TECH FOR GOOD INSTITUTE

Digital Financial Services for Financial Inclusion in Southeast Asia

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About This Study

In October 2021, the Tech for Good Institute (TFGI) published **The Platform Economy: Southeast Asia's Digital Growth Catalyst**, which surveyed the state of the digital platform economy across SEA-6 countries: the Philippines, Malaysia, Indonesia, Vietnam, Singapore and Thailand. Digital financial services (DFS) were found to be integral components of the platform economy, with the potential to address the challenge of financial inclusion. The interest to better understand DFS adoption across SEA-6 motivated this project.

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Acknowledgements

Disclaimer

About the Tech for Good Institute

TFGI is a non-profit organisation on a mission to leverage the promise of technology and the digital economy for inclusive, equitable and sustainable growth in Southeast Asia.

With a population twice the size of the United States, Southeast Asia's digital economy is evolving rapidly. Technology has and will continue to have a tremendous impact in aiding the region's development. We are optimistic about technology's potential to advance growth, while recognising that innovation shapes, and is shaped by cultural, social, political and economic contexts.

TFGI serves as a platform for research, conversations and collaborations focused on Southeast Asia but connected to the rest of the world. Its work focuses on topics at the intersection of technology, society and economy, and that are intrinsically linked to the development in Southeast Asia. We seek to understand and inform policy with rigour, balance and perspective, through research, effective outreach and evidence-based recommendations.

TFGI was founded by Grab, Southeast Asia's leading superapp, to advance the vision of a thriving and innovative Southeast Asia for all. We welcome opportunities for partnership and support, financial or in-kind, from organisations and individuals committed to fostering responsible innovation and digital progress for sustainable growth in the region.

Executive Summary

Digital financial services (DFS) are a significant contributor to Southeast Asia's economic progress and has the potential to further advance financial inclusion in the region. Though growing in the region in terms of revenue, firms and investments, but there is still headroom for growth.

Frequently cited barriers affecting the uptake of DFS in the region include pervasive cash cultures, and gaps in physical and digital infrastructure. Consumers' backgrounds — such as their levels of education, employment status and gender — have also been cited as factors in the adoption and usage of DFS. This research complements existing studies by examining digital literacy, financial literacy and consumer trust in DFS providers as predictors of usage of DFS.

↗ Trust is high in both banks and DFS providers in SEA-6.

Overall levels of trust in both banks and digital financial service providers are high across SEA-6 countries: the Philippines, Malaysia, Indonesia, Vietnam, Singapore and Thailand. Trust in DFS providers is slightly lower than trust in banks in all the countries surveyed. This finding echoes a recent study in Southeast Asia showing that new entrants in the financial technology (fintech) space are catching up with established financial service players in gaining consumer trust.[1]

↗ Digital literacy is important when it comes to accessing and using DFS.

Digital literacy is the most consistent predictor of both e-wallet and non-e-wallet DFS usage in all six countries surveyed. This finding is unsurprising as a minimum familiarity with digital technologies is needed to access and use all DFS. For unbanked and underbanked individuals who had been excluded from the formal economy, basic digital literacy skills are crucial for them to access and use financial services on their mobile devices.

↗ Financial literacy is needed to move adoption beyond payments.

E-wallet services that facilitate payments and transactions are designed to have a low barrier to adoption, which explains their popularity and rapid adoption among consumers. On the other hand, non-e-wallet services like insurance, investment and loans are more complex and either necessitate a minimum level of familiarity or appeal to certain types of users only. Financial literacy is a significant predictor of non-e-wallet usage in all countries.

↗ **Financial literacy is a common predictor of trust in DFS providers in all six countries. Other demographic factors are less consistent predictors of trust in DFS providers.**

Financial literacy predicts trust in DFS providers in all six countries while digital literacy predicts trust in DFS providers in the Philippines, Thailand and Vietnam. Other demographic and socioeconomic factors — such as income, employment, education, gender and age — predict trust less consistently across countries.

