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ASSESSING FINTECH BEHAVIORAL ADOPTION TO ENHANCE FINANCIAL READINESS FOR RETIREMENT AMONG MALAYSIAN GIG WORKERS: A CONCEPTUAL FRAMEWORK

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Abstract*:* *The rapid growth of gig economy has sparked worry about gig workers ability to retire with dignified financial wellbeing especially when employer-based benefits are absent and their incomes are inconsistent. Nowadays, financial technology (fintech) has become increasingly pertinent in financial management, offering everyone including gig workers new method to monitor their income, schedule automatic savings and to contribute voluntarily to their personal retirement fund. Yet, the studies about how their willingness to adopt fintech may influence their Financial Readiness for Retirement (FRR) are still limited. This paper proposes a conceptual framework that associates Fintech Behavioral Adoption (FBA) to FRR, grounded in the Net Valence Framework (NVF). In this model, FBA is shaped by how gig workers weigh the benefits of fintech such as easy to use, lower costs, and better financial oversight against the risks they associate with it, including privacy concerns and possible financial loss. When perceived benefits outweigh perceived risks, gig workers are more likely to adopt fintech to manage their finance and subsequently improve their FRR. The framework recommends a new insight for policymakers, financial institutions and platform providers seeking to design digital financial tools that useful for this vulnerable groups for preparing for their retirement age.*

Keywords*:* *FinTech Behavioral Adoption, Financial Readiness for Retirement, Gig Workers, Net Valence Framework, Perceived Benefits, Perceived Risks*

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Background
Retirement wellness has become one of the most alarming socioeconomic issues globally including Malaysia, as the labour force shifts toward more flexible and informal forms of jobs. Mainstream retirement systems such as the Employees Provident Fund (EPF) were designed for formal employment. However, the workforce in 21st century is increasingly characterised by temporary contracts, self-supervision, and digital platform-based work. In this environment, individuals must assume self-managed investing, saving, and managing financial wellbeing during retirement. In December 2024, EPF increased Retirement Income Adequacy (RIA) Framework to guide members at visualising and planning for their different level of retirement lifestyles based on income needs. The amount of saving that allow a modest but decent retirement lifestyles has been increased from RM240,000 to RM390,000 (EPF, 2025). Yet, according to Nurhisham Hussein, the Chief Strategy Officer of the EPF, an estimated 96% of Malaysians could not afford to retire solely on their EPF savings, and 73% of active contributors lack sufficient funds to retire above the poverty line (Employees Provident Fund, 2025).

The rapid expansion of the gig economy has intensified these challenges. Malaysia has witnessed a significant increase in the number of gig workers, driven by digital platforms such as Grab and Foodpanda. This development became more visible during the COVID-19 pandemic, during which p-hailing services became a necessity. From supply side, Abdullah et al. (2025) made a similar observation, noting that gig participation has surged since the COVID-19 pandemic as workers sought flexible working arrangement and supplementary income. Many of them also work in e-hailing and p-hailing sector to replace their job after retrenchment during pandemic.

Nowadays, the growing availability of fintech presents a potential opportunity for people to improve current financial situation by building healthier financial habit. Digital financial tools such as mobile banking, e-wallets and micro-investment platforms offer gig workers more accessible way for managing current and future finance. Most transactions are free, and the convenience of being able to save or invest through a phone helps to reduce behavioural obstacles that often stop people from taking action. Fintech also enhances financial habit by providing tracking features to its users to monitor how much has been accumulated to reach their goals. Over time, fintech would instil the idea that consistency matters more than the amount and saving a small figure is still better than saving nothing at all. Despite these advantages, fintech's potential to improve retirement readiness remains underexplored in the Malaysian gig worker context (Kamarul Zaman, Ismail & Abd Samad, 2025).

