and 5% level of significance. All variables are expressed in return form and natural logarithm.

This study employed the EGARCH model to validated the volatility for all samples further and investigated the impact of moratorium on the bank's stock price. Output result of conditional variance of EGARCH presented in Table 5. On the return volatility, all models characterized by a very high persistence since the coefficient of β_i is closed to 1, except RBIMB (. Thus, almost all stock price of bank's returns was characterized by a long memory effect during the global pandemic of COVID-19. The Result also shows that all variables' coefficients were statistically significant, except for RCIMB, RMAYBANK, and RBIMB. On the asymmetric effect, conditional volatility model of RAFFIN, and RMBSB experienced an asymmetric effect (γ_i) while RHLB, RPBB, RRHB, and RALLIANCE exhibit a leverage effect (φ_i). Thus, the presence of leverage effect from these banks were corroborated with PSUBI in India (Bhatia and Gupta, 2020), Indonesia state-owned bank (Ahadiat and Kesumah, 2021), Global Systemically Important Banks (Batten *et al.*, 2022), and banking sector in Saudi Arabia (Eledum and Sayed, 2021).

In the EGARCH model, the impact of positive shock on the volatility was calculated by while negative shock is calculated by (γ_i Lin, 2017; Ozdemir *et al.*, 2021). Results show that positive shocks affect RHLB by 0.0385% and negative shocks by 0.09%. Volatility persistence was examined, and the effect continue for approximately 57.31 days. On the other hand, RPBB was affected more by negative shocks (0.1816%) than positive shocks (0.02129%). In addition, RPBB recorded the highest volatility effect compared to others, as it continued for approximately 127.94 days. Meanwhile negative shocks of RRHB (0.252%) were more pronounced than positive shocks (0.1133%). The effect of volatility was approximately 63.55 days. Similar with other banks, positive shocks of RALLIANCE was affected as much as 0.2635% while negative shocks affected as much as 0.35%. However, RALLIANCE recorded the lowest impact of volatility by 9.9 days, and it suggested that the impact of volatility shocks was short-lived and quickly dissipated compared to RHLB, RPBB, and RRHB. Hence, these negative shocks experience by these banks during the COVID-19 global pandemic align with the empirical result by Ozdemir *et al.*, (2021).

Table 6: Result of EGARCH(1,1) model with moratorium

$h_i = \alpha_i + \varphi_i \left(\left \frac{e_{t-1}^2}{h_{t-1}} \right \right) + \gamma_i \frac{e_{t-1}^2}{h_{t-1}} + \beta_i h_i + \delta_i \text{Moratorium}$							
Variable	φ_i	γ_i	β_i	δ_i	$\frac{e_{t-1}^2 > 0}{\varphi_i + \gamma_i}$	$\frac{e_{t-1}^2 < 0}{\varphi_i - \gamma_i}$	HL
RKLCI							
RCIMB	0.29299***	-0.00996	0.95079***	-0.00392			13.74
RHLB	0.05973***	-0.03683***	0.98595***	0.02075***	0.0229	0.09656	48.97
RMAYBANK	0.21099***	0.01146	0.99114***	0.7965			77.86
RPBB	0.10373***	-0.07425***	0.99133***	0.01516***	0.02948	0.17798	79.64
RRHB	0.23974***	-0.06255***	0.96582***	0.03644***	0.17719	0.30229	19.93
RALLIANCE	0.33180***	-0.05590***	0.9211***	0.06007***	0.2759	0.3877	8.43
RAFFIN	0.35578***	0.01358	0.89925***	0.08416***			6.53
RBIMB	0.29972***	0.00078	0.74434***	0.10065***			2.3
RMBSB	0.35411***	0.02762*	0.92779***	0.03015			9.24

Notes: is half-life. *** and ** denotes 1% and 5% level of significance. All variables are expressed in return form and natural logarithm.

Moratorium introduced in the EGARCH model as the dummy variable in line with the objective of this study and the impact of moratorium presented in Table 5. All banks recorded a positive and statistically significant coefficient for except for RCIMB, RMAYBANK, and RMBSB. This indicated that implementation of moratorium did not affect the volatility in CIMB Group Holdings Berhad, Malayan Banking Berhad, and Malaysia Buliding Society Berhad. RAFFIN and RBIMB also exhibited a statistically significant coefficient of but failed to reject null hypothesis (. Thus, moratorium did affect the volatility of RAFFIN and RBIMB but no asymmetric nor leverage effect was found in the volatility.

Similar with the result in Table 5, among all the banks, only RHLB, RPBB, RRHB, and RALLIANCE exhibited a statistically significant coefficients at 1 percent level in the models. Furthermore, these models exhibited a positive and statistically significant . This indicated that moratorium induced a positive volatility to RHLB, RPBB, RRHB, and RALLIANCE by 0.0208%, 0.0152%, 0.1772%, and 0.2759% respectively. But coefficient of in the model was negative, which indicated that all banks exhibit a leverage effect (, with and without the moratorium.

A negative sign coefficient of indicated that there was a leverage effect in the model. Meanwhile positive and statistically significant indicated that moratorium induced a positive volatility to RHLB, RPBB, RRHB, and RALLIANCE. Similarly, the negative shock to the volatility of RHLB, RPBB, RRHB, and RALLIANCE was more pronounce than positive shocks. Moreover, there was an increase in negative shocks when the moratorium was included in the model where RRHB recorded the highest increase of 0.00503%, followed by RALLIANCE (+0.0038%), and lastly RHLB (+0.0058%). Only RPBB recorded a reduction of negative shock when moratorium included in the model by 0.0036%. Empirical result of this study was in line with the conclusion made by Sah and Wong (2021) as the implementation of moratorium caused a negative shock towards volatility of the bank stock price. On the other hand, this study also found that moratorium in the model shorter all volatility decay of all the banks based on Half-Life, except for RCIMB (+0.17 day). Thus, implementing the moratorium did cause negative shocks to the banks, but it shortened the duration of the volatility.

Diagnostic tests were re-conducted to examine the appearance of heteroscedasticity and autocorrelation problem. The accuracy of the model specification was indicated by the

statistically insignificant ARCH-LM (1). This result indicated that the ARCH effect in the return model disappeared. Furthermore, the value of Q-stat and Q²-stat for the lag of 12 was statistically insignificant, indicating that the model was unaffected by autocorrelation (except RCIMB and RMBSB).

Table 7: Diagnostic tests

Model	WITHOUT MORATORIUM			WITH MORATORIUM		
Variable/Test	ARCH-LM (1)	(12)	(12)	ARCH-LM (1)	(12)	(12)
RKLCI						
RCIMB	0.075646	13.696	19.282**	0.144736	14.513	21.464**
RHLB	0.236809	6.1497	1.2946	0.17275	6.0976	1.0613
RMBB	0.143514	11.311	3.6414	0.158987	11.843	3.7126
RPBB	0.259423	8.5366	3.2283	0.384794	8.6011	4.0588
RRHB	0.138276	8.5741	2.6205	0.168522	8.754	3.4199
RALLIANCE	0.07156	12.694	3.122	0.071136	12.681	3.1002
RAFFIN	0.160543	15.556	10.315	0.265389	15.757	9.839
RBIMB	0.316335	13.78	9.0004	0.244058	14.822	10.247
RMBSB	0.209411	15.938	25.459**	0.271426	13.733	23.999**

Notes: ARCH-LM is Autoregressive Conditional Heteroscedasticity Lagrange-Multiplier. is Correlogram Q-statistic represents Ljung-Box for normalized residuals and is Ljung-Box for squared residuals. () represent number of lags. ** denotes 5% level of significance. All variables are expressed in return form and natural logarithm.

CONCLUSION

This study examines the impact of the loan repayment moratorium on the volatility of banking stocks in Bursa Malaysia. Empirical result showed that automatic six-months full blanket moratorium did induce a positive shock to the volatility of the stock price of all public listed banks except for CIMB Group Holdings Berhad, Malayan Banking Berhad, and Malaysia Building Society Berhad. However, Hong Leong Bank Berhad, Public Bank Berhad, RHB Bank Berhad, and Alliance Bank Berhad experience a leverage effect and on top of that, a negative shock was more pronounce compared to the positive shock to the volatility of their stock prices. Thus, it can be concluded that the magnitude of the moratorium's positive shock was rather smaller compared to the negative shock experience by the stock price of these banks. Overall, the implementation of a moratorium has a negative impact on the volatility of the bank's stock price. However, it does shorten the duration of the volatility.

Findings from this study might be advantageous to current and prospective investors. Banks such as Malayan Banking Berhad, Affin Bank Berhad, Bank Islam Berhad, and Malaysia Building Society Berhad have a neutral volatility impact, making them attractive investments for those who desire lesser risk. Moreover, prospect investors would have better guidance on investment options in a new crisis, particularly if B.N.M. contemplates imposing a full blanket moratorium again.

In addition to benefiting investors, this research also provided advantageous results for B.N.M. Although implementing a full blanket moratorium during an unprecedented event could be advantageous for households or businesses, it may harm banks' stock price. Hence, B.N.M. must meticulously assess financial assistance measures to guarantee an equilibrium among the concerns of households, businesses, and shareholders. Policy actions have the potential to significantly impact stock prices. Nevertheless, B.N.M. has expanded its scope by offering a strategic plan for future crises, including those of comparable

magnitude to the COVID-19 global pandemic.

The COVID-19 pandemic has had a significant and far-reaching effect on the global economy and financial markets. Hence, the findings of this study have the potential to inspire further research. Therefore, this study solely emphasizes the full blanket moratorium, despite B.N.M. has implemented other measures to provide relief for loan repayments. Hence, there is a potential for varying responses from investors prior to and following the moratorium concerning the stock price of banks. One can further examine the variations in implementing full, partial, and post-moratorium to the volatility of stock prices.

Furthermore, these publicly listed banks demonstrated distinct market capitalization levels, with certain banks listed on the Kuala Lumpur Composite Index. Therefore, these banks may experience a different level of risk exposure and resilience during times of crisis. In addition to moratorium and shocks in volatility, this study also incorporated Half-life in determining the duration or persistence of the volatility. Interestingly, the volatility of all KLCI banks took a more extended day to decay, while non-KLCI banks took less than ten days to decay. This merits deeper investigation as it might benefit the prospective investor or fund manager. Thus, this study defers this subject to be addressed in future research.

REFERENCES

- ¹Statement extracted from The Edge news by the previous Finance Minister of Malaysia on the 31 December 2023. Statement: <https://theedgemaalaysia.com/article/zafrul-rm64b-estimated-losses-banks-during-moratorium-period>.
- ²Statement extracted from the press statement by The Association of Banks in Malaysia (A.B.M.) on the 31 December 2023. Statement: <https://www.abm.org.my/press-releases/media-statement-by-the-association-of-banks-in-malaysia/>.
- Acharya, V.V., Engle, R.F., & Steffen, S. (2021). Why did bank stocks crash during COVID-19? National Bureau of Economic Research.
- Adenomom, M.O., Maijamaa, B., & John, D.O. (2022). The effect of COVID-19 outbreaks on the Nigerian stock exchange performance: Evidence from GARCH model. *Journal of Statistical Modeling and Analytics*, 4(1).
- Ahadiat, A. & KESUMAH, F.S.D., (2021). Risk Measurement and Stock Prices during the COVID-19 Pandemic: An Empirical Study of State-Owned Banks in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(6), 819-828.
- Ahmed, R.R., Vveinhardt, J., Streimikiene, D., & Channar, Z.A. (2018). Mean reversion in international markets: Evidence from GARCH and half-life volatility models. *Economic Research-Ekonomska istrazivanja*, 31(1), 1198-1217.
- Almutair, S. (2015). Dynamics of the relationship between bank loans and stock prices in Saudi Arabia. *International Business and Economics Research Journal (IBER)*, 14(3): 439-452.
- Alzyadat, J.A., Abuhommous, A.A.A. & Alqaralleh, H., (2021). Testing the conditional volatility of saudi arabia stock market: Symmetric and asymmetric autoregressive conditional heteroskedasticity (GARCH) approach. *Academy of Accounting and Financial Studies Journal*, 25(2), 1-9.
- Batten, J.A., Choudhury, T., Kinatader, H. & Wagner, N.F., (2023). Volatility impacts on the European banking sector: G.F.C. and COVID-19. *Annals of Operations Research*, 330(1), 335-360.
- Bhatia, P. & Gupta, P., (2020). Sub-prime crisis or COVID-19: A comparative analysis of volatility in Indian banking sectoral indices. *FII Business Review*, 9(4), 286-299.
- Bhuvaneshwari, D. & Radhika, K.P. (2021). Impact of COVID-19 on the financial sector indices. *International Research Journal of Business Studies*, 14(2), 137-145.
- Black, F. (1976). The pricing of commodity contracts. *Journal of Financial Economics*, 3(1-2), 167-179.
- Bollerslev, T. (1986) Generalized autoregressive conditional heteroscedasticity. *Journal of Econometrics*, 31(3), 307-327.
- Bonga, W.G., Chimwai, L., Siyakiya, P. & Choga, I., (2022). Stock Market Volatility in Zimbabwe Stock Exchange during Pandemic Period. *Eurasian Journal of Economics and Finance*, 10(2), 68-82.

- Brooks, C. & Williams, L. (2022). When it comes to the crunch: Retail investor decision-making during periods of market volatility. *International Review of Financial Analysis*, 80, 102038.
- Ciotti, M., Cicciozzi, M., Terrinoni, A., Jiang, W.C., Wang, C.B., & Bernardini, S. (2020). The COVID-19 pandemic. *Critical Reviews in Clinical Laboratory Sciences*, 57(6), 365-388.
- Dana, A.N. (2016). Modelling and estimation of volatility using ARCH/GARCH models in Jordan's stock market. *Asian Journal of Finance and Accounting*, 8(1), 152-167.
- Dickey, D.A. and Fuller, W.A. (1979) Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366a), 427-431.
- Eledum, H. & Sayed, O.A., (2021). Asymmetric Modelling of COVID-19 related news persistence impact on Saudi Arabia stock market volatility. *International Journal of Ecology & Development*, 58-72.
- Ellul, A., Erel, I., & Rajan, U. (2020). The COVID-19 pandemic crisis and corporate finance. *The Review of Corporate Finance Studies*, 9(3), 421-429.
- Engle, R.F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. *Econometrica: Journal of The Econometric Society*, 987-1007.
- Engle, R.F. & Patton, A.J. (2001). What good is volatility model? *Quantitative Finance*, 1(2), 237.
- Fakhfekh, M., Jeribi, A. & Ben Salem, M., (2023). Volatility dynamics of the Tunisian stock market before and during the COVID-19 outbreak: Evidence from the GARCH family models. *International Journal of Finance & Economics*, 28(2), 1653-1666.
- Hu, L., Han, J., & Zhang, Q. (2018). The impact of monetary and fiscal policy shocks on stock markets: Evidence from China. *Emerging Markets Finance and Trade*, 54(8), 1856-1871.
- Ibrahim, M.H. (2006). Stock prices and bank loan dynamics in a developing country: The case of Malaysia. *Journal of Applied Economics*, 9(1), 71-89.
- Ibrahim, M.H. & Shah, M.E. (2012). Bank lending, macroeconomic conditions and financial uncertainty: Evidence from Malaysia. *Review of Development Finance*, 2(3-4), 156-164.
- Khan, M., Kayani, U.N., Khan, M., Mughal, K.S. & Haseeb, M. (2023). COVID-19 Pandemic & Financial Market Volatility; Evidence from GARCH Models. *Journal of Risk and Financial Management*, 16(1), 50.
- Lahmiri, S. (2017). A study on chaos in crude oil markets before and after 2008 international financial crisis. *Physica A: Statistical Mechanics and its Application*, 466, 389-395.
- Lin, Z. (2018). Modeling and forecasting the stock market volatility of S.S.E. Composite Index using GARCH models. *Future Generation Computer Systems*, 79, 960-972.
- Liu, F., Kong, D., Xiao, Z., Zhang, X., Zhou, A., & Qi, J. (2022). Effect of economic policies on the stock and bond market under the impact of COVID-10. *Journal of Safety Science and Resilience*, 3(1), 24-38.
- Nelson, D.B. (1991). Conditional heteroscedasticity in asset returns: A new approach. *Econometrica: Journal of the Econometric Society*, 347-370.
- Nikhil, M.N., Suman, C., Lithin, B.M., Sanket, S., & Satyakam. (2023). Modeling Indian bank Nifty volatility using univariate GARCH models. *Banks and Bank Systems*, 18(1), 127-138.
- Nurdany, A., Ibrahim, M.H. & Romadoni, M.F., (2021). The asymmetric volatility of the Islamic capital market during the COVID-19 pandemic. *Journal of Islamic Monetary Economics and Finance*, 7, 185-202.
- Oseni, I.O. & Nwosa, P.I. (2011). Stock market volatility and macroeconomic variable volatility in Nigeria: An exponential GARCH approach. *Journal of Economics and Sustainable Development*, 2(10), 28-42.
- Ozdemir, L., Ercan, O.Z.E.N., Grima, S., & Romanova, I. (2021). Determining the return volatility of major stock markets before and during the COVID-19 pandemic by applying the EGARCH model. *Scientific Annals of Economics and Business*, 68(4), 405-419.
- Phillips, P.C., and Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335-346.
- Putri, H.T. (2020). COVID-19 dan harga saham perbankan di Indonesia. *Eksis: Jurnal Ilmiah Ekonomi dan Bisnis*, 11(1), 6-9.
- Rosli, N., Pitchay, A.A., Azman, N.H.N., & Abd Jalil, M.I. (2023). Does bank's moratorium alleviate the burden of borrowers? Case of the pandemic COVID-19. *Malaysia Journal of Business and Economics*, 10(1), 43-57.
- Sah, N.I.M & Wong, W.Y. (2021). The impact of MCO on the stock market and moratorium on Banking sector's performance in Malaysia: The case of COVID-19. *Labuan Bulletin of International Business and Finance*, 19, 13-25.