↗ **Trust predicts DFS usage differently across SEA-6.**

Trust levels are significantly different between users and non-users of DFS. Trust in providers positively predicts e-wallet usage in the Philippines, Singapore and Thailand but not in Indonesia, Malaysia and Vietnam. When it comes to non-e-wallet products, trust in DFS providers positively predicts usage in Malaysia and Singapore only.

↗ **Integrity and communication are important predictors of trust in DFS providers, while propensity to trust technology is not.**

Integrity and communication are important predictors of trust in DFS providers in all countries. When it comes to banks, integrity is a significant predictor of trust in all countries while communication is a predictor in Malaysia, the Philippines, Singapore and Vietnam. Propensity to trust technology — one's relationship to and perception of technology in general — does not predict trust in any of the six surveyed countries when accounting for the other antecedents of trust, comprising communication, competence, integrity and reputation. These findings suggest three key recommendations for governments and providers, as they work together to realise the potential of DFS to accelerate financial inclusion.

1. Build on existing trust and reframe the understanding of trust

High levels of trust in financial service providers across SEA-6 is a solid foundation for the region's financial inclusion agenda. For governments, trust can act as a ballast when balancing the dual needs of encouraging innovation and ensuring stability in the financial system. For incumbent banks, trustworthiness is important but insufficient to keep customers. DFS providers, on their own or in partnership with a bank, have the potential to earn more trust as they embed their services into the lives of their consumers.

2. Invest in digital and financial literacy first

Digital literacy and financial literacy are important when it comes to predicting usage of DFS and trust in providers. Initiatives to improve financial literacy and digital literacy are especially important to further encourage confident usage and financial inclusion, especially among more marginalised and vulnerable populations.

3. Consider trust alongside demographic and socioeconomic factors for financial inclusion

Policies to improve financial inclusion should be comprehensive and encompass a variety of demographic and socioeconomic factors because they affect and interact with each other. While our study found that trust in providers does not necessarily convert to actual usage of DFS in all countries — Indonesia and Vietnam in particular — it would still be useful to include trust in the equation for encouraging DFS usage and advancing financial inclusion. This will enable policymakers and providers in the region to assess the efficacy of their trust-building initiatives, and gain insights on gaps and opportunities available to better leverage trust for DFS adoption.

1.
Digital Financial Services for Financial Inclusion in Southeast Asia

The COVID-19 pandemic has not only accelerated the growth of Southeast Asia's digital economy but also drastically transformed how we spend, shop, work and carry out essential activities. One in three digital consumers in SEA-6 countries — the Philippines, Malaysia, Indonesia, Vietnam, Singapore and Thailand — had either purchased something online or subscribed to digital services for the first time during the pandemic, and nine out of 10 new digital consumers intend to continue using at least one digital service.[2] These digital consumers are actively participating in the digital economy: average digital spending per consumer grew by 60% from US$238 in 2020 to US$381 in 2021. Most significant is the 85% increase in the region's online retail penetration rate, growing from 5% in 2020 to 9% in 2021, outpacing those of China (10% increase or 1 percentage point growth) and India (5% increase or 2 percentage points growth).[3]

Enabling and propelling the growth of the digital economy are digital financial services (DFS) and, in particular, digital payments. Digital payments are the fastest growing DFS category and contribute approximately 82% of total DFS revenue in Southeast Asia, far exceeding those generated by lending, investment, remittance and insurance.[4] Traditional digital payments, as alternatives to cash and cheques, encompass credit cards, debit cards, prepaid cards and account-to-account transfers. Digital wallets (or e-wallets) go beyond transactions to allow users to load funds to pay for goods and services. Unlike earlier forms of prepaid digital payment modes such as smart cards used for transport systems and phone cards, e-wallets are offered purely digital. The transaction value of e-wallets quadrupled between 2019 and 2021.[5] E-wallets are also the preferred payment method for online transactions, overtaking cash in 2021: 37% of consumers prefer e-wallets while 28% prefer cash.[6]

Beyond e-wallets, DFS can span a broad range of financial services accessed and delivered through digital technologies. Other DFS services like lending, insurance and investment have also shown great potential in the region and are expected to grow by more than 20% by 2025.[7] This study has grouped all non-e-wallet services into a single category for our analysis.