Problem Statements
Gig workers face with set of financial vulnerabilities that stem mainly from how irregular their income can be. Their working hours are inconsistent from week to week and they have limited access to employer-sponsored benefits. These conditions cause saving is not their priority and thereby hinder their ability to plan for retirement. Study by Aizad et al. (2023) found that gig workers often prioritise immediate financial spending needs which is quite common given the nature of their earnings. However, this short-term focus will hinder them from planning for their long-term retirement wellbeing. Without consistent contributions to retirement fund or financial discipline, they risk entering retirement life without adequate funds. This situation is critical in Malaysia where life expectancy is increasing and where retirees from private sectors typically depend on personal savings rather than comprehensive national pension systems. Even though gig works provide some level of economic resilience, it is still lacking in social protection. Job guarantees as gig workers is also weak because they have limited bargaining

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power in the case of dispute with customers. Low registration for i-Saraan by EPF has proved that regular contribution to EPF is not common practice among gig workers, making them highly vulnerable to long-term financial insecurity.

Although several reports (Bank Negara Malaysia, 2023; IDinsight, 2023; MyDIGITAL Corporation & Ipsos Malaysia, 2024) highlight how fintech can promote financial inclusion, very few have specifically studied how gig workers' adoption of fintech tools can influence their Financial Readiness for Retirement (FRR) (Aizad et al., 2023; Kamarul Zaman et al., 2025). Most research on retirement planning still inclines towards the familiar themes like financial literacy, savings behavior, or demographic factors, but less attention is given to the role of technology in shaping financial behavior for long term goal. Furthermore, studies on fintech adoption tend to centre on issues like perceived benefits, usability, or trust without associating adoption behavior to long-term financial outcomes. In particular, the study on relationship between Fintech Behavioral Adoption (FBA) and FRR in the context of perceived benefits and perceived risks remains limited in Malaysia.

Objectives

This conceptual paper aims to fill this gap by proposing a framework that explains how FBA influences FRR among Malaysian gig workers. In this study, FBA is conceptualised as a multidimensional shaped by two perceptions of fintech which are perceived benefits (PB) and perceived risks (PR), using the Net Valence Framework (NVF) as its theoretical basis.

The proposed framework has several implications for policymakers, platform providers, financial institutions, and social protection agencies such EPF, Credit Counselling and Debt Management Agency (AKPK) and Social Security Organisation (SOCSO). Understanding how fintech adoption influence retirement readiness can inform these stakeholders to design the targeted policies or initiatives for gig workers. For practitioners and fintech developers, findings from this study may offer guidance for the creation of more inclusive digital financial services that address gig workers' limitation and unique needs. Strengthening fintech adoption among gig workers can contribute to broader national goals of improving retirement adequacy, build financial resilience and reducing poverty among Malaysia's future elderly population.

Literature Review

Gig Economy and Financial Vulnerability in Malaysia

The rapid expansion of the gig economy in Malaysia has brought a new norm to the labour market by offering more flexible income opportunities. However, the nature of gig work, if not handled carefully, could worsen financial irregularities that many gig workers already face. Platform-based work particularly in food delivery, e-hailing, courier and logistics, and freelance services has grown substantially, driven by digitalisation, technological advancement, and the economic fallout from the pandemic (Low & Memon, 2025). Before the introduction of Gig Workers Bill 2025, this type of works remains operated in grey area, legal protection was absent, the workers have weak labour rights, and unstable incomes despite its role in reducing the impact of unemployment. Studies consistently emphasized that gig workers remain outside employment protection systems, leaving them with limited access to social safety net, health benefits, and retirement schemes (Uchiyama et al., 2025; Ali et al., 2025; Abdullah et al., 2024). Such structural gaps have raised concerns over income insecurity and long-term financial wellbeing. Empirical work shows that inconsistent income is a major cause of financial vulnerability among gig workers (Mohd Daud et al., 2024). Since many rely on daily or weekly

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income flows and lack of emergency fund, they are highly exposed to drop in demand and economic downturns. This aligns with earlier observations that gig workers exhibit low financial resilience and struggle with long-term financial planning (Samad et al., 2023). The absence of employer-supported retirement scheme further worsens their financial fragility, as voluntary contribution to EPF, SOCSO, or takaful plans are frequently postponed or avoided entirely due to affordability constraints (Ali et al., 2023).