- Samsi, S.M., Yusof, Z. & Cheong, K.C. (2018). The effect of global financial crisis on ASEAN growth: Evidence from stock market analysis. *DLSU Business and Economics Review*, 28(1), 1-33.
- Setiawan, B., Ben Abdallah, M., Fekete-Farkas, M., Nathan, R.J. & Zeman, Z. (2021). GARCH (1, 1) models and analysis of stock market turmoil during COVID-19 outbreak in an emerging and developed economy. *Journal of Risk and Financial Management*, 14(12), 1-19.
- Shah, A.U.M., Safri, S.N.A., Thevadas, R., Noordin, N.K., Abd Rahman, A., Sekawi, Z., Ideris, A., & Sultan, M.T.H. 2020. COVID-19 outbreak in Malaysia: Action taken by the Malaysian government. *International Journal of Infectious Diseases*, 97, 108-116.

ARE DIGITAL SPILLOVERS IMPORTANT FOR INNOVATION AND FIRM PRODUCTIVITY? EVIDENCE FROM MALAYSIAN MANUFACTURING SECTOR

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ABSTRACT

Industry 4.0 has prompted Malaysia's manufacturing firms to enhance their innovation and technological capabilities. Digital spillovers are vital in capturing the full impact of digitalization because the externalities created by digital adoption can be spread across the entire economy. However, scarce studies have considered digital spillovers in the analysis. This research uses the sequential CDM model to examine the relationships between firm characteristics, digital spillovers, innovation and productivity of Malaysian manufacturing firms. The firm-level data that comprises 14,723 Malaysian manufacturing firms is used for data analysis. The results reveal that the firm characteristics and horizontal digital spillover positively influence innovation and firm productivity, as opposed to the backward digital spillover. On the other hand, the effects of internal and forward digital spillovers on the innovation output and firm productivity are relatively mixed. It suggests that manufacturing firms respond differently to information flows from various stakeholders on digital platforms, applying them uniquely to their production methods and business operations. The government is encouraged to support manufacturing firms, especially the SMEs, in leveraging digitalization to improve their performance and competitiveness.

INTRODUCTION

In the 21st century, the world has transitioned into the era of Industrial Revolution 4.0 (IR4.0). Concurrently, the concept of “Industry 4.0” was introduced within the manufacturing sector, accompanied by the emerging ideas of smart manufacturing, smart factories and the Internet of Things (IoT) (World Economic Forum, 2019). These concepts have driven the global manufacturing sector to undergo a significant technological transformation because their implementation necessitates the extensive use of disruptive technologies, such as robotics, artificial intelligence (AI) and cloud computing.

The manufacturing sector is the economic backbone of many countries, including Malaysia. According to the Department of Statistics Malaysia [DOSM] (2023a) and World Bank Group (2024), the manufacturing sector has contributed approximately one-quarter of the gross domestic product (GDP) and plays a significant role in job creation. In addition, the manufacturing sector has acted as a crucial buffer for Malaysian economic growth during external shocks, as demonstrated by its quick recovery in both production and employment rates following the COVID-19 pandemic (Economic Planning Unit [EPU], 2023; DOSM, 2023b). The manufacturing sector is also the key exporter in Malaysia, accounting for more than 65% of the merchandise exports (World Bank Group, 2024).

In order to embrace the concept of Industry 4.0, Malaysian manufacturing firms are forced to enhance their innovation and technological capabilities to keep up the sectoral competitiveness (Ministry of International Trade and Industry [MITI], 2018). Innovation capabilities are essential for modifying business operations by integrating disruptive technologies into existing production and management methods. Meanwhile, technological capabilities are needed to leverage information and

communication technologies (ICT) to use the disruptive technologies effectively.

PROBLEM STATEMENT

Although innovation and technological capabilities are vital elements in implementing the idea of Industry 4.0, Malaysia's innovation capability is insufficient to support the technological transformation, as evident in Malaysia's declining international innovation ranking (World Intellectual Property Organization [WIPO], 2022; Jamrisko et al., 2021). At the same time, the level of ICT usage that is closely related to the digital technologies essential for Industry 4.0—such as cloud computing, data analytics, and online collaborative platforms—remained lower than expected, despite the manufacturing sector having the highest ICT usage among all economic sectors (DOSM, 2021).

On the other hand, concerns have been raised about measuring the full impact of digitalization. Past studies have predominantly focused on the direct effect of digitalization, but Xu and Cooper (2017) and Marsh et al. (2017) proposed that this approach may underestimate the full impact of digitalization and lead to misleading analysis. They argued that it is essential to also incorporate the indirect effect, which they coined as the “digital spillover effect”, in the analysis. The “digital spillover” is defined as the creation of external knowledge or information flow via digital channel or platform (Xu & Cooper, 2017).

RESEARCH OBJECTIVE

This study aims to examine the relationships between digitalization, innovation and firm productivity in the Malaysian manufacturing sector using the Crepon-Duguet-Mairesse (CDM) model proposed by Crépon et al. (1998).

LITERATURE REVIEW

The theoretical foundation of this research lies in the Schumpeter's Theory of Innovation. Schumpeter (1934) perceived that innovation is the outcome of research and development and it is essential for a firm to increase its efficiency and productivity. In turn, it helps a firm to retain its competitive advantage in the market. Past studies have confirmed that innovation has a positive impact on enhancing firm efficiency (Dai & Sun, 2021; Khachoo et al., 2018; Mariev et al., 2022). Collectively, innovation can achieve the long-run industrial growth as well as the national economic growth.

Griliches (1979) explained that innovation is a double-edged knife to a firm. If the innovation is succeeded, the firm productivity can be enhanced. Otherwise, the opportunity cost for innovation is the high sunk cost which is irrecoverable. Thus, the decision to invest in innovation highly depends on the potential marginal return obtained by the firm. Empirical studies have proven the positive relationship between innovation input and innovation output, both in developed countries (Audretsch & Belitski, 2020; Giotopoulos et al., 2023) and developing countries (Khachoo et al., 2018; Younas & ul-Husnain, 2022; Zhu et al., 2021).

Organisation for Economic Cooperation and Development [OECD] (2018) refers innovation activities as the full spectrum of actions, starting from the early phase of innovation investment until the last stage of implementing the innovation output. Past researchers have found a significant relationship between firm characteristics and innovation activities, for example, the firm size, role of an exporter, market share etc (Giotopoulos et al., 2023; Mariev et al., 2022; Montégu et al., 2022). It is observed that the firm characteristics factors that driving a firm's involvement in the innovation activities can be categorised into two aspects, i.e. its access to innovation resources and its desire to maintain competitiveness in the market.

Firm size and industry group secure a firm's accessibility to the resources needed for innovation activities. Giotopoulos et al., (2023), Ma et al., (2022) and Ouyang et al. (2022) discovered that large firms have stronger financial foundations and better access to financing channels, making them have high innovation investment and greater resilience in managing innovation activities. Nonetheless, some researchers revealed that SMEs tend to invest in research and development because they want to leverage the innovation to get a higher market share even if they may face limited resources and have a higher chance of failing the innovation (Edeh & Acedo, 2021; Viglioni & Calegario, 2021).

Similar evidence is shown by the industry group. A firm located in high-technological industries or high-productive industries has a higher intention to carry out research and development due to the industry requirement where they need to apply the latest technology in their operation (Audretsch & Belitski, 2020; Mariev et al., 2022). Alike to Malaysian manufacturing firms which belong to high-technological industries, they abound with resources and talents that are required for innovation (Ong et al., 2019; Shafi'l & Ismail, 2015).

Based on the Theory of Innovation, a firm's market share is the main driver of innovation because it grants a firm market position and influential power (Schumpeter, 1934). Aghion et al. (2018) and Montégu et al. (2022) have proven the positive relationship between market share and innovation output. Aghion et al. (2018) even discovered that productive firms have a higher tendency to innovate as compared to non-productive firms as the former is dealing with tough competition. Likewise, Ong et al. (2019) and Shafi'l and Ismail (2015) reached the same conclusion when they studied the impact of market share on innovation among Malaysian manufacturing firms.

On the other hand, past studies proposed that an exporting firm is likely to undertake innovative tasks to sustain its international competitiveness, see Jitsutthiphakorn (2021), Fedyunina and Radosevic (2022) and Zabłocka and Tomaszewski (2024). In addition, Santana et al. (2011) commented that the positive impact of innovation output on the firm productivity is even stronger among exporters and importers. However, Ong et al. (2019) found that the exporting firms in developing countries have no motivation for innovation when rules and regulations imposed on the exported goods are strict.

The main difference between this study and the previous innovation literature is the inclusion of “digital spillover effects”. Based on the categorisation of Xu and Cooper (2017), internal digital spillover refers to knowledge sharing within a firm through the use of internal digital channels, such as intranet, email, and online collaboration platforms. It represents the direct effect of a firm’s digitalization. Meanwhile, external digital spillovers refer to external knowledge shared by the firm’s competitors (horizontal spillover), suppliers (backward spillover) and retailers (forward spillover) via the digital platforms. They represent the indirect effects of a firm’s digitalization.

OECD (2018) and Silva (2021) agreed with Marsh et al. (2017) and Xu and Cooper (2017), saying that the information flowing within and beyond the firm can be the catalyst for a firm to conduct innovation activities. Empirically, Khalifa (2023) and Zhu et al. (2021) confirmed the complementary effects between R&D and ICT investment in fostering innovation. From a broader perspective, the regional digital spillover effects facilitate knowledge diffusion and contribute to the formation of an innovation system in a country (Yang & Wang, 2022).

The backward and forward digital spillovers propel innovation activities because the information flow generated helps the firm understand its suppliers’ requirements and customers’ demands better, as found by Karhade and Dong (2021) and Mendoza (2024).

However, the horizontal digital spillover is found to be insignificant in affecting a firm’s innovation activities because competitors tend to avoid disclosing too much information on publicly accessible online platforms, as they prefer to protect their business secrets to maintain their market position (Paunov & Rollo, 2016).

In terms of firm productivity, empirical evidence showed that the internal digital spillover improves the firm productivity by a firm (Khalifa, 2023; Lee et al., 2020; Yap et al., 2020). Nonetheless, the concept of the “Solow Paradox” suggests that the impact of digital technology on productivity can initially be minimal. Han et al. (2017) explained that the relationship between digital assets and productivity exhibits a dynamic U-shaped relationship, signalling that firms require time to realize the benefits of their digital investments. The recent study by Zhu et al. (2021) also proved that even though the ICT investment positively affects innovation the positive effect was not captured in the firm productivity.

Similarly, the effect of external digital spillovers on the firm productivity is relatively mixed. Paunov and Rollo (2016) supported that the horizontal digital spillover helps boost the firm productivity, especially the SMEs, because it facilitates the manufacturing SMEs to absorb the knowledge that relates to the latest technology at a lower cost. Nonetheless, the significance of the backward and forward digital spillover depends on the “knowledge network” applied by the firm (Paunov & Rollo, 2016). The negative and insignificant relationships between external digital spillover effects and firm productivity are detected by Marsh et al. (2017) and Mendoza (2024).

METHODOLOGY

The Crepon-Duguet-Mairesse (CDM) model was founded by Crépon et al. (1998) to study the relationship between innovation and firm productivity using firm-level data, instead of sectoral and national data. In addition, the CDM model allows the incorporation of firm characteristics and a broader set of interested variables, making it a popular method in the field of innovation studies. In this study, the digital spillover effects are added to the CDM model as the model extension.

The CDM model is a recursive system consisting of three stages: innovation input, innovation output, and productivity. Three stages are treated with different estimation techniques due to the different nature of the data (Crépon et al., 1998).

Stage 1: Innovation Input

The innovation input stage is estimated using Heckman's two-step model (Crépon et al., 1998). It begins with the estimation of the selection equation via the Probit model, examining the intention of a firm in investing in R&D expenditure (r_{ij}^*). Then, the response equation is used to estimate the level of R&D expenditure (rd_{ij}) via the Least Square method.

Selection function:

$$r_{ij}^* = \alpha_1 + \alpha_2 dbig_{ij} + \alpha_3 dmed_{ij} + \alpha_4 dind_{ij} + \alpha_5 \log(ex_{ij}) + \alpha_6 \log(rms_{ij}) + \alpha_7 \log(it_{ij}) + \alpha_8 \log(soi_{ij}) + \alpha_9 \log(sob_{ij}) + \alpha_{10} \log(sof_{ij}) + v_{ij} \text{-----} (Eq1)$$

Response function:

$$\log(rd_{ij}) = \beta_1 + \beta_2 dind_{ij} + \beta_3 \log(ex_{ij}) + \beta_4 \log(rms_{ij}) + \beta_5 \log(it_{ij}) + \beta_6 \log(soi_{ij}) + \beta_7 \log(sob_{ij}) + \beta_8 \log(sof_{ij}) + \epsilon_{ij} \text{-----} (Eq2)$$

Both equations share the same variables of firm characteristics, including the industry group (ind_{ij}), export volume (ex_{ij}), and firm market share (rms_{ij}). Nevertheless, the firm size (big_{ij} and $dmed_{ij}$) is included only in the selection equation as the exclusion restriction for the identification purpose because the scale of R&D investment is implied by the firm size (Gujarati, 2021; Khachoo et al., 2018; Zhang & Islam, 2022). Meanwhile, the internal digital spillover is proxy by the digital expenditure (it_{ij}). The external digital spillovers are represented by horizontal spillover (soi_{ij}), backward spillover (sob_{ij}) and forward spillover (sof_{ij}).

The selection equation is essential for the researchers to determine whether to include those non-reporting R&D firms in the data estimation. Heckman (2013) explained that even though a firm does not formally report any R&D expenditure in the innovation survey, it does not mean that the firm does not have the

intention to carry out R&D activities in the future or was not involved in some R&D activities in prior time. If the researchers excluded these firms from the sample, it would raise the issue of selection bias, which could produce inaccurate estimates and biased analysis.

It is essential to deal with the selectivity issue in the context of the Malaysian manufacturing sector because small and medium enterprises (SMEs) have accounted for more than 97% of the manufacturing sector but a majority of them are not involved in innovation activities due to the difficulties in recruiting high-performing talents and securing funding (EPU, 2021; MITI, 2018). Moreover, Shafi'i and Ismail (2015) also mentioned that not all Malaysian manufacturing firms, including large firms, which are involved in innovation activities have formally reported their involvement in R&D.

Stage 2: Innovation Output

The innovation output stage examines whether a firm successfully realizes an innovation output via the Probit Model. Following the practice of Crépon et al., (1998) and Khachoo et al. (2018), “patent” is used as the proxy of innovation output. To alleviate the problem of endogeneity, the dependent variable in Eq3 is the forecasted R&D expenditure from Eq2, as suggested by Khachoo et al. (2018) and Shafi’l and Ismail (2015).

Innovation output function:

$$p_{ij} = \chi_1 + \chi_2 \log(rd_{ij}^*) + \chi_3 dbig_{ij} + \chi_4 dmed_{ij} + \chi_5 dind_{ij} + \chi_6 \log(ex_{ij}) + \chi_7 \log(rms)_{ij} + \chi_8 \log(lhs_{ij}) + \chi_9 \log(it_{ij}) + \chi_{10} \log(soi_{ij}) + \chi_{11} \log(sob_{ij}) + \chi_{12} \log(sof_{ij}) + \omega_{ij} \text{-----} (Eq3)$$

In Eq3, the same vector of firm characteristics used in the innovation input is applied. Moreover, the high-skilled labourers (lhs_{ij}) are included in Eq3 because it is believed that they are important in achieving innovation outcomes.

Stage 3: Firm Productivity

The final stage of the CDM model involves the estimation of firm productivity via the Ordinary Least Square (OLS) estimator. The production function is an augmented Schumpeterian endogenous growth model that is structured in the Cobb-Douglas general form, as demonstrated by Udeogu et al. (2021). The forecasted innovation output (dpt_{ij}^*) is derived from the second stage, while the capital intensity of the firm (kw_{ij}) and the ratio of high-skilled labour (lhw_{ij}) are the two main variables in the Cobb-Douglas production function. All independent variables in the production function are in per-labour form except the forecasted innovation output.

Production function:

$$\log y_{ij} = \eta_1 + \eta_2 dpt_{ij}^* + \eta_3 \log(kw_{ij}) + \eta_4 \log(lhw_{ij}) + \eta_5 \log(itw_{ij}) + \eta_6 \log(soiw_{ij}) + \eta_7 \log(sobw_{ij}) + \eta_8 \log(sofw_{ij}) + \omega_{it} \text{-----} (Eq4)$$

Measurement of Digital Spillovers

The measurement of internal digital spillover is straightforward by using the ICT expenditure spent by a firm, adopting Xu and Coopeer’s (2017) practice. Meanwhile, the measurement of external digital spillovers follows the procedures of Marsh et al. (2017). The horizontal spillover is calculated by dividing the total ICT expenditure by the total labour at the industry level. In contrast, the measurement of backward and forward digital spillover is relatively complex as it depends on the transaction intensity between industries. The spillover effect happens when there is an inter-industry intermediate buying and selling

transaction carried out between industries i and j , otherwise, the weightage of and become zero.

$$\text{Horizontal digital spillover effect: } SOI = \frac{\sum_{i \in j} ICT_{ij}}{\sum_{i \in j} L_{ij}}$$

$$\text{Backward digital spillover effect: } SOB = \sum_{j \neq i} \frac{\alpha_{ij}}{x_i} ICT_j$$

$$\text{Forward digital spillover effect: } SOF = \sum_{j \neq i} \frac{\beta_{ij}}{x_i} ICT_j$$

Where represent the ICT expenditure spent in industry j meanwhile the is the total employment in industry j . The is the total amount of intermediate input that industry i bought from their suppliers (industry j), while is the total amount of intermediate output that industry i sold to their customers (industry j). The total amount of inter-industry transactions of industry i is represented by.