E-wallets: A gateway to financial inclusion in Southeast Asia

E-wallets are the most frequently used digital payment method and they are particularly popular in Southeast Asia: the total number of e-wallets users have consistently exceeded those in the United States (US), United Kingdom (UK) and European Union (EU) since 2018.[8] The role of e-wallets in accelerating financial inclusion in the region cannot be underestimated. Given the relatively low barriers to entry, e-wallets are typically an individual's first experience with digital payments.[9] For the 70% of population in Southeast Asia who are considered unbanked or underbanked,[10] e-wallets allow them to bypass the formal banking system and access previously unavailable basic financial services.

E-wallets are easy to use and are useful to the users, both of which are shown to be important determinants of a user's intention to adopt and use new technologies.[11] Social influence[12] and perceived technical and organisational infrastructure have also been cited to be important in determining user intention to adopt new technologies.[13] Specific to e-wallets, facilitating conditions include capabilities of the mobile phone used to access e-wallets, customer support provided by the provider, and user interface of e-wallet products.

Digital financial services are offered by both banks and DFS providers. As traditional financial institutions, banks offer a wide range of products including credit cards and insurance. Banks maintain their licence to operate through compliance within mature regulatory frameworks. Non-bank DFS providers typically offer and deliver their services through digital channels only, often initially with banks or other incumbent players such as insurance companies to offer their services. However, this landscape is evolving rapidly, with Indonesia, Malaysia, the Philippines and Singapore having issued digital bank (or digibank) licences or granted banking licences to pure digital banks, with Thailand expected to follow suit in the near future.[14]

The Potential of Digital Financial Services to Advance Financial Inclusion

A 2020 study by the Asian Development Bank Institute[15] shows that DFS has drastically transformed the financial inclusion landscape in recent years by achieving what traditional banking systems and microfinance could not. Traditional banks cannot adequately serve lower income individuals due to constraints such as minimum transactions, one-size-fits-all risk management tools and documentation requirements. While the microfinance model expanded financial services among the poor and marginalised populations in many developing countries, it is also very labour-intensive and often not profitable.

In comparison, DFS, enabled by digital technologies and innovations, has drastically reduced the costs of serving both banked and underbanked consumers and improved risk management capacities. The Tech for Good Institute[16] (TFGI) finds that three quarters of micro, small and medium enterprises (MSMEs) with loans from digital providers had previously been unable to secure financing from banks and other lenders. Digital providers such as Grab Financial Group can serve consumers efficiently with scalable digital channels. They also use alternative sources of data to develop credit risk models that reflect the nature of MSMEs and are able to offer micro-financing products to meet the needs of these businesses.

At the institutional level, DFS enable governments and businesses to participate in the digital economy and benefit from fast transactions, streamlined processes and improved efficiency of resource allocation. DFS can help governments spearhead digitalisation and accelerate efforts to expand e-governance, while businesses can use data from financial transactions to generate market insights to offer better services and products to their customers.

On the direct-to-consumer front, DFS can increase financial inclusion by expanding access for many unbanked or underbanked consumers, which account for some 70% of the adult population in Southeast Asia.[17] DFS features such as digital identification systems can eliminate physical barriers to accessing financial services, and new forms of payment methods offer underserved consumers more flexibility and options to participate in the formal economy. Innovative product designs like gamification[18] or robo advisors[19] simplify financial services like insurance, loans and investment, making them less daunting and more accessible.[20]

Barriers to DFS Adoption

Commonly cited barriers hindering the advancement of DFS may be categorised into structural barriers and barriers directly concerning individual consumers. The former includes gaps in pervasive cash culture, and gaps in physical infrastructure and digital infrastructure. The latter includes consumer's digital literacy, financial literacy and consumer trust. These two categories of barriers do overlap and sometimes interact with each other.