Legal and regulatory gaps worsen these vulnerabilities even further. Comparative analyses show that Malaysian gig workers, like their Indonesian counterparts, are excluded from the standard employee classification, which limit their legal rights, bargaining power, and access to social security protection (Ali et al., 2023; Amin, 2023). These weaknesses contributes directly to precarity, as gig workers are treated as commodity under platform capitalism and are always victimised to unilateral algorithmic management with little government intervention (Uchiyama et al., 2024; Uchiyama et al., 2025). Yet, despite these challenges, studies also note that gig workers—especially the young ones—are attracted to join this sector, because it offers flexibility, autonomy, and digital work opportunities (Mohd Hed & Abu Yahya, 2025; Mohd Hed & Rosli, 2025). This suggests that vulnerability within the gig workforce is not standard for all. Instead, it varies depending on age, background, and motivations.

Financial Readiness for Retirement (FRR)

Yakoboski et al., (2020) and Xue et al. (2020) defined FRR as the extent to which an individual possesses sufficient financial resources and ecosystem that allow them to plan for it to maintain a dignified lifestyle after retirement. This definition is closely aligned with the view of Kim et al. (2025) and Ibrahim & Rahman. (2023), who conceptualized FRR as an individual's financial capacity and resource adequacy to meet the needs during retirement without compromising today's well-being. Ekerdt & Adamson (2024), Chen et al. (2024) and Xiao & Chen (2023) also discussed FRR as an individual's ability to ensure they can afford the future material, housing, and support needs, while maintaining preferred lifestyle and consumption patterns at present.

Even though Malaysian government has provided several incentives like i-Saraan and SOCSO to boost voluntary social protection, the participation remains low showing that workers neither fully understand the benefits of saving, not aware nor can consistently afford to contribute to retirement schemes (Samsudin et al., 2024; Uchiyama et al., 2022). This is the major problem that causes chronic under-saving condition throughout their working life and lower the opportunity to achieve FRR. In line with that, Nawawi et al. (2025) and Mohd Nasir et al. (2024) also stressed on weak financial literacy, lack budgeting skills, tax knowledge and having extravagant lifestyle as reasons for under-saving problem among younger gig workers. At the same time, gig workers also need to deal with platform-driven issues that are beyond their control such as declining fare structures, fuel costs burden, and limited bargaining power which potentially reduce their disposable income and limit their FRR (Uchiyama et al., 2025).

FBA and FRR

Overall, the existing literatures suggests that fintech can effectively enhance FRR. However, that relationship must be facilitated by digital literacy, behavioural interventions, and collaboration with gig platforms. Tan, Lim and Cheah (2020) found that fintech such as mobile banking, e-wallets, and robo-advisors can encourage better saving discipline and long-term financial habits to its users hence positively associated with retirement planning behaviour. Fintech like robo-advisors to some extent provide opportunities for younger and lower-income Malaysians to invest as they are low-cost, transparent, and able to provide automated

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investment guidance which in the past were done only through expensive service from financial advisors (Tan Lim and Cheah, 2020). However, disparities in digital capability mean older and less tech-savvy individuals benefit less from fintech adoption.

Among underprivileged Malaysians, fintech adoption interacts with behavioural and psychological factors. Samsudin et al. (2024) found that PB of fintech platforms do not necessarily influence retirement planning activities, because those financial behaviours mainly stemmed by healthy mental well-being. For example, despite the benefits offered by Malaysia's i-Saraan schemes which also rely on digital infrastructure, the uptake remains low due to lack of awareness, procrastination, and income instability (Uchiyama et al., 2022). This indicates that the effectiveness of fintech depends not only on accessibility but also on individuals' psychological aspect. For gig workers, fintech shows even clearer potential when integrated into platform ecosystems. Samsudin et al. (2022) report that even though Malaysian gig workers face fluctuating income stream and low retirement savings, yet many express willingness to contribute if digital mechanisms allow flexible, small, real-time contributions. For instance, the EPF–GoGet partnership enables workers to channel earnings directly into EPF through the gig platform. This example illustrates how embedded fintech solutions can help to convert inconsistent incomes into more structured retirement savings.

Theoretical Underpinning

In this study, the relationship between fintech adoption and FRR is grounded in the Net Valence Framework (NVF) by Peter & Tarpey (1975), which visualises adoption of fintech will take place only if net valence is positive as a result of rational assessment made by individual on its PB and perceived risk PR. In fintech adoption, this framework implies that individuals will adopt digital financial services when the expected utility such as convenience, efficiency, security, or cost savings is greater than its perceived costs, including privacy concerns, financial risks, or performance uncertainties.