DATA SOURCE

The CDM model needs a large amount of firm-level data for estimation, but the availability of the firm-level data remains the main challenge in the study. This issue causes a period gap between the year of study and the sample period, see Audrestch and Belitski (2020), Khachoo et al. (2018), Shafi'l and Ismail (2015), Xu and Cooper (2017) and Zhu et al. (2021). The same difficulty arises in this study.

The data applied in this study is the unpublished firm-level data provided by the DOSM upon official request. There are a total of 14,723 firms in the sample size, accounting for 30% of microdata in Malaysia's manufacturing sector based on the 2016 Economic Census (the fourth economic census). Although the data collection of the 2023 Economic Census (the fifth economic census) was completed in

2023, the firm-level data is not available to the public.¹ As a result, the data extracted from the 2016 Economic Census is the best sample that can be applied to this study. In order to tally with the period of firm-level data, the industry-level data used in the study was extracted from the Annual Economic Statistics Manufacturing 2015 and the Report on Annual Survey of Manufacturing Industries 2015. Meanwhile, the 2015 Input-Output Tables are used for the calculation of digital spillovers.

FINDINGS

Table 1 shows the estimation results of both innovation input and innovation output functions. The z-statistics are reported for Eq1 and Eq3 because both equations are estimated using the Probit Model. Meanwhile, the t-statistic is reported for Eq2 as the Least Square Method is applied.

¹ For more information on the Economic Census, the reader may refer to the website <http://economiccensus.dosm.gov.my/ec2/index.php/en/info-banci-ekonomi/sejarah-banci>

Table 1. Results of the Innovation Input and Innovation Output

	Innovation Input			Innovation Output
	Eq1 z-statistic	Eq2 t-statistic		Eq3 z-statistic
Firm characteristics				
$dbig_{ij}$	0.5562***	-		0.7774***
$dmed_{ij}$	0.2978***	-		0.1420
$dind_{ij}$	0.2869***	0.9084***		0.4384***
ex_{ij}	0.0499***	0.0867***		0.0171*
rms_{ij}	0.2001***	0.6304***		0.2819***
rd^*_{ij}	-	-		0.1578***
lhs_{ij}	-	-		0.0555
Digital spillover effects				
it_{ij}	0.08132***	0.1950***		0.1393***
soi_{ij}	0.3380***	0.8467**		0.122***
sob_{ij}	-0.0702	-0.1767		-0.3448***
sof_{ij}	-0.1295***	-0.2239**		-0.2771**

The denotation of ***/**/* represents the 1%, 5% and 10% significance level respectively.

The results show the firm size, industry type and firm's market share positively affect the innovation input and innovation output. These findings are consistent with Giotopoulos et al. (2023), Mariev et al. (2022), and Zabłocka and Tomaszewski (2024). The significance of the industry type and market share demonstrates the validity of Schumpeter's Theory of Innovation in the context of Malaysia's manufacturing sector. However, even if the medium-sized firm positively affect a firm's intention in R&D investment and the R&D intensity, the positive effect discontinues in realizing the patent issuance. Yang and Wang (2022) argued that the high prices of innovation resources induced by the competition might restrict the less advantaged firms from continuously participating in the innovation wave.

On the other hand, the results of digital spillovers are consistent across the innovation input and innovation output estimations. The internal digital spillover has a positive impact on innovation activities as expected because it drives knowledge sharing within firms which fosters brainstorming and new idea generation (Silva, 2021; Xu and Cooper, 2017). In addition, the result reveals that the horizontal digital spillover carries the highest influential power on innovation activities, implying a potential mimicking behaviour in Malaysia's manufacturing sector where firms tend to follow the competitors' innovation strategies.

Nevertheless, the forward spillover negatively influences the R&D investment and patent issuance, which is inconsistent with the conclusion reached by Karhade and Dong (2021) and Paunov and Rollo (2016). This result may indicate that when Malaysian manufacturing firms receive customer feedback quickly via digital platforms at almost zero cost, they can directly modify their products accordingly without the need for innovation (MOSTI & MASTIC, 2020). Moreover,

manufacturing firms can bypass the trial-and-error process and reduce concerns over the significant costs of failed innovations.

In addition, the backward digital spillover is found to negatively affect the innovation output even though the negative impact is not significant on the innovation input. Mendoza (2024) and Marsh et al. (2017) explained that there might be a technology gap between the manufacturing firm and its suppliers, which causes the information flow from the upstream industries to be a barrier for the manufacturing firm. Thus, it discouraged the firm from carrying out innovation activities by applying the knowledge transferred by its suppliers via digital platforms.

For the production function, it is found to suffer from the heteroskedasticity issue, thus the OLS estimator is adjusted with the Huber-White covariance method and the result is presented in Table 2. The result reflects that the patent issuance, capital intensity and ratio of high-skilled labour are found to affect firm productivity positively, consistent with the findings of Dai and Sun (2021), Khachoo et al. (2018), and Mariev et al. (2022). It is an encouraging finding that the innovation output has the highest influential power in boosting the firm productivity.

Similarly, the horizontal and forward digital spillovers reveal positive associations with firm productivity, as supported by Khalifa (2023), Lee et al. (2020) and Yap et al. (2020). The horizontal spillover is found to be the most significant channel in enhancing firm productivity, proving that manufacturing firms gain valuable insights from analysing their competitors' production methods and business practices through digital platforms, which enable them to adjust their strategies effectively. The same conclusion can be drawn regarding the information flow from the retailers.

Table 2. Result of the Production Function Estimation

	Eq4 t-statistic
Firm characteristics	
dpt_{ij}^*	0.3613***
kw_{ij}	0.3492***
lhw_{ij}	0.0092***
Digital spillover effects	
itw_{ij}	-0.0191***
$soiw_{ij}$	0.2721***
$sobw_{ij}$	-0.4074***
$sofw_{ij}$	0.1372***

The denotation of ***/**/* represents the 1%, 5% and 10% significance level respectively.

In contrast, the internal and backward digital spillovers have negative influences on the firm productivity. The result indicates that the “Solow Paradox” was present among Malaysian manufacturing firms, suggesting the possibility that the relationship follows a U-shaped pattern (Han et al, 2017). Meanwhile, the negative backward digital spillover suggests that Malaysian manufacturing firms might rely more on offline knowledge networks, such as face-to-face meetings or physical visits, to obtain information that can be integrated into their business operations, as suggested by Paunov and Rollo (2016). Meanwhile, Mendoza (2024) explained that the knowledge shared by suppliers on digital platforms might be complex, causing manufacturing firms to take time to internalize this external knowledge for its use.

CONCLUSION

This study has validated the relationships between firm characteristics, digital spillovers, innovation and firm production via the CDM model. The results of the data analyses have confirmed the significance of both direct and indirect effects of digitalization on innovation activities and firm productivity. It highlights the importance of including digital spillover

effects in the study of digitalization, as its exclusion may lead to misleading conclusions and ineffective policy recommendations.

Given the importance of digitalization in fostering innovation, the policymakers are recommended to support the firms to leverage their digital capabilities in boosting firm productivity. With higher digital readiness, manufacturing firms can better utilize the effects of digitalization, enabling them to respond more strategically and agilely to evolving market dynamics. On the other hand, the management team of the manufacturing firm should consider increasing their investment in digitalization to enhance operational efficiency and remain competitive in a rapidly changing market.

Similar to other CDM studies, this research is constrained by limitation in data availability. The sample size required for the CDM model is huge but the firm-level innovation and digital data available in Malaysia are mostly unpublished and they can only be obtained upon approval from the authority parties. Future researchers are recommended to re-run the CDM model when the latest firm-level data is available.

REFERENCES

Aghion, P., Bergeaud, A., Lequien, M., & Melitz, M. J. (2018). *The impact of exports on innovation: Theory and evidence* (p. 678). Cambridge, MA: National Bureau of Economic Research.

Audretsch, D. B., & Belitski, M. (2020). The role of R&D and knowledge spillovers in innovation and productivity. *European economic review*, 123, 103391.

Crépon, B., Duguet, E., & Mairessec, J. (1998). Research, Innovation and Productivity [Ty: An Econometric Analysis at The Firm Level. *Economics of Innovation and new Technology*, 7(2), 115-158.

Dai, X., & Sun, Z. (2021). Does firm innovation improve aggregate industry productivity? Evidence from Chinese manufacturing firms. *Structural Change and Economic Dynamics*, 56, 1-9.

- Department of Statistics Malaysia (DOSM). (2021). *Malaysia Digital Economy*. Retrieved April 20, 2022, from <https://v2.dosm.gov.my/portal-main/release-content/malaysia-e-commerce-income-soared-17.1-percent-to-rm279.0-billion-in-the-third-quarter-2021>.
- Department of Statistics Malaysia (DOSM). (2023a). *Employment Statistics 2023*. Retrieved Jan 14, 2024, from <https://newss.statistics.gov.my/newss-portalx/ep/epFreeDownloadContentSearch.seam?cid=343133>.
- Department of Statistics Malaysia (DOSM). (2023b). *Labour Productivity First Quarter 2023*. Retrieved August 18, 2023, from <https://newss.statistics.gov.my/newss-portalx/ep/epDownloadContentSearch.seam?cid=1466>.
- Department of Statistics Malaysia (DOSM). (2024). *Economic Census History*. Retrieved Jan 18, 2024, from http://economiccensus.dosm.gov.my/ec2/index.php/en/info-banci-ekonomi/sejarah-banci.
- Economic Planning Unit (EPU). (2021). *National Fourth Industrial Revolution (4IR) Policy*. Putrajaya: EPU, Prime Minister's Department.
- Economic Planning Unit (EPU). (2023). *Socio Economic Statistics-National Accounts*. Retrieved April 25 2023, from <https://www.epu.gov.my/en/socio-economic-statistics/socio-economic/national-accounts>.
- Edeh, J. N., & Acedo, F. J. (2021). External supports, innovation efforts and productivity: Estimation of a CDM model for small firms in developing countries. *Technological Forecasting and Social Change*, 173, 121189.
- Fedyunina, A., & Radosevic, S. (2022). The relationship between R&D, innovation and productivity in emerging economies: CDM model and alternatives. *Economic Systems*, 46(3), 100998.
- Giotopoulos, I., Kritikos, A. S., & Tsakanikas, A. (2023). A lasting crisis affects R&D decisions of smaller firms: the Greek experience. *The Journal of Technology Transfer*, 48(4), 1161-1175.
- Griffith, R., Huergo, E., Mairesse, J., & Peters, B. (2006). Innovation and productivity across four European countries. *Oxford review of economic policy*, 22(4), 483-498.
- Griliches, Z. (1979). Issues in assessing the contribution of research and development to productivity growth. *Bell Journal of economics*, 10(1), 92-116.
- Gujarati, D. N. (2021). *Essentials of econometrics*. Sage Publications.
- Han, Z., Liu, M., & Rui M. (2017). Direct and indirect effects of informatization on productivity: Mediation role of labor's skill structure. *Technology and Economy*, 36(07), 56-65.
- Heckman, J. (2013). Sample selection bias as a specification error. *Applied Econometrics*, 31(3), 129-137.
- Jamrisko, M., Lu, W., & Tanzi.A., (2021, February 4). *South Korea leads world in innovation as US exits top ten*. Retrieved May 8, 2022, from <https://themalaysianreserve.com/2021/02/04/south-korea-leads-world-in-innovation-as-us-exits-top-ten/>.
- Jitsutthiphakorn, U. (2021). Innovation, firm productivity, and export survival: firm-level evidence from ASEAN developing countries. *Journal of Economic Structures*, 10(1), 1-17.
- Karhade, P., & Dong, J. Q. (2021). Information technology investment and commercialized innovation -performance: Dynamic adjustment costs and curvilinear impacts. *MIS Quarterly*, 45(3), 1007-1024.
- Khachoo, Q., Sharma, R., & Dhanora, M. (2018). Does proximity to the frontier facilitate FDI-spawned spillovers on innovation and productivity? *Journal of Economics and Business*, 97, 39-49.
- Khalifa, A.B. (2023). Impact of research and development (R&D) and information, and communication technology (ICT) on innovation and productivity evidence from Tunisian manufacturing firms. *Economics of Transition and Institutional Change*, 31(2), 341-361.
- Lee, J. W., & Song, E. (2020). Aging labor, ICT capital, and productivity in Japan and Korea. *Journal of the Japanese and International Economies*, 58, 101095.
- Ma, C. A., Xiao, R., Chang, H. Y., & Song, G. R. (2022). Founder management and innovation: An empirical analysis based on the theory of planned behavior and fuzzy-set qualitative comparative analysis. *Frontiers in Psychology*, 13, 827448.
- Mariev, O., Nagieva, K., Pushkarev, A., Davidson, N., & Sohag, K. (2022). Effects of R&D spending on productivity of the Russian firms: does technological intensity matter? *Empirical Economics*, 1-25.
- Marsh, I. W., Rincon-Aznar, A., Vecchi, M., & Venturini, F. (2017). We see ICT spillovers everywhere but in the econometric evidence: a reassessment. *Industrial and Corporate Change*, 26(6), 1067-1088.

- Mendoza, A. R. (2024). Technological Innovation, Productivity, and Global Value Chains Participation of Philippine Manufacturers. *The Developing Economies*.
- Ministry of Investment, Trade and Industry (MITI). (2018). *National Industry 4.0 Policy Framework*. Kuala Lumpur: MITI.
- Montégu, J. P., Pertuze, J. A., & Calvo, C. (2022). The effects of importing activities on technological and non-technological innovation: evidence from Chilean firms. *International Journal of Emerging Markets*, 17(7), 1659-1678.
- Ministry of Science, Technology and Innovation (MOSTI), & Malaysian Science and Technology Information Centre (MASTIC). (2020). National Survey of Innovation 2018: Manufacturing and Services Sectors in Malaysia. Putrajaya: Federal Government Administrative Centre.
- Ong, C. H., Tan, M. K., Lim, L. P., Tan, O. K. & Goh, C. F., (2019). Determinants of Innovative Performance in the Manufacturing Industry in Malaysia. *International Journal of Academic Research in Business & Social Sciences*, 9(1), 380-387.
- Organization for Economic Co-operation and Development, OECD (2018). *Oslo manual: Guidelines for collecting and interpreting innovation data*. Committee for Scientific and Technological Policy, OECD-OCDE, Paris.
- Ouyang, X., Liu, Z., & Zhang, Y. (2022). Firm Size, Radical and Incremental Innovation: A Meta-Analysis Based on The Awareness-Motivation-Capability Perspective. *International Journal of Innovation Management*, 26(06). <https://doi-org.libezp2.utar.edu.my/10.1142/S1363919622500438>.
- Paunov, C., & Rollo, V. (2016). Has the internet fostered inclusive innovation in the developing world? *World Development*, 78, 587-609.
- Santana, S. K. S., Cavalcanti, S., & Bezerra, J. (2011). "The role of innovation in industry productivity: a sectoral approach." Foz do Iguaçu: Anais do 39th National Meeting of Economics, ANPEC.
- Schumpeter, J. (1934). *The Theory of Economic Development*. Oxford University Press, New York.
- Shafi'i, M., & Ismail, N. W. (2015). Innovation and Productivity: Evidence from Firms Level Data on Malaysian Manufacturing Sector. *International Journal of Economics & Management*, 9(1).
- Silva, A. L. (2021). Innovation in development cooperation: emerging trajectories and implications for inclusive sustainable development in the 21st century. *Innovation and Development*, 11(1), 151-171.
- Skorupinska, A. A., & Torrent Sellens, J. (2014). *ICT, innovation and productivity: evidence from Eastern European manufacturing firms* (No. DWP14-003). IN3 Working Paper Series.
- Udeogu, E., Amakom, U., & Roy-Mukherjee, S. (2021). Empirical Analysis of an Augmented Schumpeterian Endogenous Growth Model. *Journal of Economic Development*, 46(1), 53-84.
- Viglioni, M. T. D., & Calegario, C. L. L. (2021). How firm size moderates the knowledge and affects the innovation performance? Evidence from Brazilian manufacturing firms. *Revista Ibero-Americana de Estratégia*, 20, 15567.
- World Bank Group. (2024). *World Development Indicators (Malaysia)*. Retrieved January 12, 2024, from <https://databank.worldbank.org/source/world-development-indicators#>
- World Economic Forum (WEF). (2019). *Fourth Industrial Revolution*. Retrieved December 3, 2019, from <https://www.weforum.org/focus/fourth-industrial-revolution>.
- World Intellectual Property Organization (WIPO). (2022). *Global Innovation Index 2022: What is the future of innovation-driven growth?* Geneva: Switzerland.
- Xu, W., & Cooper, A. (2017). Digital Spillover: Measuring the True Impact of the Digital Economy. *A Report by Huawei and Oxford Economics, Oxford, United Kingdom*, <https://www.oxfordeconomics.com/recentreleases/digital-spillover>.
- Yang, L., & Wang, S. (2022). Do fintech applications promote regional innovation efficiency? Empirical evidence from China. *Socio-Economic Planning Sciences*, 101258.
- Yap, L. H., Ahmad, S. B., & Hoe, C. H. (2020). Organisational capability on ICT support and SMEs' performances in Malaysia. *Utopia y Praxis Latinoamericana*, 25(10), 271-282.
- Younas, M. Z., & ul-Husnain, M. I. (2022). Role of market structure in firm-level innovation: an extended CDM model for a developing economy. *Decision*, 49(1), 91-104.
- Zabłocka-Abi Yaghi, A., & Tomaszewski, T. (2024). The interdependence of R&D, innovations, and productivity: case of Polish manufacturing companies. *Ekonomia i Prawo. Economics and Law*, 23(1), 195-212.
- Zhang, J., & Islam, M. S. (2022). The role of market power in driving innovation and productivity: a firm-level study of emerging ASEAN. *International Journal of Emerging Markets*, 17(8), 1865-1888.
- Zhu, F., Li, Q., Yang, S., & Balezentis, T. (2021). How ICT and R&D affect productivity? Firm level evidence for China. *Economic Research-Ekonomska Istraživanja*, 1-19.