However, this paper focuses on the barriers that directly concern the individual consumers, namely digital literacy, financial literacy and consumer trust in DFS providers in Southeast Asia.

Structural Barriers to DFS Adoption

Governments have a central role to play in addressing structural barriers. Beyond continuing to expand access to reliable and affordable internet, governments can support safe and inclusive digital payments infrastructure through mechanisms such as incentives, national consolidation of payment systems, and data standards and protections. Countries in the region have made significant recent progress on this front, (e.g. Singapore's Payment Services Act of 2019[21] or Thailand's Payment Systems Roadmap[22]).

⬈ Physical infrastructure

Reliable mobile internet networks and logistics capacity is indispensable to the proper functioning and growth of the digital economy. Economist Impact's Inclusive Internet Index 2021[23] ranks Southeast Asian countries middle of the pack in terms of the coverage and quality of their internet services. The lack of accessible and affordable internet services not only negatively impacts individuals, but also at a structural level as countries strive to keep up in an increasingly digitalised world.

⬈ Digital infrastructure

The systems processing and delivering financial services are also key limiting factors to expanding DFS in the region. With only an estimated 55% of mobile internet subscribers in the adult population in the region,[24] Southeast Asian countries such as Indonesia, the Philippines and Vietnam have room for improvement in digital infrastructure, including 'soft' infrastructure such as "data standards, microservices, interoperable systems, and interconnections between databases."[25]

⬈ Cash Culture

Cash is the most frequently used payment method (38%) compared to digital methods such as e-wallets (20%), mobile banking apps (12%) and mobile payment apps (2%).[26] Similarly, many businesses in the region are still largely cash-based with more than 70% of merchants accepting cash only,[27] making it difficult for consumers who might prefer paying via digital payment methods.

Individual Factors Affecting DFS Adoption

↗ Digital Literacy

Digital literacy refers to the digital skills that enable an individual to safely access information, communicate and avail important services in order to participate in the digital economy.[28] Mobile broadband covers 96% of the population in Southeast Asia but only 57% are considered connected as 39% of the population have yet to subscribe to a mobile internet service.[29] One of the main reasons explaining this gap is the lack of digital skills.

According to World Bank data,[30] as of 2021, 41% of people in Southeast Asia had used a mobile phone or the internet to check account balances compared to 79% in the US and 72% in the UK. When it comes to using a mobile phone or the internet to pay bills, 34% of people in Southeast Asia had done so in 2021 compared to 66% in the US and 52% in the UK. Improving digital literacy is important for accelerating financial inclusion in the region because digital skills and digital technologies are crucial entry points into personal finance, enabling many unbanked and underbanked individuals access to basic financial services.[31]

↗ Financial Literacy

Financial literacy or "how well an individual can understand and use personal finance-related information"[32] is key when it comes to advancing financial inclusion.[33] In addition to having awareness and knowledge of financial products, financial literacy is also important when it comes to helping consumers manage their own risks and protect themselves when making important financial decisions.

Improving financial literacy, the basic driver of banking status, in the region is of utmost importance as four of the SEA-6 countries currently rank in the bottom half of 144 countries.[34] Low levels of financial literacy is a barrier to financial inclusion and this challenge is compounded by the lack of formal financial education programs in some countries.[35]

↗ Trust

Trust refers to "the confidence or willingness to rely on a service provider's competence and reliability [as well as]...care and concern the partner demonstrates."[36] Consumer trust has been cited as crucial not only for consumer confidence and engagement with the financial sector, but also for the proper functioning of the economy as a whole.[37]

Trust is difficult to measure and define because it is not directly observable. Yet it is worth studying as trust has been shown to be an important factor when it comes to predicting an individual's intention or willingness to use these products. Country-specific research in Indonesia,[38] Philippines,[39] and Vietnam[40] has shown that trust plays a role in predicting positive attitudes towards DFS and the intention to adopt such services.