There are a few studies have adopted NVF in many realm of decision making process among modern consumers. For example, in contexts involving health or safety cues such as COVID-19, Abdul-Rahim et al. (2022) apply NVF directly by modelling PB and PR as competing antecedents of fintech adoption among Malaysian consumers. It is found that PB display a stronger influence on adoption intention than PR. Similarly, Al-Debei et al. (2024) adopt a net-valence perspective in examining iris-based fintech authentication, treating perceived value as the net result of benefit–risk evaluation and demonstrating that benefits enhance perceived value while risks reduce it, ultimately shaping intention to use.

Beyond fintech, several technology adoption studies operationalise NVF through risk–benefit trade-off models or value-based adoption frameworks, which explicitly conceptualise adoption as a net evaluation between positive and negative valences. For example, Kim et al. (2007) frame mobile internet adoption as a balance between perceived usefulness and perceived risk, concluding that users adopt when perceived gains outweigh expected losses. Likewise, Yang et al. (2015) apply a value-based adoption model that is grounded in NVF theory into mobile banking usage, showing that perceived value emerges from comparing benefits (e.g., availability, accessibility and convenience) with sacrifices (e.g., risk, effort), and that this net value strongly predicts actual usage. In the e-payment and digital wallet domain, Oliveira et al. (2016) similarly demonstrate that adoption is shaped by a benefits–risks calculus, where security and convenience drive value while privacy concerns reduce it

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Conceptual Framework

Perceived Benefits

In this study, PB is defined as one's personal assessment of the positive value they may receive from fintech adoption for managing their finance. In the fintech context, existing literatures suggest that PB include greater convenience, speed and ease of use, cost or time savings, increased accessibility, and enhanced financial security one can enjoy by using fintech (Abdul-Rahim et al., 2022; Al-Debei et al., 2024). Abdul-Rahim et al. (2022) and Dawood et al. (2022) opined that these benefits can strengthen perceived value among users and intention to adopt fintech services, as they believe those tools promote more efficient financial transaction and effective financial management.

Extending this to the gig economy, PB from utilizing fintech for gig workers would include features like self-determined contribution to retirement fund, automatic transfers from gig works income to retirement accounts, real-time tracking of savings, and free advisory functions, nudge reminder. All these benefits are meant to reduce the cognitive and administrative burden of planning for old age while flexible enough for gig workers who generally earn unstable incomes. In simple words, the more gig workers perceive fintech to can help them to plan for retirement, the higher will be their PB and, theoretically, the stronger their motivation to use these tools to build FRR.

Perceived Risks

On the other hand, PR is as an individual's subjective judgment of potential negative outcomes that the use of a financial technology may bring upon its users. In the literatures on fintech, perceived risk typically involves worry about financial loss, privacy and confidentiality, and performance or system failure (Abdul-Rahim et al., 2022; Al-Debei et al., 2024). Empirical findings consistently show that these PR reduce perceived value and can erode the intention to adopt fintech solutions if they are not sufficiently offset by perceived benefits (Abdul-Rahim et al., 2022; Dawood et al., 2022). For instance, users may worry that digital platforms expose them to fraud, misuse of personal data or unauthorised transactions, even when they recognise the convenience and cost advantages.

In the gig work setting, PR reflects gig workers' anxieties about using financial apps that integrate their platform earnings with savings or retirement products whether due to worries about hidden charges, financial loss, data misuse, or diminished control over their already volatile income streams. Because many gig workers operate with tight and highly variable cash flows, strong perceptions of risk surrounding fintech-based retirement solutions can significantly dampen their intention to allocate part of their earnings to long-term savings. Consequently, high PR may constrain the ability of fintech tools to improve their FRR.

FBA as a Second-Order Construct

In this study, FBA is conceptualised as a second-order latent construct that captures an individual's overall pattern of using FinTech for day-to-day financial management, saving, investing and retirement planning, rather than a single, isolated behaviour. In PLS-SEM terms, the second-order FBA construct is reflected by several first-order dimensions (PB and PR), each measured by multiple items. Considering FBA as a second-order construct fits the idea that fintech adoption is multidimensional, covering several different but related types of services. By modelling PB and PR as its own first-order factor and then combining them under

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one higher-order FBA factor, the researcher can capture this complexity in a single construct while reducing problems of multicollinearity between highly correlated dimensions.