ENVIRONMENTAL ATTITUDE AS MEDIATOR IN SUSTAINABLE FOOD CONSUMPTION INTENTION AMONG YOUTH CONSUMERS IN MALAYSIA

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ABSTRACT

Sustainable food consumption (SFC) stands as a critical solution to address the urgent global challenges posed by food security, environmental degradation, and public health concerns. Amidst issues like climate change and resource depletion, transitioning to sustainable food systems becomes imperative for safeguarding the well-being of current and future generations. This study aims to investigate the impact of environmental attitudes and environmental concerns on SFC intention among Malaysian university students. Additionally, the research seeks to examine the mediating role of environmental attitude in the relationship between environmental concern and SFC intention. Utilizing structural equation modelling in SPSS AMOS, the findings reveal significant positive influences of both environmental attitude and environmental concern on SFC intention. Environmental attitude is found to partially mediate the relationship between environmental concern and SFC intention. Fostering positive environmental attitudes and increasing environmental concern among individuals can encourage the adoption of SFC practices, contributing to mitigating environmental degradation and promoting a healthier planet for future generations. This study contributes to academia by providing empirical evidence on the determinants of SFC intention among Malaysian university students, filling a gap in the literature on SFC in the Malaysian context. It provides insights

for policymakers, highlighting the significance of addressing psychological factors to promote SFC behaviours among youth. Practitioners can utilize these findings to design targeted interventions and educational campaigns, fostering environmentally conscious attitudes and behaviours among consumers.

INTRODUCTION

The challenges posed by climate change and the future of food security loom large over contemporary society, with prevailing dietary norms exerting profound effects on these pressing global concerns (Owino et al., 2022). The consumption and production of food significantly affect environmental sustainability, with shifts in dietary habits also contributing to various health-related concerns (Vermeir et al., 2020). Consequently, there exists an urgent necessity to enact transformative changes in consumer behavior with regard to food consumption. This imperative is rooted in the dual objectives of ensuring a resilient food supply and promoting the holistic health of individuals and the planet (Ammann et al., 2023; Hoek et al., 2021).

In recent times, the topic of sustainable food consumption (SFC) has garnered considerable interest on a global scale, owing to its pivotal importance in tackling pressing global issues such as climate change, food security, and public health (Herrero et al., 2023). The escalating concerns surrounding sustainability in the food sector have spurred research efforts aimed at understanding consumer behavior and preferences towards sustainable food choices (Vermeir et al., 2020). As consumers become more aware of the environmental and social impacts of their food choices, they are increasingly seeking transparent information and ethically sourced products that reflect their values and beliefs. This shift towards SFC reflects a broader societal movement towards more responsible and environmentally friendly lifestyles,

necessitating comprehensive strategies to promote sustainable food practices across various sectors.

Malaysia's urban population has been steadily increasing, resulting in a shift towards urban lifestyles characterized by convenience-oriented food choices (Azman et al., 2023). The fast-paced nature of city life often encourages the consumption of convenience foods, which are typically less sustainable in terms of production, packaging, and transportation (Piscopo, 2015). Traditional diets have been gradually replaced by processed and fast foods, leading to various health issues, including obesity, diabetes, and cardiovascular diseases (Weerasekara et al., 2018). As a rapidly developing country, Malaysia faces challenges concerning SFC. Malaysia, known for its rich cultural diversity and culinary heritage, has witnessed significant changes in dietary patterns over the past few decades (Moy & Zulkefli, 2023).

Food waste emerges as a pressing issue in Malaysia, exacerbated by both consumer and producer behaviors (Mohd Som, 2023; Abas, 2023). According to the Solid Waste Corporation Malaysia (2019), Malaysians waste 16,688 tonnes of food daily. This substantial amount of food wastage underscores the potential to alleviate hunger and reduce food insecurity by redirecting surplus food to those in need. Concurrently, unsustainable farming practices, such as using pesticides and fertilizers, contribute to environmental degradation and health risks for farmers and consumers. These practices can lead to soil degradation, water pollution, and health problems for farmers and consumers. Concurrently, the country grapples with food security concerns and environmental degradation resulting from unsustainable agricultural practices (Ramli et al., 2023).

SFC is essential to environmental protection and human health. However, there are several issues and problems related to SFC

in Malaysia. One of the significant issues is the high consumption of fast food, especially among youth in Malaysia. Studies have shown that young adults in Malaysia tend to consume more fast food than fruits and vegetables (Abdullah et al., 2015; Phang et al., 2020). This is a major issue as fast food is often high in calories, fat, and sugar, which can lead to health problems such as obesity, diabetes, and heart disease. Malaysia stands out in Southeast Asia with the highest prevalence of adult obesity. Over the past two decades, Malaysia has seen a significant rise in obesity, from 4.4 percent in 1996 to 19.7 percent in 2019 (Mohd-Sidik et al., 2021). The National Health Screening Initiative (NHSI) 2023 revealed that out of 283,100 individuals screened in Malaysia, 31.3 percent were overweight (BMI > 25 kg/m²) and 22.2 percent were obese (BMI > 30 kg/m²), totaling 53.5 percent with weight issues (Codeblue, 2023). Globally, projections suggest alarming figures, with an estimated 1 billion adults being obese and 2.7 billion overweight by 2025 (World Health Organization, 2021).

In the context of Malaysia, there exists a notable gap in the literature pertaining to SFC. While various studies have explored related concepts such as organic food and green food consumption, the specific term "sustainable food consumption" remains relatively underrepresented. Several studies, for instance, by Jaafar et al. (2023), Chekima et al. (2023), Saleki & Mohammad (2019), and Jaffery & Annuar (2022) delved into the various topics of organic food consumption in Malaysia. Khan et al. (2015), Leong & Mariadass (2019), and Ganesh et al. (2021) conducted studies related to the factors affecting the purchase intention of green food products in Malaysia. Despite these efforts, there remains a lack of comprehensive research explicitly addressing SFC practices and their determinants in Malaysia. Addressing this gap is essential to identify practical solutions and policies that facilitate a transition toward more sustainable dietary habits.

University students play a pivotal role in determining SFC patterns. At this stage of life, they are developing habits and preferences, making them more receptive to new ideas and behaviors. The authors explore the relationship between young consumers and sustainability. They identify three crucial areas: building sustainable consumption and production literacy, limiting advertising, and eliciting visions for a sustainable future. Moreover, university students tend to be more educated and environmentally aware than the general population (Szeberenyiet al., 2022; Aniket et al., 2022; Libelo et al., 2022). Empowering young people with knowledge and encouraging conscious consumer choices can significantly contribute to achieving a sustainable consumption future.

However, despite their potential for positive impact, young consumers often exhibit unsustainable dietary habits. These habits include high meat consumption and food waste generation (Bernardo et al., 2017). Economic disparities among university students further complicate SFC (Elizabeth et al., 2023). Students from lower-income backgrounds may struggle to afford sustainably sourced foods or engage in ethical food choices due to limited financial resources (Koh & Lee, 2019). Moreover, sustainability education is deficient among university students (Alsaati et al., 2021). Many consumers remain unaware of the environmental impact of their food choices, lacking the knowledge needed to make informed decisions regarding sustainable diets (Morren et al., 2021; Hartmann et al., 2021). Therefore, studying SFC among university students in Malaysia provides valuable insights into the factors influencing SFC and can drive targeted efforts to promote sustainable practices within this demographic.

SFC is not only crucial for environmental protection but also impacts human health. However, challenges persist in Malaysia, including high fast-food consumption, lack

of awareness, food waste, and unsustainable farming practices. Understanding young consumer's perspectives on environmentally responsible behavior is vital, as they represent the future of society. Young consumers exhibit forward-looking behavior, considering both immediate and long-term consequences of their actions, particularly in their preference for eco-friendly products.

They rely on digital platforms and social media for information before making purchasing decisions. While SFC intention among young Malaysian consumers has received limited attention, further exploration is necessary. This study aims to investigate the impact of environmental attitude and environmental concern on SFC intention among young consumers in Malaysia and examine the mediating role of environmental attitude.

LITERATURE REVIEW

Sustainable food consumption intention

Sustainable food consumption (SFC) refers to the act of consuming food that "responds to fundamental requirements and increases the quality of life while reducing the use of natural resources, harmful materials, waste, and pollution emissions throughout the life cycle so as not to jeopardize the needs of future generations" (Roundtable, 1994). Sustainable food practices have become essential strategies for fostering resilience, equity, and environmental stewardship within food systems. These practices, including home gardening (Mansor, 2024), buying locally (Cappelli et al., 2022), eating seasonally (Régner et al., 2022), reducing food waste (Nordin et al., 2024), and using sustainable packaging (Otto et al., 2021), offer tangible ways to promote sustainability and mitigate the adverse impacts of conventional food production and consumption practices.

In promoting SFC, consumers increasingly opt for various practices, such as elevating the intake of plant-based foods (Daniel et al., 2023) while reducing their meat consumption (Hoek et al., 2004) and favoring seasonal products (Tekinbaş Özkaya et al., 2021). Some consumers prioritize purchasing locally sourced and/or organically produced food (Basha & Lal (2019) as potential strategies for enhancing environmental sustainability, although the effectiveness of these practices varies across different contexts. The ecological sustainability of private food consumption is contingent upon numerous variables within the diverse domain of dietary practices. These factors encompass elements such as dietary composition, production methods (e.g., organic versus conventional), and transportation logistics of food products. Contemporary studies advocate for specific measures that affluent consumers can adopt to enhance the sustainability of their dietary behaviors. These measures encompass reducing meat intake, especially beef, opting for organic food alternatives over conventionally produced ones, and refraining from purchasing products transported by air freight (Weibel et al., 2019; Pais et al., 2023). Recent research by Edenbrandt et al. (2021) emphasizes the importance of considering environmental labels and certifications when making food purchasing decisions. Moreover, findings from a study by Pais et al. (2023) underline the significance of dietary shifts toward plant-based foods in promoting environmental sustainability.

Environmental attitude

Environmental attitude significantly influences consumers' intentions and behaviors regarding SFC. Termed as "a learned predisposition to respond in a consistently favorable or unfavorable manner concerning a given object" (Fishbein & Ajzen, 1975), environmental attitude reflects individuals' feelings towards products, affecting their acceptance or rejection. Based on Ajzen's

(1991) conceptualization, attitude toward behavior refers to an individual's favorable or unfavorable evaluation of the behavior under consideration, as demonstrated by consumers. This attitude encompasses both general and specific perceptions related to purchasing decisions. General attitudes refer to overall predispositions toward appropriate behaviors within a category, while specific attitudes are particularly influential in predicting behaviors toward individual objects (Tan & Lau, 2011). Customers' beliefs and emotions towards purchasing sustainable food products often constitute specific attitudes. Consequently, customers with more favorable attitudes are more likely to purchase sustainable food products, especially when they perceive a high level of involvement in the decision-making process (Thøgersen et al., 2016; Woo & Kim, 2019).

Environmental attitudes, as described by Ogiemwonyi and Jan (2023), involve individuals' evaluations of values related to environmental protection, representing their personal recognition of the significance of environmental preservation. Recent research by Bazhan et al. (2024) found a significant influence of environmental attitude and environmental concern on behavioral intention to purchase organic food in Tehran. Bernabéu et al. (2022) highlighted that consumers displaying concern for the environment are more likely to develop positive attitudes towards purchasing sustainable food products at premium prices. Prior research has consistently shown that environmental attitudes significantly impact the purchase intentions of organic food. Cheah & Aigbogun (2022) and green items (Sethi, 2018). Based on the cumulative evidence, this study proposes the following hypothesis:

H1a: Environmental attitude significantly influences youth consumers' SFC intention.

Environmental concern

Environmental concern is cultivated through individuals' acknowledgment of their interconnectedness with the natural environment (Nabilla, 2019). This recognition instills a sense of duty toward preserving ecological integrity and promoting sustainable behaviors. The concept of environmental concern reflects consumers' general attitude towards safeguarding the environment (Fransson & Gärling, 1999). As a result, environmentally concerned individuals advocate for proactive approaches to mitigate environmental degradation and uphold the well-being of ecosystems. A plethora of studies has highlighted environmental concern as an essential predictor of ecologically friendly behavior in pro-environmental literature. Taufique & Vaithianathan (2018) revealed a significant positive impact of environmental concern on ecologically conscious consumer behavior (ECCB) among young urban consumers in India. Meanwhile, findings by Hoang Yen & Hoang (2023) discovered that environmental concerns play a crucial role in influencing customers' engagement with green consumption in Vietnam.

Esmailpour & Bahmiary (2017) established a positive relationship between environmental concerns and intentions to purchase green products in Iran. Their findings indicate that consumers who are environmentally concerned are less likely to choose products that have a low environmental impact or are more destructive to the environment. Essentially, consumers who prioritize environmental considerations tend to avoid products that contribute to environmental harm or have a negative ecological footprint. Recent study by Maduku (2024) among South African consumers have reinforced these conclusions, highlighting the substantial influence of environmental concerns on sustainable consumption patterns. As consumers prioritize environmental considerations, they anticipate experiencing

positive emotions when actively engaging in sustainable consumption behaviors, contrasting with negative emotions that arise when they fail to adhere to such practices.

Moslehpour et al. (2023) found a positive association between environmental concern and green purchase intention in Taiwan and Mongolia. Environmental challenges arising from business practices in Taiwan and Mongolia prompt consumers in these regions to develop a heightened consciousness regarding these environmental issues, their underlying causes, and the ensuing consequences. This awareness contributes to the cultivation of green purchasing intentions among consumers as they seek to address environmental concerns within their respective contexts proactively. Thus, the body of research suggests that environmental concern plays a pivotal role in supporting intentions to purchase environmentally friendly products. Therefore, this study proposes the following hypothesis:

H1b: Environmental concerns significantly influence youth consumers' SFC intention.

The mediating role of environmental attitude

There has been limited research specifically examining environmental attitudes as a mediator in the relationship between environmental concern and SFC intentions, particularly within the context of Malaysia. Environmental concern initiates the development of pro-environmental attitudes among individuals, thereby positively influencing their inclination towards green purchase behavior (Esmaeilpour & Bahmiary, 2017; Jaiswal & Kant, 2018). This association is characterized by the intermediary function of environmental attitude, wherein heightened environmental concern cultivates a mindset emphasizing ecological values and sustainability. As awareness of environmental issues and their implications grows, individuals are more inclined to adopt attitudes aligned

with environmentally responsible practices (Sharma et. al., 2022). These pro-environmental attitudes serve as intermediaries linking environmental concerns to actual purchasing decisions, guiding consumers toward favoring environmentally friendly products and services (Kautish & Sharma, 2019). Consequently, environmental attitude plays a crucial role in translating individuals' environmental concerns into actionable behaviors that contribute to sustainable consumption patterns, including green purchasing behavior.

Environmental attitude serves as an intermediary factor that influences how environmental concern translates into actual behaviors. Ojedokun & Balogun (2010) investigated the mediating role of environmental attitude in the context of responsible environmental behavior among respondents in Nigeria. Their research emphasizes that environmental attitude significantly mediates between self-concept, environmental self-efficacy, and responsible environmental behavior. Onurlubaş (2018) conducted a study among consumers in Turkey, observing a significant mediating effect of environmental attitude on the relationship between environmental concern and the intention to purchase green products. Shen et al. (2024) examined hospital workers in China and discovered that pro-environmental attitudes mediated the relationship between climate change health risk (CHRP) and pro-environmental behavior.

Liu et al. (2020) conducted their research among consumers in China, demonstrating a significant mediating effect of environmental attitude in the relationship between environmental knowledge and environmental behavior intention. Furthermore, Domínguez-Valerio et al. (2019) discovered that the attitude towards sustainable development acts as a mediator between knowledge of sustainable development and behavior towards sustainability. This implies that despite students possessing considerable

knowledge about sustainable development and displaying behaviors that align with sustainability, it is imperative to enhance their attitudes toward sustainable development. Such enhancements can have enduring impacts on their final behaviors over the long term. Given the insights from earlier research, this study hypothesizes that:

H2: Environmental attitude mediates the relationship between environmental concern and SFC intention

RESEARCH METHODOLOGY

Research framework

Figure 1 depicts the research framework adopted for this study, aiming to explore the influence of environmental attitude and environmental concern on sustainable food consumption intention (SFCI) among Malaysian undergraduate students. The framework places particular emphasis on examining the mediating role of environmental attitude in this relationship.