In Indonesia, trust has positively influenced the attitude towards both digital payments and the intention to use digital payments. In the Philippines, trust has a significant influence on non-adopters' behavioural intention to use online banking services. In the same study, researchers also find that demographic variables like gender, age, education and income level do not have significant impact on trust and the willingness to use mobile banking. There is also evidence that trust in providers is linked to higher rates of interactions and adoption of services and products.[41] Similarly, a lack of trust has been shown to lead to decreased interactions with providers and decreased adoption of services and products.[42]

This study therefore seeks to determine the role of digital literacy, financial literacy and trust in consumer adoption, as consumers face new challenges associated with digital technologies like data privacy concerns and nascent regulatory environments, in addition to the typical risks and uncertainties underlying interactions with the financial services industry.

This study was conducted at the tail end of the COVID-19 pandemic in November 2021. Other factors beyond digital literacy, financial literacy and trust have certainly influenced DFS adoption as well. Existing contactless payment methods such as credit and debit cards, for example, have been widely available in Singapore and Malaysia. In fact, credit and debit cards are the most frequently used payment methods in Singapore (56%) and Malaysia (30%), the highest among the SEA-6 countries.[43] For countries with fewer or less ubiquitous cashless payment systems, DFS adoption, particularly e-wallets, have increased during the pandemic for reasons related to safety, convenience and necessity.[44]

2.
Trust in Financial Institutions in Southeast Asia

Trust is difficult to measure because it is not directly observable. In this study, trust is treated as a latent variable that can be inferred from various observable indicators. This conceptual model of trust is informed by existing literature and adapted from a model derived from Johnson and Grayson.[45] The model supposes a link between levels of trust and product usage; individuals who trust providers more are more likely to use more products from this type of provider. The antecedents in the model — communication, competence, integrity, reputation and propensity to trust technology — have been tested by these researchers to be crucial in measuring and predicting trust. Refer to **Figure 1**.
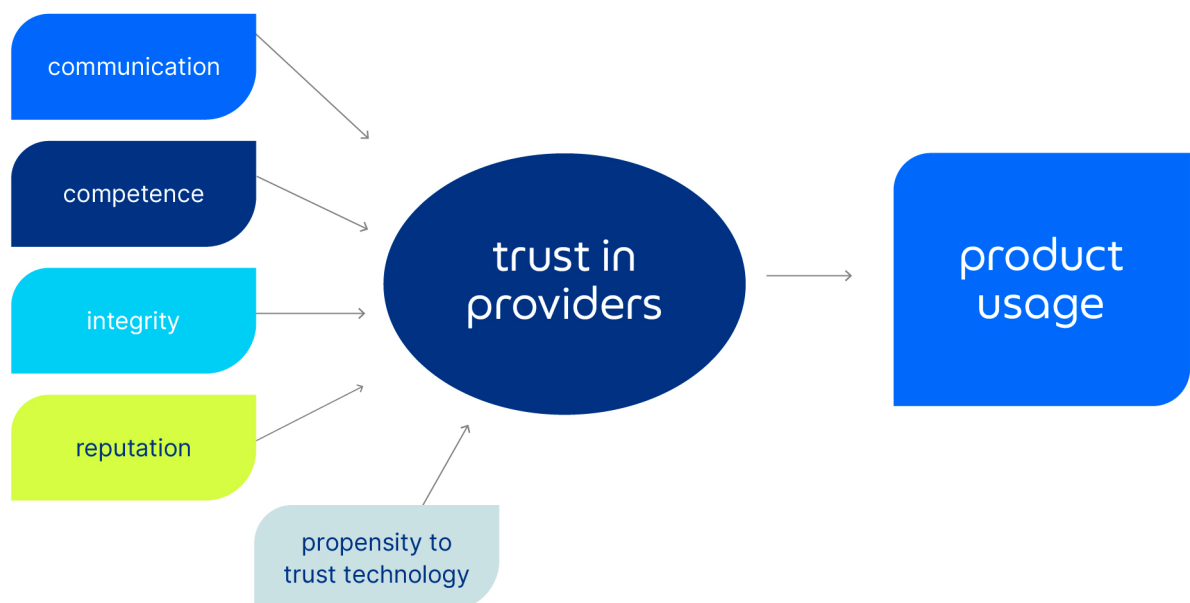
Figure 1: Schema of trust model