This logic parallels with Abdul-Rahim et al.'s (2022) argument that fintech adoption should be modelled in a way that reflects the breadth of digital payment and transfer channels used by Malaysian consumers (e.g., online and mobile banking, contactless cards, e-wallets, foreign exchange and cryptocurrency wallets) rather than treating each in isolation. In the context of gig workers, conceptualising FBA as a second-order construct is especially appropriate, because typically utilize multiple FinTech functions like receiving income via platforms, using e-wallets or instant transfers for daily spending, and potentially using savings or investment products for retirement. A higher-order FBA construct therefore provides a more holistic indicator of how deeply gig workers' FRR can be supported by FinTech ecosystem.

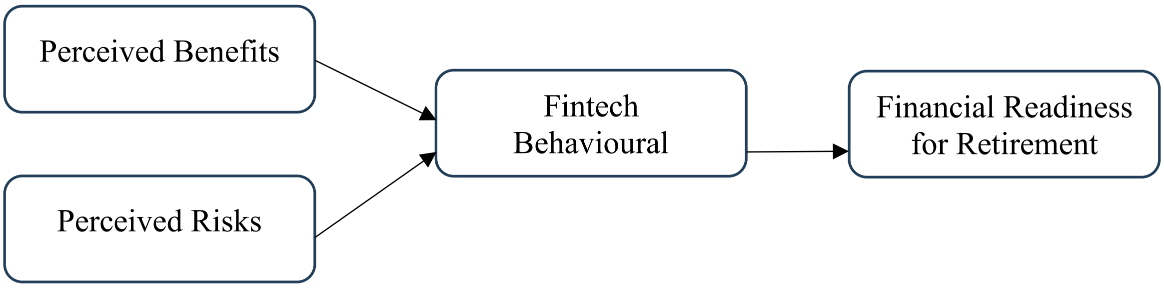

Figure 1: Conceptual Framework

Implications of the Conceptual Model

Theoretical Contributions

The proposed model makes several contributions to the retirement and fintech literature. First, it extends retirement readiness research by explicitly incorporating digital adoption behaviour as a central antecedent of FRR. Existing work on retirement planning in Malaysia has largely focused on financial literacy, attitudes and demographic factors (e.g., Tan, Lim, & Cheah, 2020), while digital channels are often treated as mere delivery mechanisms. By modelling FBA as a second-order construct, the framework conceptualises FRR as increasingly related with a bundle of digital activities—such as using e-wallets, online banking, digital savings and robo-advisory services.

Second, the model integrates the Net Valence Framework (NVF) with retirement readiness models, offering a benefit–risk lens to explain why individuals (particularly gig workers) choose to adopt or avoid fintech tools for long-term saving. Based on NVF, perceived benefits and perceived risk act as opposing variables, and their overall balance determines fintech adoption (Abdul-Rahim, Bohari, Aman, & Awang, 2022; Al-Debei, Hujran, & Al-Adwan, 2024). By embedding this theory within a retirement context help the researcher to understand not only whether people's tendency to adopt fintech, but how that adoption influences gig workers to achieve FRR. Finally, by positioning gig workers as a focal population, the model enhances researchers' theoretical understanding of gig worker unique financial behaviour, moving beyond short-term finance activities to shape long term retirement preparedness (Samsudin, Mohd Khan, Hasan, Mohd Daud, & Ng, 2022; Uchiyama, Furuoka, & Md Akhir, 2022).

Practical Contributions

Practically, the conceptual model offers actionable proposal for policymakers, particularly institutions such as the EPF, Ministry of Finance (MOF) and Bank Negara Malaysia (BNM). By clarifying the roles of perceived benefits, perceived risk, and FBA in driving FRR among gig workers, the model can inform these institutions to design more effective plan that effective to reduce psychological barriers among gig workers for saving for their retirement. For instance by embedding EPF and gig platform, retirement savings calculator and savings tracker appeared within gig platforms. It also highlights the importance of minimizing perceived risk through stronger consumer protection, transparent fee structures and clear communication, thereby enhancing trust in digital retirement channels. In addition, financial institutions can design an effective promotional materials to persuade gig workers that the risks of using fintech can be minimized if they know the right way to handle fintech.