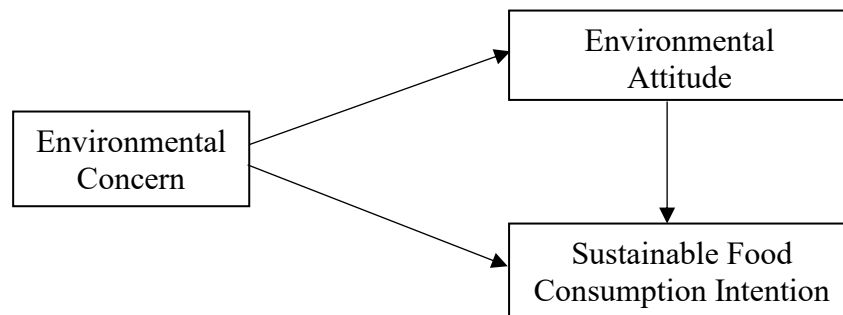


Figure 1 Research framework

Population and sample size

In this study, the population under investigation comprises students enrolled at public universities in Malaysia. According to data from the Ministry of Higher Education Malaysia (2022), the total population of university students in Malaysia stands at approximately 384,706. The target population for this study was public university students in Malaysia who were enrolled in an undergraduate degree during the 2021-2022 academic year. Convenience sampling was employed to select participants, facilitating ease of access and data collection from the target population within the constraints of time and resources.

The inclusive criteria for respondents in this study encompass two key requirements. Firstly, respondents must be undergraduate university students, with a particular emphasis

on those pursuing diplomas and bachelor's degrees. Secondly, respondents must be enrolled in a public university in Malaysia. Referring to the methodology proposed by Krejcie and Morgan (1970), the sample size can be determined relative to the population size. Given the estimated population of approximately 384,706 university students in Malaysia, a sample size of 384 respondents is deemed appropriate for this study.

Research instrument

The questionnaire items utilized in this study were adapted from previous research studies conducted by Roberts (1996), Smith et al. (1994), Tanner & Kast (2003), and Nguyen et al. (2021). The decision to incorporate these items into the questionnaire was based on their validation in prior research, thereby enhancing the reliability of the instrument. Ethical approval for data collection was obtained from

the Universiti Putra Research (UPM) ethics committee prior to commencement. Each statement in the questionnaire was assessed using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This standardized scale facilitated the systematic measurement of participants' responses, ensuring consistency and comparability across survey items.

Data collection

This research employed a survey questionnaire comprising multiple sections to gather data. Given the wide geographic distribution of participants across various universities in Malaysia, questionnaire forms or links were disseminated through online media platforms such as WhatsApp, Facebook, Instagram, and email. The data collection process was commenced from October to December 2022, allowing sufficient time to collect responses from participants. Furthermore, utilizing an online survey method offers advantages such as increased efficiency, cost-effectiveness, and the ability to reach a diverse participant pool across different regions of Malaysia.

RESULTS

Demographic profiles

The demographic profiles of participants in the study exhibit a varied composition across several key parameters. In terms of gender distribution, the sample encompasses 250 females, representing 69.3% of the total respondents, and 111 males, constituting 30.7% of the sample population. Regarding age demographics, a predominant proportion of respondents, comprising 327 individuals (90.6%), fall within the 18-24 age category, while a smaller contingent of 32 individuals (8.9%) belong to the 25-34 age bracket, and only 2 individuals (.6%) are aged between 35 and 44. Ethnically, the sample displays diversity, with the majority identifying as Malay, comprising 176 individuals (48.8%). Chinese respondents constitute the second-

largest group, comprising 84 individuals (23.3%), followed by Bumiputra Sarawak (62 individuals, 17.2%), Bumiputra Sabah (20 individuals, 5.5%), and Indian (19 individuals, 5.3%).

In terms of religious affiliation, the majority of participants identify as Muslim, with 214 individuals (59.3%) professing this faith. Other religious affiliations include Buddhist (73 individuals, 20.2%), Christian (52 individuals, 14.4%), Hindu (17 individuals, 4.7%), and a small minority identifying as non-religious (5 individuals, 1.4%). In relation to household income, the majority of respondents (268 individuals, 74.2%) report an income below RM4360, while 67 respondents (18.6%) fall within the RM4360 – RM9619 income bracket, and a smaller cohort (26 individuals, 7.2%) report earning more than RM9619. Lastly, regarding educational attainment, the data indicates that the majority of respondents hold a bachelor's degree (312 individuals, 86.4%), while a smaller proportion possess a diploma qualification (49 individuals, 13.6%).

Top of Form

Confirmatory factor analysis

Test of model fit for measurement model

Table 1 provides a comprehensive review of these goodness-of-fit indices in regard to each variable inside the measurement model. The results show that the RMSEA produced a value of 0.068, which is below the acceptable threshold of 0.08 (Browne & Cudeck, 1993). In addition, the CFI established a robust fit at 0.956, exceeding the proposed level of 0.90 (Bentler, 1990), while the TLI was likewise beyond the recommended threshold at 0.949 (Bollen, 1990). The relative Chi-Square value amounted to 2.989, which comfortably met the criterion of staying below 3.0 (Marsh & Hocevar, 1985). To sum up, the combination of these four indices verifies the adequacy of the measurement model for the data set, indicating its strong fit.

Table 1 Result of goodness of fit for pooled CFA measurement model

Name of Index	Recommended Value	Result
RMSEA	RMSEA < 0.08	0.076
CFI	CFI > 0.90	0.919
GFI	GFI > 0.90	0.907
Relative Chi-Square	Chi-Sq/df < 3.0	2.684

Table 2 summarizes the standardized factor loadings for each item in its respective variables, average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha in the measurement model. The factor loadings for all items in the model were statistically significant, and their standardized factor loading estimates were above the recommended value of 0.60. Apart from that, the values of AVE for all variables were greater than 0.50. Overall, the values of AVE ranged from 0.579 to 0.582, which suggests that the variables had passed the convergent validity requirement. With reference to composite reliability (CR), all of the variables demonstrated a value greater than 0.70, ranging from 0.822 to 0.845, indicating good reliability of the variables. The Cronbach's alpha coefficients for each variable exceeded the threshold of 0.70, indicating a satisfactory level of internal consistency. Specifically, Cronbach's alpha coefficients for the ten factors ranged from 0.813 to 0.840, affirming a notably high level of internal consistency within the measurement instrument.

Table 2 Summary results of CFA for the measurement model

Item	Factor Loading	CR	AVE
Environmental Attitude		0.822	0.582
EA1	0.617		
EA3	0.624		
EA4	0.713		
EA5	0.795		
EA6	0.706		
Environmental Concern		0.838	0.508
EC1	0.695		
EC2	0.731		
EC3	0.696		
EC4	0.756		
EC6	0.683		
Sustainable Food Consumption Intention		0.845	0.579
SFCI1	0.789		
SFCI2	0.791		
SFCI4	0.778		
SFCI5	0.679		

Model fit for structural model

Figure 2 depicts the structural models and summarizes the relationships and interactions between the latent constructs in the study. It visually represents the pathways through which environmental attitude and environmental concern influence SFC intention. The model fit indicators for the full structural model supported a good model fit, Chi-Sq/df = 2.684, CFI = 0.919, GFI = 0.907, and RMSEA = 0.076.

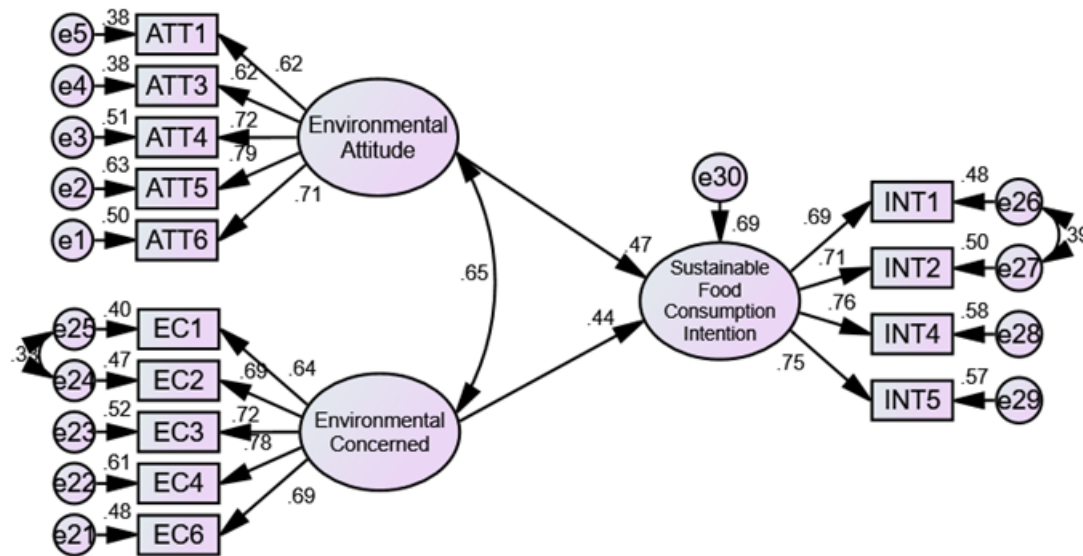


Figure 2 Structural model

Determinants of SFC intention

Table 3 summarizes the hypothesis testing results for factors influencing the SFC intention of young consumers in Malaysia. The results strongly support H1a ($\beta = 0.468, p < 0.001$) indicating that environmental attitude significantly influences SFC intention. In a similar vein, the findings also support H1b ($\beta = 0.444, p < 0.001$), in which environmental concerns significantly influences SFC intention.

Table 3 Result of hypothesis testing

Hypotheses Statements		β	S.E.	C.R.	p	Results
H1a	Environmental attitude significantly influences youth consumers' SFC intention.	0.468	0.087	6.059	***	Supported
H1b	Environmental concern significantly influences youth consumers' SFC intention.	0.444	0.083	5.770	***	Supported
Note:	β :	Standard Beta Coefficient				
	S.E. :	Standard Error				
	C.R. :	Critical Ratio				
	*** :	Significant at level 0.001				

Mediation analysis

Validating the mediation effect within the structural model

Within the AMOS graphic software, mediation analysis was conducted through the creation of three distinct models: the Full Mediation Model, the Indirect Model, and the Direct Model. The initial step involved confirming the presence of a mediation effect within the overall structural model. During this stage, the Full Mediation and Indirect Models were compared. It is evident that the Full Mediation Model meets two out of the three established criteria, positioning it as a preferable model. Specifically, the CMIN (sig- χ^2) value of 983.461 for the Full Mediation Model is lower than the corresponding value of 1047.877 for the Indirect Model.

Similarly, the AIC value of 1131.461 for the Full Mediation Model is lower than the AIC value of 1187.877 for the Indirect Model. However, it is important to note that the PNFI value of 0.737 for the Full Mediation Model is slightly higher than the 0.735 observed for the Indirect Model, indicating a marginal advantage for the latter. Despite this, the Full Mediation Model satisfies all three primary criteria, establishing its superiority over the Indirect Model. Consequently, the presence of a mediation effect within the model is confirmed.

Determining the mediation effect for individual path

The second procedure was to check for the effect of the mediating variable for an individual path in the structural model. Table 4 provides a summary of the mediation study results, comprising the standardized beta coefficient (β), critical ratio (C.R.), and p-values for both the Direct Model and Full Mediation Model across each relevant path.

Table 4 Results of mediation effects of environmental attitude

Hypothesized Paths	β	C.R.	P-Value	Results
Environmental Concern				
Direct Model				
SFCI \leftarrow EC	0.463	3.815	***	Significant
Full Mediation Model				
ATT \leftarrow EC	0.673	2.242	0.025	Significant
SFCI \leftarrow ATT	0.404	3.209	0.001	Significant
SFCI \leftarrow EC	0.423	3.328	***	Significant

Note: β : Standardized Coefficient C.R. : Critical Ratio
 *** : Significant at 0.001 level

Following the decision criteria established by Hair et al. (2010), the study reveals that environmental attitude serves as a mediator between environmental concern and SCFI. Table 5 provides a brief overview of the findings concerning hypothesis testing in the mediation analysis.

Table 5 Summary results for hypothesis testing of mediation analysis

Hypothesis	Hypothesis Statement	Results	Types of Mediation
H2	Environmental attitude mediates the relationship between environmental concern and SFC intention.	Supported	Partial mediation

Figure 3 visually presents the standardized beta coefficients derived from structural equation modeling, offering a detailed insight into the model. As depicted, all exogenous variables in the model exert statistically significant impacts on their respective endogenous variables. The model estimates that environmental concern accounts for 45% of the variance in environmental attitude ($R^2 = 0.45$). Conversely, environmental concern and environmental attitude jointly explain 59% of the variance in SFCI ($R^2 = 0.59$).

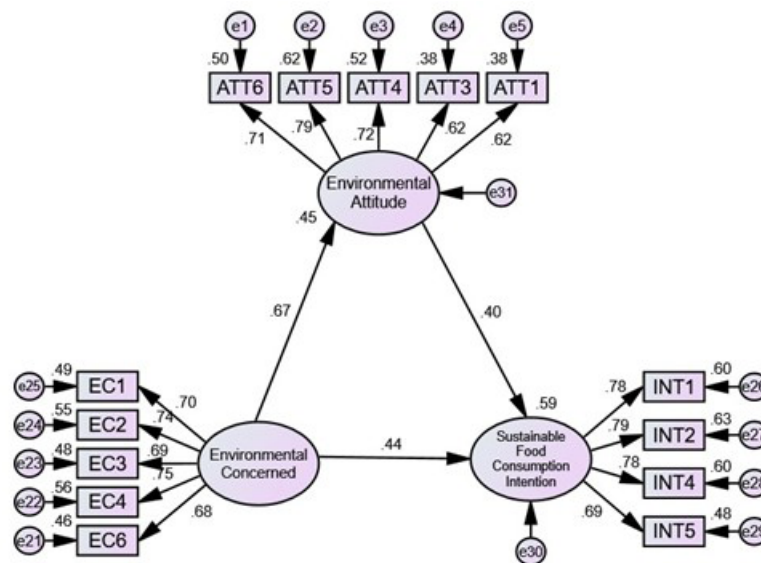


Figure 3 Full mediation model

DISCUSSION

The findings of this study indicate that environmental attitude and environmental concern both exert significant positive influences on the sustainable food consumption intention (SFCI) of young consumers in Malaysia, thus supporting hypotheses H1a and H1b, respectively. The significance of these findings lies in their implications for sustainable consumption behavior among the younger demographic in Malaysia. The positive influence of environmental attitude suggests that young consumers who possess a favorable attitude toward environmental issues are more likely to exhibit intentions to engage in SFC practices. This aligns with existing literature (Bazhan et al., 2024; Bernab   et al., 2022; Th  gersen et al., 2016; Cheah & Aigbogun, 2022; Sethi, 2018) emphasizing the role of environmental attitude in environmentally conscious behaviors.

Similarly, the significant positive influence of environmental concern on SFCI highlights the pivotal role of concern for the environment in driving sustainable consumption behaviors among young consumers. This finding is in line with previous studies such as those by Taufique & Vaithianathan (2018), Hoang Yen

& Hoang (2023), Esmaeilpour & Bahmiary (2017), Maduku (2024), and Moslehpour et al. (2023), which have also demonstrated the strong association between environmental concern and SFCI. This finding underscores the importance of raising awareness and fostering a sense of responsibility toward environmental conservation among the youth population.

The findings of the study also support hypothesis H2, which posits that environmental attitude serves as a mediator in the relationship between environmental concern and SFCI. The results indicate a significant relationship between environmental concern and SFCI, with environmental attitude partially mediating this relationship. It also implies that environmental concern has a direct effect on SFCI, in addition to its indirect influence through environmental attitude. The result suggests that individuals who possess a stronger environmental concern are more likely to exhibit favorable attitudes towards the environment, which in turn influences their intention to engage in SFC practices. The findings of this study are consistent with several previous literature that have also identified the mediating role of environmental attitude in the relationship between environmental concern and pro-environmental behaviors

(Kautish & Sharma, 2019; Ojedokun & Balogun, 2010; Onurlubaş, 2018; Shen et al., 2024; Liu et al., 2020; Domínguez-Valerio et al., 2019).

CONCLUSION

In conclusion, the study investigated the roles of environmental attitude and environmental concern in influencing SFC among youth consumers in Malaysia. The results highlight the significance of these factors in influencing SFC behaviors, indicating a need for targeted interventions to foster positive environmental attitudes and raise awareness about environmental concerns among youth consumers. Understanding these determinants is essential not only for promoting the health and well-being of young consumers but also for addressing broader issues such as food security and environmental sustainability in Malaysia.

The implications of the study's results extend to academia, policymakers, and industry stakeholders, each with unique roles to play in fostering SFC among youth in Malaysia. For academia, the findings emphasize the importance of integrating environmental education and awareness campaigns into university curricula. Academic institutions can develop interdisciplinary courses that explore the connections between food systems, environmental sustainability, and consumer behavior. Additionally, research initiatives focusing on understanding the socio-cultural, economic, and environmental factors influencing SFC among youth can provide valuable insights for future policymaking and industry practices.

Policymakers can leverage the study's findings to inform the development of evidence-based policies and initiatives aimed at promoting SFC among youth. This may include implementing regulations to incentivize sustainable food production and consumption practices, such as subsidies for organic farming or tax incentives for businesses offering sustainable food options.

Policymakers can also invest in educational programs and public awareness campaigns to raise awareness about the environmental and health benefits of SFC and provide resources to support sustainable food initiatives at the community level. Industry stakeholders, including food producers, retailers, and restaurants, can play a crucial role in promoting SFC among youth by offering sustainable food options and adopting environmentally friendly practices throughout the supply chain. This involves sourcing locally grown, organic produce, reducing food waste through innovative packaging and distribution methods, and providing transparent information about the environmental impact of products. Collaborating with academic institutions and government agencies to develop and implement sustainability certifications and labeling schemes can also help consumers make informed choices about their food purchases.