High Levels of Trust in Banks and DFS Providers Across SEA-6

Overall levels of trust in both banks and DFS providers are high across SEA-6.[46] Trust in banks is slightly higher than in DFS providers, a pattern that carries over across all the countries surveyed. This finding echoes a recent study in Southeast Asia showing that new entrants in the fintech space are catching up with established financial service players in gaining consumer trust.[47] Refer to **Figure 2**.
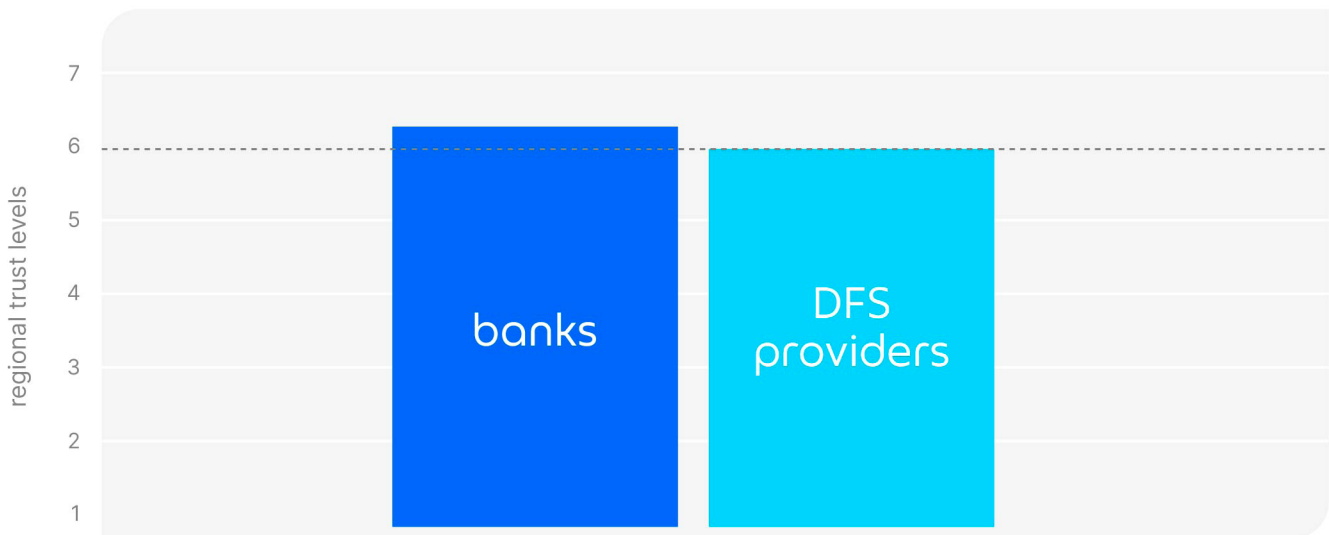
Figure 2: Overall levels of trust in banks and DFS providers in SEA-6[48]