For fintech developers and platform providers, the model will suggest several types of features likely to reduce behavioural obstruction and to cut a long red tape to encourage adoption for retirement purposes. Such as, flexible contribution options aligned with irregular income flows, goal-based dashboards that can visualise progress toward retirement targets, automated sweeps from gig income to retirement accounts, and in-app infographics that help gig workers to simplify complex products. The core idea from NVF suggest that design should simultaneously amplify salient benefits and mitigate perceived risks. In addition, the model underscores the need for targeted digital financial literacy strategies for gig workers that will be delivered via apps, platforms and social media. This strategy will strengthen their ability to evaluate fintech products, interpret risk–return investment and make consistent, retirement-oriented decisions.

Social Implications

At the societal level, the model has important social implications. It shows that when fintech tools are simple, trustworthy, and easy to use, they will attract people with small and inconsistent amounts of money to turn it into real retirement savings. For gig workers and others without employers driven schemes, this offers a meaningful way to build future security that once overlooked by them. In long run, higher FRR among these groups could reduce old-age poverty and lessen government's fiscal pressure on public safety nets.

Furthermore, by focusing on decent work conditions, fair social protection and inclusive digital finance, the model aimed to suport Sustainable Development Goal (SDG) 8 (Decent Work and Economic Growth) and SDG 1 (No Poverty). Strengthening gig workers' ability to transform their uncertain income into long-term financial security contributes directly to reducing the economic gap between formal and informal workers. In this sense, the conceptual model is not only an academic contribution but also a framework with potential to improve policies and innovations that promote more resilient, retirement-ready and socially protected gig workers in Malaysia.

Future Research Direction

To achieve its objectives, the research will adopt a quantitative, cross-sectional survey design, targeting gig workers involved in e-hailing, p-hailing, and other platform-based work. A quantitative approach will be adopted because it saves cost and time, providing an opportunity to investigate a larger sample size compared to a qualitative approach (Sekaran & Bougie, 2013). Data will be collected using an online self-administered questionnaire, which is practical given the digitally connected nature of gig work. Established multi-item Likert scales will be adapted to measure key constructs such as perceived benefits, perceived risk, FinTech

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behavioural adoption (modelled as a second-order construct) and FRR. Non-probability sampling (purposive and snowball) will be used to reach a sufficiently large and diverse sample of gig workers across platforms and regions. Data analysis will follow a PLS-SEM approach, to handle the complexity of the model and the inclusion of higher-order constructs. The analysis will proceed in two main steps: first, assessing the measurement model (reliability, convergent and discriminant validity), and second, evaluating the structural model, including the effects of perceived benefits and perceived risk on FinTech adoption, and the subsequent impact of FinTech adoption on FRR. Where relevant, multi-group analysis (e.g., level of education) can be employed to explore whether the relationships differ across key segments.

Conclusion

This paper advances a theoretical model that links FBA to FRR among Malaysian gig workers. The proposed framework portrays the decision making process made by gig workers pertaining their engagement with digital financial tools. The model summarises that when gig workers believe fintech would offer them more benefit over risks, they are more likely to adopt these tools consistently. This behavioral adoption, in turn, is expected to strengthen their retirement preparedness by promoting participation in voluntary retirement schemes such as i-Saraan and Private Retirement Scheme (PRS). When designed to be trustworthy, user-friendly, and low-risk, FinTech tools can encourage informal workers to savings for retirements, thereby, expanding inclusivity to groups that have been underserved by formal retirement systems. Finally, this study reaffirms the urgency of addressing gig workers' financial vulnerability. Strengthening their financial readiness is not merely an individual responsibility but an alarming societal needs. The proposed conceptual model highlights how fintech adoption can serve as intervention to mitigate these vulnerabilities. It calls on policymakers, platform providers, and financial institutions to engineer digital tools that not only effective and convenient but also to build long-term financial resilience among Malaysia's growing gig workforce.

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