In addition to broader initiatives, specific actions to foster SFC among youth include partnering with educational institutions for awareness campaigns, establishing community gardens, implementing sustainable food procurement policies on campuses, collaborating with food retailers for waste reduction programs, and supporting young entrepreneurs in sustainable food ventures. By working together across academia, policy, and industry sectors, stakeholders can create a supportive environment that empowers youth to make sustainable food choices and contribute to a healthier, more resilient food system for future generations.

REFERENCES

- Abas, A. (2023). *The global champion of food waste*. The Malaysian Reserve, April 10, 2023. Retrieved from <https://themalaysianreserve.com/2023/04/10/the-global-champion-of-food-waste/>.
- Abdullah, N. N., Mokhtar, M. M., Bakar, M. H., & Al-Kubaisy, W. (2015). Trend on fast food consumption in relation to obesity among Selangor urban community. *Procedia – Social and Behavioral Sciences*, 202, 505 – 513. <https://doi.org/10.1016/j.sbspro.2015.08.189>.

- Aniket, Verma., Vishal, Kumar, Verma. (2022). Environmental awareness among students. *International Journal for Science Technology and Engineering*, 10(4):945-948. <https://doi.org/10.22214/ijraset.2022.41306>.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).
- Alsaati, T., El-Nakla, S., & El-Nakla, D. (2020). Level of sustainability awareness among university students in the eastern province of Saudi Arabia. *Sustainability*, 12(8), 3159. <https://doi.org/10.3390/su12083159>.
- Ammann, J., Arbenz, A., Mack, G., Nemecek, T., & El Benni, N. (2023). A review on policy instruments for sustainable food consumption. *Sustainable Production and Consumption*, 36, 338-353. <https://doi.org/10.1016/j.spc.2023.01.012>.
- Azman, A. B., Mazlan, N., Abd Ghani, F., Ramli, N., & Yusoff, N. M. (2023). Consumer behaviour: Ready-to-eat food in peninsular Malaysia based on food-related lifestyle. *Journal of Islamic*, 8(53), 15-24. <https://doi.org/10.55573/JISED.085302>.
- Basha, M.B., Lal, D. 2019. Indian consumers' attitudes towards purchasing organically produced foods: An empirical study. *Journal of Cleaner Production*, 215, 99-111. <https://doi.org/10.1016/j.jclepro.2018.12.098>.
- Bazhan, M., Shafiei Sabet, F., & Borumandnia, N. (2024). Factors affecting purchase intention of organic food products: Evidence from a developing nation context. *Food Science & Nutrition*. <https://doi.org/10.1002/fsn3.4015>.
- Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238-246. DOI: <https://doi.org/10.1037/0033-2909.107.2.238>.
- Bernabéu, R., Nieto, R., & Rabadán, A. (2022). Effect of self-reported attitudes toward organic foods in consumer preferences and willingness to pay. *Renewable Agriculture and Food Systems*, 37(4), 360-368 <https://doi.org/10.1017/S1742170522000035>.
- Bernardo, G. L., Jomori, M. M., Fernandes, A. C., & Proença, R. P. D. C. (2017). Food intake of university students. *Revista de Nutrição*, 30, 847-865. <https://doi.org/10.1590/1678-98652017000600016>.
- Bollen, K. A. (1990). Overall fit in covariance structure models: Two types of sample size effects. *Psychological Bulletin*, 107(2), 256-259. <https://doi.org/10.1037/0033-2909.107.2.256>.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen and J. S. Long (Eds.), *Testing Structural Equation Models*, 136-162. Sage.
- Cappelli, L., D'Ascenzo, F., Ruggieri, R., & Gorelova, I. (2022). Is buying local food a sustainable practice? A scoping review of consumers' preference for local food. *Sustainability*, 14(2), 772. <https://doi.org/10.3390/su14020772>.
- Cheah, W. K. A., & Aigbogun, O. (2022). Exploring attitude-behaviour inconsistencies in organic food consumption during the COVID-19 pandemic in the Klang Valley, Malaysia. *Cleaner and Responsible Consumption*, 7, 100077. <https://doi.org/10.1016/j.clrc.2022.100077>.
- Chekima, B., Bouteraa, M., Ansar, R., Lada, S., Fook, L. M., Tamma, E., ... & Chekima, K. (2023). Determinants of organic food consumption in narrowing the green gap. *Sustainability*, 15(11), 8554. <https://doi.org/10.3390/su15118554>.
- Chu, K. M. (2018). Mediating influences of attitude on internal and external factors influencing consumers' intention to purchase organic foods in China. *Sustainability*, 10(12), 4690. <https://doi.org/10.3390/su10124690>.
- CodeBlue. (2023). *NHSI 2023: Over 53% of Screened Malaysians Overweight or Obese*. Retrieved from <https://codeblue.galencentre.org/2023/12/25/nhsi-2023-over-53-of-screened-malaysians-overweight-or-obese/#:~:text=The%20National%20Health%20Screening%20Initiative,17.1%25%20with%20high%20glucose%20levels>.
- Daniel, Francisco, Bento, Pais., António, Cardoso, Marques., José, Alberto, Fuinhas. (2023). How to promote healthier and more sustainable food choices: The case of Portugal. *Sustainability*, 15(4): 3868-3868. <https://doi.org/10.3390/su15043868>.
- Dominguez-Valerio, C. M., Moral-Cuadra, S., Medina-Viruel, M. J., & Orgaz-Agüera, F. (2019). Attitude as a mediator between sustainable behaviour and sustainable knowledge: An approximation through a case study in the Dominican Republic. *Social Sciences*, 8(10), 288. <https://doi.org/10.3390/socsci8100288>.
- Edenbrandt, A. K., & Lagerkvist, C. J. (2021). Is food labelling effective in reducing climate impact by encouraging the substitution of protein sources? *Food Policy*, 101, 102097. <https://doi.org/10.1016/j.foodpol.2021.102097>.
- Elizabeth, Aleru., Ifeoluwa, Omolara, Bodunde., Oluwadamilola, Gbenro. (2023). Drivers of food choice, meal pattern, and lifestyle habits among undergraduate students in Lead City University, Ibadan, Oyo State, Nigeria. *World Nutrition*, 14(2):66-78. <https://doi.org/10.26596/wn.202314266-78>.
- Esmailpour, M., & Bahmi, E. (2017). Investigating the impact of environmental attitude on the decision to purchase a green product with the mediating role of environmental concern and care for green products. *Management & Marketing*, 12(2), 297-315. <https://doi.org/10.1515/mmcks-2017-0018>.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Fransson, N., & Gärling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology*, 19(4), 369-382. <https://doi.org/10.1006/jevp.1999.0141>.

- Ganesh, A.P., Mohamed@Naba, M., Ali, A., & Jaafar, S.N. (2021). Consumers' knowledge, attitude, consumption, and purchase intention towards green foods in selected area in Selangor. *International Journal of Academic Research in Business and Social Sciences*. <https://doi.org/10.6007/ijarbss%2Fv11-i16%2F11221>.
- Hair, J.F., Anderson, R.E., Babin, B.J., & Black, W.C. (2010). *Multivariate Data Analysis*. 7th Ed. New Jersey: Prentice-Hall Inc.
- Hartmann, C., Lazzarini, G., Funk, A., & Siegrist, M. (2021). Measuring consumers' knowledge of the environmental impact of foods. *Appetite*, 167, 105622. <https://doi.org/10.1016/j.appet.2021.105622>.
- Herrero, M., Hugas, M., Lele, U., Wirakartakusumah, A., Torero, M. (2023). A shift to healthy and sustainable consumption patterns. In: von Braun, J., Afsana, K., Fresco, L.O., Hassan, M.H.A. (eds) *Science and Innovations for Food Systems Transformation*. Springer, Cham. https://doi.org/10.1007/978-3-031-15703-5_5.
- Hoang Yen, N. T., & Hoang, D. P. (2023). The formation of attitudes and intention towards green purchase: An analysis of internal and external mechanisms. *Cogent Business & Management*, 10(1). <https://doi.org/10.1080/23311975.2023.2192844>.
- Hoek, A. C., Malekpour, S., Raven, R., Court, E., & Byrne, E. (2021). Towards environmentally sustainable food systems: decision-making factors in sustainable food production and consumption. *Sustainable Production and Consumption*, 26, 610-626. <https://doi.org/10.1016/j.spc.2020.12.009>.
- Jaafar, N. A. A., Sulaiman, N., Sabran, M. R., & Badari, S. A. Z. (2023). Development, validity and reliability of a questionnaire on psychological factors of organic food consumption among Malaysian adults. *Information Management and Business Review*, 15(2 (I) SI), 57-69. [https://doi.org/10.22610/imbr.v15i2\(I\)SI.3417](https://doi.org/10.22610/imbr.v15i2(I)SI.3417).
- Jaffery, N. S. N., & Annuar, S. N. S. (2022, December). Malaysia consumers green purchasing behaviour towards organic products: A review. In *International Conference on Communication, Language, Education and Social Sciences (CLESS 2022)* (pp. 205-212). Atlantis Press. https://doi.org/10.2991/978-2-494069-61-9_20.
- Jaiswal, D., & Kant, R. (2018). Green purchasing behaviour: A conceptual framework and empirical investigation of Indian consumers. *Journal of Retailing and Consumer Services*, 41, 60-69. <https://doi.org/10.1016/j.jretconser.2017.11.008>.
- Kautish, P., and Sharma, R. (2019). Value orientation, green attitude and green behavioral intentions: an empirical investigation among young consumers. *Young Consumers*. 20 (4), 338-358. <https://doi.org/10.1108/YC-11-2018-0881>.
- Khan, M. R. T., Chamhuri, S., & Farah, H. S. (2015). Green food consumption in Malaysia: a review of consumers' buying motives. *International Food Research Journal*, 22(1), 131. [http://www.ifrj.upm.edu.my/22%20\(01\)%202015/\(20\).pdf](http://www.ifrj.upm.edu.my/22%20(01)%202015/(20).pdf).
- Krejcie, R.V. and Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610. <https://doi.org/10.1177/001316447003000308>.
- Leong, T. P., & Mariadass, A. M. (2019). Factors affecting young adults' purchase intention of green food products in Malaysia. *Journal of Tourism, Hospitality and Culinary Arts*, 11(2), 20-45. https://fhtm.uitm.edu.my/images/jthca/Vol11Issue2/Chap_2.pdf.
- Libelo, H., & Tracy, S. (2022). Establishing a relationship between demographic factors and students' environmental awareness. *Journal of Student Research*, 11(1). <https://doi.org/10.47611/jsrhs.v11i1.2282>.
- Liu, P., Teng, M., & Han, C. (2020). How does environmental knowledge translate into pro-environmental behaviors?: The mediating role of environmental attitudes and behavioral intentions. *Science of the Total Environment*, 728, 138126. <https://doi.org/10.1016/j.scitotenv.2020.138126>.
- Maduku, D. K. (2024). How environmental concerns influence consumers' anticipated emotions towards sustainable consumption: The moderating role of regulatory focus. *Journal of Retailing and Consumer Services*, 76, 103593. <https://doi.org/10.1016/j.jretconser.2023.103593>.
- Mansor, N. A. (2024). Home Gardening: Enabling Grassroots Efforts in an Urban Socialist Society, Penang. http://myscholar.umk.edu.my/bitstream/123456789/6123/1/Home-Gardening_-Enabling-Grassroots-Efforts-in-an-Urban-Socialist-Society-Penang.pdf.
- Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First- and higher order factor models and their invariance across groups. *Psychological Bulletin*, 97(3), 562-582. <https://doi.org/10.1037/0033-2909.97.3.562>.
- Ministry of Higher Education Malaysia. (2022). *Statistic of Higher Education 2022 - Public University*. Retrieved from: <https://www.mohe.gov.my/en/downloads/statistics/2022-3/1178-statistik-pendidikan-tinggi-2022-04-bab-2-makro-universiti-awam/file>.
- Mirzabaev, A., Kerr, R. B., Hasegawa, T., Pradhan, P., Wreford, A., von der Pahlen, M. C. T., & Gurney-Smith, H. (2023). Severe climate change risks to food security and nutrition. *Climate Risk Management*, 39, 100473. <https://doi.org/10.1289%2Fehp.1104424>.
- Mohd Som, Z. (2023). *Why Malaysians Need to Reduce Daily Food Waste*. The Star, July 4, 2023. Retrieved from <https://www.thestar.com.my/lifestyle/living/2023/07/04/conserving-resources-why-you-need-to-reduce-daily-food-waste>.
- Mohd-Sidik, S., Lekhranj, R., & Foo, C. N. (2021). Prevalence, associated factors and psychological determinants of obesity among adults in Selangor, Malaysia. *International Journal of Environmental Research and Public Health*, 18(3), 868. <https://doi.org/10.3390/ijerph18030868>.

- Morren, M., Mol, J. M., Blasch, J. E., & Malek, Ž. (2021). Changing diets-Testing the impact of knowledge and information nudges on sustainable dietary choices. *Journal of Environmental Psychology*, 75, 101610. <https://doi.org/10.1016/j.jenvp.2021.101610>.
- Moslehpour, M., Chau, K. Y., Du, L., Qiu, R., Lin, C. -Y., & Batbayar, B. (2023). Predictors of green purchase intention toward eco-innovation and green products: Evidence from Taiwan. *Economic Research-Ekonomska Istraživanja*, 1–22. <https://doi.org/10.1080/1331677X.2022.2121934>.
- Moy, F. M., & Zulkefli, N. F. (2023). Sustainable diet behaviour among university students in Malaysia. *Preprints*, 2023080914. <https://doi.org/10.20944/preprints202308.0914.v1>.
- Nabilla, F. (2019). Advertising attitude, green purchase intention and environmental concern: Promoting functional versus emotional appeals. *International Journal of Business and Administrative Studies*, 5(4). 5(4), <https://doi.org/10.20469/ijbas.5.10003-4>.
- Nguyen, H. V., Dang, W., Nguyen, H., Nguyen, T. N. H., Nguyen, T. M. N., Vu, T. D., & Nguyen, N. (2021). How does environmental interpretation affect psychological well-being? A study conducted in the context of COVID-19. *Sustainability*, 13(15), 8522. <https://doi.org/10.3390/su13158522>.
- Nordin, N., Nordin, N., & Nordin, N.I.A. (2021). *Sustainable Dining: Reducing Food Waste in Malaysia*. Caknawan, 3(3), April 21, 2024. Retrieved from <https://caknawan.umk.edu.my/sustainable-dining-reducing-food-waste-in-malaysia>.
- Ogiemwonyi, O., & Jan, M. T. (2023). The influence of collectivism on consumer responses to green behavior. *Business Strategy & Development*, 6(4), 542-556. <https://doi.org/10.1002/bsd2.261>.
- Ojedokun, A. O., & Balogun, S. K. (2010). Environmental attitude as a mediator of the relationship between self-concept, environmental self-efficacy and responsible environmental behaviour among residents of high density areas in Ibadan Metropolis, Nigeria. *Ethiopian Journal of Environmental Studies and Management*, 3(2). <http://dx.doi.org/10.4314/ejesm.v3i2.59834>.
- Otto, S., Strenger, M., Maier-Nöth, A., & Schmid, M. (2021). Food packaging and sustainability–Consumer perception vs. correlated scientific facts: A review. *Journal of Cleaner Production*, 298, 126733. <https://doi.org/10.1016/j.jclepro.2021.126733>.
- Owino, V., Kumwenda, C., Ekesa, B., Parker, M. E., Ewoldt, L., Roos, N., & Tome, D. (2022). The impact of climate change on food systems, diet quality, nutrition, and health outcomes: A narrative review. *Frontiers in Climate*, 4, 941842. <https://doi.org/10.3389/fclim.2022.941842>.
- Pais, D. F., Marques, A. C., & Fuinhas, J. A. (2023). How to promote healthier and more sustainable food choices: The case of Portugal. *Sustainability*, 15(4), 3868. <https://doi.org/10.3390/su15043868>.
- Phang, G., Osman, Z., & Ginajil, J. E. (2020). Determinants of young Malaysian adults' fast food purchasing intention. *Malaysian Journal of Business and Economics (MJBE)*, 7(1), 1-1. <https://doi.org/10.51200/mjbe.vi.2523>.
- Piscopo, S. (2015). Are food convenience and sustainable consumption mutually exclusive? Home economics literacy to the rescue. *Responsible Living: Concepts, Education and Future Perspectives*, 197-215. http://dx.doi.org/10.1007/978-3-319-15305-6_13.
- Ramli, I. M., Ismail, N. A., & Sidek, N. Z. M. (2023). The effects of environmental pollution on food security in Malaysia. *Social and Management Research Journal*, 20(2), 81-96. <http://dx.doi.org/10.24191/smrj.v20i2.24317>.
- Régnier, F., Dalstein, A. L., Rouballay, C., & Chauvel, L. (2022). Eating in season—A lever of sustainability? An interview study on the social perception of seasonal consumption. *Sustainability*, 14(9), 5379. <https://doi.org/10.3390/su14095379>.
- Roberts, J.A. (1996). Green consumers in the 1990s: Profile and implications for advertising. *Journal of Business Research*, 36(3), 217–231. [https://doi.org/10.1016/0148-2963\(95\)00150-6](https://doi.org/10.1016/0148-2963(95)00150-6).
- Roundtable, O. M. (1994). Oslo roundtable on sustainable production and consumption. *Ministry of the Environment: Oslo, Norway*.
- Saleki, R., Quoquab, F., & Mohammad, J. (2019). What drives Malaysian consumers' organic food purchase intention? The role of moral norm, self-identity, environmental concern and price consciousness. *Journal of Agribusiness in Developing and Emerging Economies*, 9(5), 584-603. <https://doi.org/10.1108/JADEE-02-2019-0018>.
- Sharma, N., Paço, A., & Kautish, P. (2022a). The impact of eco-innovation on green buying behaviour: The moderating effect of emotional loyalty and generation. *Management of Environmental Quality. An International Journal*, 33(4), 1026–1045. <https://doi.org/10.1108/MEQ-11-2021-0267>.
- Shen, T., Rasdi, I. B., Ezani, N. E. B., & San, O. T. (2024). The mediating role of pro-environmental attitude and intention on the translation from climate change health risk perception to pro-environmental behavior. *Scientific Reports*, 14(1), 9831. <https://doi.org/10.1038/s41598-024-60418-7>.
- Smith, S. M., Haugtvedt, C. P., & Petty, R. E. (1994). Attitudes and recycling: does the measurement of affect enhance behavioral prediction?. *Psychology & Marketing*, 11(4), 359-374. <https://richardepetty.com/wp-content/uploads/2019/01/1994-pm-smith-haugtvedt-petty.pdf>.
- Solid Waste Corporation Malaysia. (2019). Kompendum Pengurusan Sisa Pepejal Malaysia 2019. *Solid Waste Corporation Malaysia: Cyberjaya, Malaysia*.
- Szeberenyi, A., Lukacs, R., & Papp-Vary, A. (2022). Examining environmental awareness of university students. *Engineering for Rural Development*, 21, 604-611. <https://doi.org/10.22616/erdev.2022.21.tf198>.

- Tan, B. C., & Lau, T. C. (2011). Green purchase behavior: Examining the influence of green environmental attitude, perceived consumer effectiveness and specific green purchase attitude. *Australian Journal of Basic and Applied Sciences*, 5(8), 559-567. <http://ajbasweb.com/old/ajbas/2011/August-2011/559-567.pdf>.
- Tanner, C. and Kast, S.W. (2003) Promoting sustainable consumption determinants of green purchases by Swiss consumers. *Psychology and Marketing*, 20, 883-902. <http://dx.doi.org/10.1002/mar.10101>.
- Taufique, K. M. R., & Vaithianathan, S. (2018). A fresh look at understanding Green consumer behavior among young urban Indian consumers through the lens of theory of planned behavior. *Journal of Cleaner Production*, 183, 46–55. <https://doi.org/10.1016/j.jclepro.2018.02.097>.
- Tekinbaş Özkaya, F., Durak, M. G., Doğan, O., Bulut, Z. A., & Haas, R. (2021). Sustainable consumption of food: Framing the concept through Turkish expert opinions. *Sustainability*, 13(7), 3946. <https://doi.org/10.3390/su13073946>.
- Thøgersen, J., Zhou, Y., & Huang, G. (2016). How stable is the value basis for organic food consumption in China? *Journal of Cleaner Production*, 134, 214-224. <https://doi.org/10.1016/j.jclepro.2015.06.036>.
- Vermeir, I., Weijters, B., De Houwer, J., Geuens, M., Slabbinck, H., Spruyt, A., & Verbeke, W. (2020). Environmentally sustainable food consumption: A review and research agenda from a goal-directed perspective. *Frontiers in Psychology*, 11, 520238. <https://doi.org/10.3389%2Ffpsyg.2020.01603>.
- Weerasekara, P. C., Withanachchi, C. R., Ginigaddara, G. A. S., & Ploeger, A. (2018). Nutrition transition and traditional food cultural changes in Sri Lanka during colonization and post-colonization. *Foods*, 7(7), 111. <https://doi.org/10.3390%2Ffoods7070111>.
- Weibel C., Ohnmacht, T., Schaffner, D., Kossmann, K. 2019. Reducing individual meat consumption: An integrated phase model approach. *Food Quality and Preference*, 73, 8-18. <https://doi.org/10.1016/j.foodqual.2018.11.011>.
- Woo, E., & Kim, Y. G. (2019). Consumer attitudes and buying behavior for green food products: From the aspect of green perceived value (GPV). *British Food Journal*, 121(2), 320-332. <https://doi.org/10.1108/BFJ-01-2018-0027>.
- World Health Organization. (2021). *Fact Sheet: Obesity and Overweight*. WHO; Geneva, Switzerland: 2021. Available online: <http://www.who.int/mediacentre/factsheets/fs311/en/>.

THE DYNAMICS BETWEEN MACROECONOMIC INDICATORS TOWARDS ECONOMIC GROWTH AMONG ASEAN-5 COUNTRIES USING PANEL ANALYSIS

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ABSTRACT

This study aims to identify the most appropriate model for conducting panel data analysis on the macroeconomic indicators towards the economic growth in ASEAN-5 countries. The research focuses on five countries: Malaysia, Singapore, Thailand, Philippines, and Indonesia, covering the period from 1980 to 2019. The independent variables under investigation include inflation, percentage of money supply to GDP, trade openness, and population. Three models are utilized including the common constant model, fixed effect model, and random effects model. To determine the most suitable model, the researchers employ the Redundant fixed effects test and the Hausman test for specification testing. The fixed effect model emerges as the most adequate model. The significant P-values obtained from both tests provide evidence in favor of the fixed effect model, indicating that it is the most appropriate choice for understanding the relationships between the independent variables and economic growth in the ASEAN-5 countries. The findings of the fixed effect model show that inflation and money supply are negatively and significantly related to economic growth at the 1% level. Trade openness is positively related to economic growth, but not significantly. Additionally, the population has a significantly positive relationship with economic growth.

INTRODUCTION

The growth in Gross Domestic Product (GDP) is a common indicator, which is concerned by every country. GDP growth represents the country's economic growth. A positive value in GDP means the expansion of the economy. In contrast, when GDP is negative, it means the contraction of the economy. GDP growth is important because it is not only considered the indicator for economic growth only, it also will be used to measure the performance of the government. When economic growth is positive, it led to the effectiveness of the government policy and increases the confidence of the people in the government. If the economy is negative for a long time, it brings political instability. Besides that, economic growth is also a consideration for the foreign investor. When the economic growth is positive, it means that the optimistic for future investment. The tendency to profit gives the confidence to foreign investors to increase their investment to boost their capital. If negative economic growth, they will try to remove their capital and invest in another country to prevent the loss. Hence, GDP growth is an important indicator of the economy and politics in a country.

Southeast Asia is a subregion of Asia located in the southeastern part of the continent. It is a diverse and dynamic region known for its rich cultural heritage, natural beauty, and economic significance. Southeast Asia comprises eleven countries, including mainland countries such as Thailand, Myanmar, Laos, Cambodia, Vietnam, and the island nations of Malaysia, Singapore, Indonesia, Brunei, the Philippines, and Timor-Leste. Geographically, the region is characterized by a mix of landscapes, ranging from dense tropical rainforests, mountain ranges, and fertile river deltas to stunning coastlines and beautiful islands. The equatorial climate in many parts of Southeast Asia provides a warm and humid environment throughout the year. Importantly, Southeast Asia has historically

been a critical region in international trade due to its strategic location as a crossroads between the Indian Ocean and the Pacific Ocean. This geographical advantage has made Southeast Asia a crucial region for global trade routes, connecting major markets in Asia, Europe, and more. Economically, Southeast Asia is a rapidly developing region with significant growth potential. It is known for its strategic location, natural resources, and burgeoning markets. The countries of Southeast Asia are increasingly attracting investments, becoming major players in international trade, manufacturing, and tourism.

However, Southeast Asia consists of different thresholds and categories of countries as shown in Table 1. For instance, Singapore and Brunei are categorized as high-income countries and developed countries. Meanwhile, Malaysia and Thailand are grouped into upper-middle-income countries and developing countries. Other countries, such as Indonesia, Philippines, Myanmar, Cambodia, Laos, Timor Leste, and Vietnam are the lower-middle income countries and developing countries. This circumstance indicates that different income threshold has different potential in the economy. Although the eleven countries are in the same region and have one body of the economy, which is the ASEAN Free Trade Area (AFTA), but the competition still exists between each other. Southeast Asian countries often compete for foreign direct investment (FDI) and access to global markets. They strive to attract investments by offering incentives, improving business environments, and enhancing infrastructure. This competition aims to boost industrialization, create jobs, and improve economic growth. Access and control of natural resources, oil, gas, minerals, and agricultural land, can create tensions among countries. Disputes over territorial waters in the South China Sea, for example, have led to geopolitical rivalries and competition for resources in the region.

Table 1: GNI per capita and the categories of nations in 2022

Country	GNI per capita (US \$)	Threshold Income	Categories
Singapore	67 200	High	Developed country
Brunei	31 410	High	Developed country
Malaysia	11 780	Upper-middle	Developing country
Thailand	7 230	Upper-middle	Developing country
Indonesia	4 580	Lower-middle	Developing country
Vietnam	4010	Lower-middle	Developing country
Philippines	3 950	Lower-middle	Developing country
Laos	2 360	Lower-middle	Developing country
Timor Leste	1 970	Lower-middle	Developing country
Cambodia	1 700	Lower-middle	Developing country
Myanmar	1 210	Lower-middle	Developing country

Sources: World Bank, 2023 and OECD, 2023

Table 2: The thresholds for income classification 2022

Threshold Income	GNI per capita, 2022 (\$)
Lower	Lower than 1085
Lower-middle	1,086 – 4,255
Upper-middle	4,256 – 13,205
High	More than 13,205

Source: World Bank, 2023

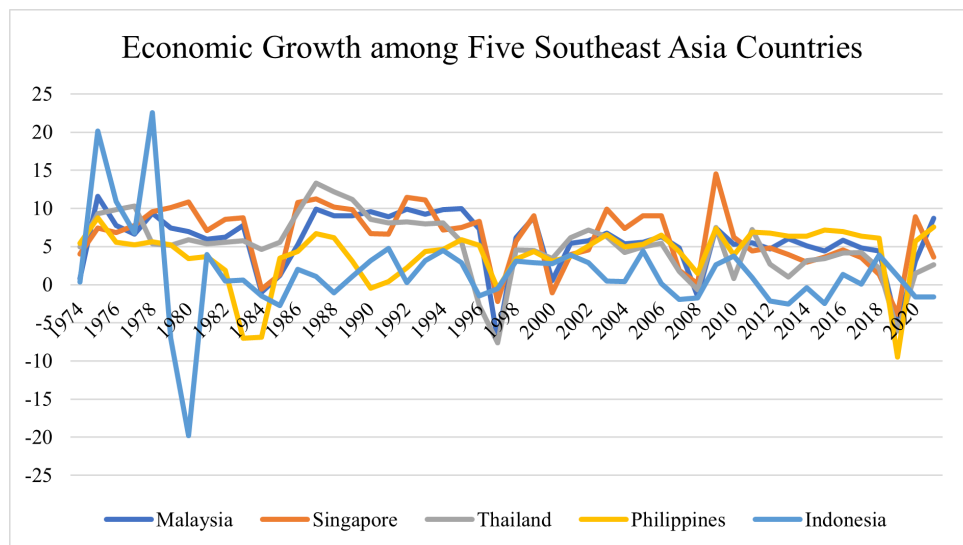


Figure 1: Economic Growth among Five Southeast Asia Countries, 1974 - 2021

Sources: World Bank, 2023

A high-income country, not indicated that it always has positive economic growth. In other words, a low-income country does not necessarily always has negative economic growth. However, the stability of economic growth becomes a crucial role to determine the better performance of economic growth. From Figure 1, it is observed that the trend of economic growth among the ASEAN-5 countries is almost the same. However, when observed clearly, it is found that the different trends of economic growth during the economic crisis. For instance, the ASIAN financial crisis, the Great Recession, and the COVID-19 pandemic crisis. During the Great Recession, Malaysia, Thailand, and Indonesia faced economic recession, and achieved negative economic growth. However, Singapore and the Philippines obtained positive economic growth. Besides that, it is observed that the economic growth of Singapore is more stable than Malaysia, Thailand, Philippines, and Indonesia. The fluctuation of the growth is smaller in the Singapore case.

Economic growth is influenced by other factors. Economic growth has a strong correlation with unemployment. When there is economic growth, it means that job opportunity is sufficient to maintain lower unemployment. The Phillips curve suggests a tradeoff between unemployment and inflation, implying that there is an inverse relationship between these two variables. Specifically, when unemployment is high, inflation tends to be low, and vice versa. An raise in the supply of money can have a boosting effect on the economy by encouraging higher levels of consumer spending. As money supply rises, people have more money in hand, leading to an increase in consumption. This raises aggregate expenditure and contributes to an overall increase in the national income. In summary, an increment in the money supply can boost economic activity by promoting higher consumer spending and ultimately leading to higher national income. Furthermore, trade openness involves both

exports and imports and also exerts an impact on economic growth. Export activities lead to cash inflow, as goods and services are sold to foreign markets and generate revenue for the country. On the other hand, imports result in cash outflow, as the country purchases goods and services from foreign sources. Both export and import activities play a significant role in shaping the overall trade balance and can have implications for a nation's economic growth. In addition, a larger population can provide a labor force advantage to a country. With a substantial labor force, the country can experience increased production capacity, leading to enhanced economic growth. The availability of adequate labor can also lead to lower labor costs. Thus, this makes it more cost-effective for businesses to operate, which further contributes to higher economic growth. Overall, a high population can offer significant benefits in terms of workforce potential and cost advantages, driving the nation's growth.

RESEARCH OBJECTIVE

The overall objective is to analyze the impact of macroeconomic indicators, such as inflation, percentage of money supply to GDP, trade openness, and population on the economic growth in five selected Southeast Asian countries.

LITERATURE REVIEW

Factors influencing economic growth had been investigated by several methods, which comprising of Ordinary Least Square (OLS) (Próchniak, 2011), Autoregressive Distributed Lag (ARDL) (Thaddeus et al., 2021), Vector Autoregression (VAR) (Dritsakis et al., 2006), and Vector Error Correction (VECM) (Abdalla and Hisham, 2015). This study will adopt the panel analysis to investigate the relationship of selected determinants, namely inflation, percentage of the money supply to GDP, trade openness, and population with economic growth among ASEAN-5 countries.

Hoang (2021) stressed the nonlinear connection of inflation towards GDP growth in Vietnam. He noted that the negative impact of inflation on GDP growth took place when inflation is more than 6 percent. However, when inflation is less than 6 percent, it helped to improve economic growth. Ioan et al. (2020) applied the impact of factors between inflation on the economic growth of India, Brazil, and Romania from the period 2005-2017. Researchers found selected countries revealed that inflation was negatively associated with economic growth.

Chaitip et al. (2015) Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR and Cambodia. The macro variables comprise of economic growth-wide phenomena or GDP growth rates and money growth-wide phenomena or money supply, consisting of money (M1 used Autoregressive Distributed Lag (ARDL) approach, specifically the Pooled Mean Group Estimator (PMGE) to develop long-run and the short-run dynamics or the adjustment speed to the long-run equilibrium between supply of money towards economic growth by focusing on Thailand, Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR, and Cambodia. They found that the Pooled Mean Group estimator was the most suitable and appropriate method to examine the dynamics between money supply and economic growth in the selected ASEAN Economic Community (AEC) countries. The use of this estimator provided the most accurate and reliable insights into how changes in money supply relate to economic growth across the AEC region. Hussain, et al. (2017) denoted that the percentage of broad money to GDP had a significant positive impact on economic growth in Bangladesh. In addition, García and Viet (2021) examine how money supply affects economic growth rate, inflation rate, exchange rate, and real interest rate using a panel dataset comprising 217 countries

from 1960 to 2020. They urged that there is a negative correlation between the money growth rate and the GDP growth rate.

Nasreen and Anwar (2014) pointed out the causal relationship between economic growth, trade openness, and energy consumption in 15 Asian countries. The study encompasses data from the 1980 to 2011. The analysis used panel cointegration and causality approaches to explore both the long-run relationship and the direction of causality between variables. By using these methods, the study discovered that bidirectional between GDP growth and trade openness. Besides that, the relationship between both variables exhibited a positive relationship. The statement was supported by Rahman et al. (2017), which stated that there was a bidirectional between trade openness and economic growth. However, Ulaşan (2015) gave another view on this statement. He claimed that higher economic growth did not happen when the trade barrier was lower. This means liberalization did not associate with boost in trade to help increase the economic development of nations.

The relationship between growth in population and growth in economic had been explored by Rahman et al. (2017). They adopted the annual data from 1960-2013 among three major developed countries, namely the United States, United Kingdom, and Canada with three major emerging developing countries, comprising China, India, and Brazil. In their findings, they concluded that the increase in population growth enhanced the economic growth among these six countries. Peter and Bakari (2018) stressed how population growth affects the economic growth in African countries, employing an approach using panel data from 1980 to 2015. The findings from both the difference and system GMM methods indicate that population growth has a positive influence on the economic growth for Africa.

METHODOLOGY

Source of data

The data for the annual growth rate of real Gross Domestic Product (GDPG) and its corresponding independent variables, including inflation rate (INF), percentage of money supply to GDP (MS), trade openness (TRADE), and population (POP), have been collected for the period from 1980 to 2019. The data covers five Southeast Asian countries, which are Malaysia, Singapore, Thailand, Philippines, and Indonesia.

Model Specification

The model can be described as follows:

$$\text{GDPG} = f(\text{INF}, \text{MS}, \text{TRADE}, \text{POP}) \dots (1)$$

$$\text{GDPG}_{it} = \beta_{0it} + \beta_1 \text{INF}_{it} + \beta_2 \text{MS}_{it} + \beta_3 \text{TRADE}_{it} + \beta_4 \text{POP}_{it} + m_{it} \dots (2)$$

Where:

GDP	= Growth rate of real Gross Domestic Product (GDP)
INFL	= Inflation
MS	= Percentage of the money supply to GDP
TRADE	= Trade Openness
POP	= Population
m	= Error term

Empirical Methodology

In this study, three models are employed to analyze the data including the common constant model, the fixed-effect model, and the random-effect model. A balanced panel dataset is used, meaning that there is an equal number of observations for each cross-section or country.

To determine the most suitable model among the three models mentioned earlier, two tests are conducted. The first test is the Redundant Fixed Effects test, which helps assess whether including fixed effects in the model is necessary or if they can be omitted without losing important information. The second test is the Hausman Test, specifically used to examine the presence of correlated random effects. It helps determine whether the random-effect model is more appropriate than the fixed-effect model by evaluating whether the random effects are independent of the independent variables (Gujarati and Porter, 2009).

Both these tests play a crucial role in selecting the appropriate model for this study's panel data analysis.

Common constant model

Common constant model is also known as the pooled Ordinary Least Squares (OLS) method. This model is an estimation technique that assumes there are no variations or differences among the data matrices in the cross-sectional dimension. In other words, it treats all cross-sectional units (countries in this case) as if they belong to a single group with no distinct characteristics.

The model assumes that there are no significant differences between the estimated cross-sectional units. It is implying that the relationship between the dependent variable and independent variables is uniform across all countries. This assumption is particularly useful when the dataset is considered to be a priori homogeneous, meaning that there are no known systematic differences or heterogeneity among the countries before the analysis.

The common constant model involves combining all the data points from different countries and estimating a single regression equation to find the overall relationship between the variables. However, it is important to note that this approach might overlook potential variations and unique characteristics that individual countries might possess. Hence, the equation of the common constant model is as below:

$$GDPG_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \dots (3)$$

Where:

ith = cross-sectional unit

t = the time period

Fixed effects model

The fixed effects model allows for the inclusion of different constants for each cross-sectional unit (country) in the analysis. It is also known as the least squares dummy variables (LSDV) estimator, which enables the estimation of separate constants for each group by incorporating dummy variables.

In the fixed effects model, a unique dummy variable is introduced for each group (country), representing the differences specific to that group. These dummy variables capture the individual characteristics of each country that might influence the dependent variable differently. By including these dummy variables, the model accounts for the specific effects associated with each cross-sectional unit.

Through the fixed effects model, the analysis recognizes and accounts for the inherent heterogeneity and distinctiveness among the countries. The fixed effect model allows for a more precise estimation of the relationships between the dependent and independent variables for each country individually. This approach is particularly useful when dealing with panel data as it considers both the within-group variations and the overall relationship between the variables. Thus, the equation of the fixed-effects model is as below:

$$GDPG_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \alpha_5 D_{5i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \dots (4)$$

Where:

D_{2i} = 1 if observation belongs to cross-section 2 (Singapore), 0 otherwise

D_{3i} = 1 if the observation belongs to cross-section 3 (Thailand), 0 otherwise

D_{4i} = 1 if the observation belongs to cross-section 4 (Philippines), 0 otherwise

D_{5i} = 1 if the observation belongs to cross-section 5 (Indonesia), 0 otherwise

In equation (4), the dummy variable for Malaysia is not included because the intercept term α_1 already represents the intercept specific to Malaysia. The coefficients α_2 , α_3 , ..., and α_8 , known as differential intercept coefficients, indicate how much the intercepts of the other countries differ from the intercept of Malaysia. This is because Malaysia serves as the reference or comparison country in this model.

By omitting the dummy variable for Malaysia, the model captures the unique

intercept for Malaysia through α_1 and allows us to understand how the intercepts of the other countries deviate from Malaysia's intercept. The approach helps in analyzing the relative differences in the intercepts among the countries, providing valuable insights into their individual economic characteristics compared to Malaysia.

Random effects models

In the random effects model, the treatment of constants for each cross-sectional unit

(country) differs from the fixed effects model. Instead of considering the constants as fixed and unique to each country, the random effects model treats them as random parameters.

In this approach, the intercept term is not assumed to be constant across all countries. Instead, it is considered to follow a random distribution, reflecting the variations and heterogeneity among the countries. The model estimates the average intercept across all countries and then allows the individual country intercepts to deviate randomly from this average.

The random effects method captures both the overall relationship between the variables shared among all countries and the specific variations unique to each country. It considers the unobserved country-specific factors that might influence the dependent variable differently for each country. Therefore, the equation of the random-effects model is as below:

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \dots (5)$$

Instead of treating β_{0i} as fixed, it is assumed to be a random variable with a mean value of β_1 . Meanwhile, the intercept for an individual company can be expressed as:

$$\beta_{0i} = \beta_1 + e_i \quad i = 1, 2, \dots, N$$

Where e_i is a random error with a mean value of zero and variance of σ_e^2 . Hence,

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} + e_i \dots (6)$$

If we combined m_{it} and e_i into v_i , then the final equation will become the following:

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + v_i \dots (7)$$

Where $v_i = m_{it} + e_i$

Redundant fixed effects test

The Redundant fixed effects test serves the purpose of evaluating the collective significance of the fixed effects estimates in the least square regression model. Additionally, it helps determine whether including the fixed effects is necessary for the analysis.

When conducting the Redundant fixed effects test, if the F-value turns out to be statistically significant, it indicates that the fixed effects are collectively meaningful and play a crucial role in explaining the variations in the dependent variable across the different cross-sectional units (countries).

If the F-test shows significance, it implies that the pooled regression model. It assumes a common constant for all countries and is not adequate for explaining the data. In such cases, it is recommended to prefer the fixed effects regression model, which allows for individual intercepts for each country, thereby accounting for the country-specific effects.

In summary, if the Redundant fixed effects test yields a significant F-value, it suggests that the fixed effects regression model is more appropriate and provides a better fit to the data than the pooled regression model.

Hausman test

The Hausman specification test is employed to examine the null hypothesis that the coefficients estimated by the efficient random effects estimator are equal to the ones estimated by the consistent fixed effects estimator. This test is essential in deciding whether the random effects model or the fixed effects model is more appropriate for the data.

When the P-value of the Hausman test is not significant, it suggests that there is no substantial difference between the estimates obtained from the random effects and fixed effects models. In such cases, the random effects model is considered suitable as it efficiently captures both the common effects shared among the countries and the country-specific variations.

However, if the P-value of the Hausman test turns out to be significant, it indicates that there is a significant difference between the estimates from the random effects and fixed effects models. Consequently, the null hypothesis assumes the random effects model is consistent and is rejected. In this situation, it is advisable to adopt the fixed effects model, which accounts for individual intercepts for each country and accommodates the presence of unobserved heterogeneity among the countries.

In summary, a non-significant P-value in the Hausman test favors the random effects model, while a significant P-value suggests that the fixed effects model should be preferred due to the presence of significant differences between the two estimators.

FINDINGS

Tables 3 to 7 present the regression results corresponding to the various models applied in the analysis. Each table will showcase the coefficients and statistical significance of the independent variables, allowing us to understand the relationships between the dependent variable and inflation rate (INF), percentage of money supply to GDP (MS), trade openness (TRADE), and population (POP) for the five Southeast Asian countries.

Additionally, Table 8 displays the outcomes of the Redundant fixed effects test and the Hausman test. These tests help us assess the importance of fixed effects and determine the most appropriate model for the data. The results in Table 9 will indicate whether including fixed effects is necessary or if the random effects model is preferable based on the significance levels obtained from the Hausman test.

Table 3: Result of common constant model

Variable	Coefficient	Std. Error	t-Statistic	P-value
INFL	-0.1524	0.0498	-3.0614	0.0025*
MS	-0.0173	0.0098	-1.7617	0.0797
TRADE	0.0088	0.0030	2.9286	0.0038*
POP	0.7619	0.1069	7.1246	0.0000*

*Significant at a 5% level of significance.

Source: EViews 12

Table 4: Result of fixed effects model

Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.1975	1.7018	0.1160	0.9077
INFL	-0.1570	0.0496	-3.1644	0.0018*
MS	-0.0565	0.0170	-3.3247	0.0011*
TRADE	0.0129	0.0095	1.3664	0.1734
POP	1.0819	0.2961	3.6535	0.0033*

*Significant at a 5% level of significance.

Source: EViews 12

Table 5: Corresponding cross-section/ country intercept value (Fixed effects)

Intercept	Country	Value
1	Malaysia	2.4469
2	Singapore	0.0088
3	Thailand	0.8057
4	Philippines	-1.8673
5	Indonesia	-1.3942

Source: EViews 12

Table 6: Result of random effects model

Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.5904	1.6798	0.3515	0.7256
INFL	-0.1524	0.0490	-3.1083	0.0022*
MS	-0.0174	0.0097	-1.7965	0.0740
TRADE	0.0085	0.0031	2.7317	0.0069*
POP	0.6912	0.2269	3.0460	0.0026*

*Significant at a 5% level of significance.

Source: EViews 12

Table 7: Corresponding cross-section/ country intercept value (Random effects)

Intercept	Country	Value
1	Malaysia	3.54E-12
2	Singapore	-9.38E-13
3	Thailand	5.17E-13
4	Philippines	-3.40E-12
5	Indonesia	1.88E-13

Source: EViews 12

Table 8: Result of Redundant fixed effect test and Hausman test

Redundant fixed effects test			
Effects test	Statistic	d.f.	P-value
Cross-section F	2.7182	(4,191)	0.0311
Cross-section chi-square	11.0728	4	0.0258
Hausman test			
Test summary	Chi-sq. statistic	Chi-sq. d.f.	P-value
Cross-section random	10.8728	4	0.0280

Source: EViews 12

Table 3 shows the result of the common constant model. The results indicated all the selected variables, except for money supply, show statistical significance at a 5% level. Money supply demonstrates significance at a 10% level. The findings suggest that inflation and the percentage of money supply to GDP have a negative impact on GDP growth, whereas trade openness and population have a positive impact on GDP growth.

Table 4 shows the result of the fixed effects model. The results reveal a negative relationship between inflation and the percentage of money supply to GDP concerning GDP growth. Conversely, trade openness and population exhibit a positive relationship with GDP growth. The relationships between

inflation, the percentage of the money supply to GDP, and the population with GDP growth are statistically significant, while the relationship with trade openness is not deemed significant.

Furthermore, Table 6 shows the result of the random effects model. In the random effects model, inflation demonstrates a significant negative relationship with GDP growth. Although the percentage of money supply to GDP displays a similar negative relationship, it is not statistically significant. On the other hand, trade openness and population both exhibit a significant positive relationship with GDP growth.

Table 8 shows the result of the Redundant fixed effect test and Hausman test. The results from the Hausman test reveal a significant P-value (0.0280), indicating that the null hypothesis, which suggests that the random effects model is consistent, is rejected. Additionally, the Redundant fixed effects test yields a significant P-value (0.0258), lower than 0.05, which indicates that the fixed effects model is suitable.

As a result, both tests concur in favor of the fixed effects model as the most appropriate among the common constant model, fixed effects model, and random effects model. The fixed effects model is preferred for the analysis as it considers individual intercepts for each country and accounts for unobserved heterogeneity among them, providing a more precise and reliable estimation of the relationships between the variables.

In summary, both the Hausman test and the Redundant fixed effects test led to the same conclusion, indicating that the fixed effects model is the most adequate and suitable choice for this study.

CONCLUSION

The main aim of this study is to determine the most appropriate model for conducting a panel analysis of the factors influencing economic growth in Southeast Asian countries. The study uses real GDP growth as the dependent variable and considers inflation, the percentage of money supply to GDP, trade openness, and population as independent variables. The data used in the analysis covers the period from 1980 to 2019 and includes five Southeast Asian countries: Malaysia, Singapore, Thailand, Philippines, and Indonesia. The Hausman test and the Redundant fixed effects test both suggest that the fixed effects model is the most suitable for examining economic growth in these

countries. The results of the fixed effect model indicate that inflation and money supply have a negative relationship with economic growth and are statistically significant at a 1% level. On the other hand, the relationship between trade openness and economic growth is positive but not significant. Moreover, there is a significant positive relationship between population and economic growth.

The study suggests that it is prudent to implement strategies that effectively manage both inflation and money supply to boost economic growth. The data indicates that maintaining stable inflation rates and carefully regulating the money supply can substantially contribute to fostering economic expansion. Besides that, there is a significant positive relationship observed between population growth and economic growth. This can be achieved by directing efforts toward enhancing education, healthcare, and employment opportunities. By transforming population growth into a resourceful human capital base, economic development can be effectively stimulated. The study has some limitations, such as the absence of complete data for Vietnam, Brunei, Cambodia, Myanmar, Laos, and Timor Leste, which prevents a comprehensive analysis of all Southeast Asian countries. To improve future research, it is recommended to expand the independent variables used in the analysis. Including additional factors such as government debt, unemployment, and human capital index can provide more insights into the drivers of economic growth in the region.

In summary, the study finds that the fixed effects model is the best fit for understanding economic growth in the mentioned Southeast Asian countries. Nevertheless, future research should aim to include more variables and expand the data coverage to gain a more comprehensive understanding of economic growth across all Southeast Asian nations.

REFERENCES

- Chaitip, P., Chokethaworn, K., Chaiboonsri, C., & Khounkhalax, M. (2015). Money Supply Influencing on Economic Growth-wide Phenomena of AEC Open Region. *Procedia Economics and Finance*, 24(July), 108–115. Retrieved from [https://doi.org/10.1016/s2212-5671\(15\)00626-7](https://doi.org/10.1016/s2212-5671(15)00626-7).
- Dritsakis, N., Varelas, E., & Adamopoulos, A. (2006). The main determinants of economic growth: An empirical investigation with Granger causality analysis for Greece. *European Research Studies* 9(3), 1–22. Retrieved from http://www.ersj.eu/repec/ers/papers/06_34_p4.pdf.
- García, M.J.O., & Viet, L.T. (2021). The Impact of Money Supply on the Economy: A Panel Study on Selected Countries. *Journal of Economic Science Research*, 4(4), 48–53. Retrieved from <https://doi.org/10.30564/jesr.v4i4.3782>.
- Gujarati, D.N. & Porter, D.C. (2009). *Basic Econometrics*, 5th ed. New York: McGraw Hill Inc.
- Hoang, T.N. (2021). Relationship between inflation and economic growth in Vietnam. *Turkish Journal of Computer and Mathematics Education*, 12(14), 5134–5139.
- Ioan, B., Malar K.R., Larissa, B., Anca, N., Lucian, G., Gheorghe, F., Horia, T., Ioan, B., & Mircea-Iosif, R. (2020). A Panel Data Analysis on Sustainable Economic Growth in India, Brazil, and Romania. *Journal of Risk and Financial Management*, 13(8), 1–19. Retrieved from <https://doi.org/10.3390/jrfm13080170>.
- Mohamed, A.A., & Hisham, H.A. (2015). Determinants of Economic Growth in GCC Economies. *Asian Journal of Research in Business Economics and Management*, 5(1), 18–23.
- Mohammed, E.H., & Mahfuzul, H. (2017). Empirical Analysis of the Relationship between Money Supply and Per Capita GDP Growth Rate in Bangladesh. *Journal of Advances in Economics and Finance*, 2(1), 54–66. Retrieved from <https://doi.org/10.22606/jaef.2017.21005>.
- Nasreen, S., & Anwar, S. (2014). Causal relationship between trade openness, economic growth and energy consumption: A panel data analysis of Asian countries. *Energy Policy*, 69(1), 82–91. Retrieved from <https://doi.org/10.1016/j.enpol.2014.02.009>.
- OECD. (2023). List of developed and developing countries 2018. Retrieved from https://www.oecd-ilibrary.org/sites/f0773d55-en/1/4/3/index.html?itemId=/content/publication/f0773d55-en&_csp_=5026909c969925715cde6ea16f4854ee&itemIGO=oecd&itemContentType=book.
- Peter, A., & Bakari, I. H. (2018). Impact of Population Growth on Economic Growth in Africa: A Dynamic Panel Data Approach (1980–2015). *Pakistan Journal of Humanities and Social Sciences*, 6(4), 412–427. Retrieved from <https://doi.org/10.52131/pjhss.2018.0604.0055>.
- Próchniak, M. (2011). Determinants of economic growth in Central and Eastern Europe: The global crisis perspective. *Post-Communist Economies*, 23(4), 449–468. Retrieved from <https://doi.org/10.1080/14631377.2011.622566>.
- Rahman, M. M., Saidi, K., & Ben, M.M. (2017). The effects of population growth, environmental quality and trade openness on economic growth: A panel data application. *Journal of Economic Studies*, 44(3), 456–474. Retrieved from <https://doi.org/10.1108/JES-02-2016-0031>.
- Thaddeus, K. J., Ngong, C. A., Nebong, N. M., Akume, A. D., Eleazar, J. U., & Onwumere, J. U. J. (2021). Selected macroeconomic determinants and economic growth in Cameroon (1970–2018) “dead or alive” an ARDL approach. *Journal of Business and Socio-Economic Development*. <https://doi.org/10.1108/jbsed-05-2021-0061>.
- Ulaşan, B. (2015). Trade openness and economic growth: panel evidence. *Applied Economics Letters*, 22(2), 163–167. Retrieved from <https://doi.org/10.1080/13504851.2014.931914>.
- World Bank. (2023). GNI per capita. Retrieved from <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD>.
- World Bank. (2023). New country classifications by income level: 2019–2020. Retrieved from <https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2022-2023>.