In comparison to the high trust in and marginal difference between banks and DFS providers in this study, other studies on consumer trust in the US reveal that consumers are more likely to trust traditional financial institutions over DFS providers. The difference observed varies: a study by McKinsey[49] has observed a difference of three percentage points whereas, the Bank of International Settlements has found a difference of 35 percentage points.[50] In another study, US consumers are increasingly receptive to DFS, two-thirds of them will only consider DFS provided by their banks but not DFS providers.[51]

A UK study on the shift in consumer perceptions of financial service providers during the pandemic finds that public sentiments towards both banks and DFS providers have fallen, with DFS providers experiencing a significant drop of 14 percentage points compared to 5 percentage points for banks. While it is difficult to draw comparisons across regions and countries given the different nature of studies, it appears that consumer trust in SEA-6 is consistently high, with traditional financial institutions having an edge over DFS providers.

Consumers Value Integrity in Both Banks and DFS Providers

Integrity is found to be a significant predictor of trust in both banks and DFS providers in all countries surveyed. A provider perceived to be virtuous and ethical by doing the right thing and treating people fairly are trustworthy and reliable to consumers. The ubiquity of integrity as an antecedent of trust in both banks and DFS providers is particularly significant because integrity as a concept is tied to both affective and cognitive trust. Integrity is both an indication of the ability to "espouse values seen as positive"[52] and to act in accordance with those values. The former points to how banks and DFS providers are seen to adhere to principles of fairness and justice, which speaks of affective trust. The latter, acting according to values, is connected to principles and the resulting predictability of banks and DFS providers' actions, which speaks of cognitive trust. Both of these dimensions are therefore crucial to building trust in financial institutions, whether they are established like banks or new arrivals like DFS providers.

Onus on DFS Providers to Communicate Transparently

Communication extends beyond responsive customer service to expectations of providers' performance and transparency in the way they conduct business. Communication is found to be a significant predictor of trust in DFS providers in all countries. When it comes to banks, the communication aspect is significant in Malaysia, Philippines, Singapore and Vietnam, but not in Indonesia and Thailand.

Beyond a Relationship With Technology

While the propensity to trust technology is found to be a significant antecedent of trust in both banks and DFS providers on its own, it does not predict trust after accounting for the other antecedents of trust, namely, communication, competence, integrity and reputation. This suggests that insofar as the propensity to trust technology is linked to trust in financial providers, the attitudes and sentiments that inform it are also reflected within the other antecedents.

This finding is an interesting juxtaposition to many studies studying the adoption and usage of new technologies with the technology acceptance model (TAM).[53] According to TAM, usage of technology is influenced by perceived usefulness, ease of use of technologies, and users' behavioural intentions and attitudes towards these technologies.[54] TAM has been a much-used tool to understand the predictors of technological adoption. Our findings, however, suggest that interventions to increase DFS usage — at least among users who share similar profiles as our respondents — could focus less on the role of technology and more on the role of providers.

Trust in Banks and DFS Providers Works Differently Across SEA-6

Despite the similar levels of trust in banks and DFS providers, they are informed by different antecedents across countries.

↗ **Integrity** is a measure of a provider's virtue, demonstrating their sense of justice and adherence to sound moral principles. A provider with high integrity is one that adheres to rules and regulations while treating all its customers fairly and equally. The concept of fairness signals predictability and reliability to consumers, which builds trust.

Integrity is found to be a significant predictor of trust in both banks and DFS providers in all countries surveyed.

↗ **Communication** is not merely the one-way flow of information for transactional purposes; effective communication is assessed based on the quality of information and the manner in which information is conveyed. Consumers assess a provider's communication style positively when the provider is responsive to their queries and keeps them informed of new products. Open and transparent communication is important when building a relationship based on trust.

Communication is found to be a significant antecedent of trust in DFS providers among respondents in all countries. When it comes to banks, communication is an antecedent of trust in Malaysia, Philippines, Singapore and Vietnam, but not in Indonesia and Thailand.

↗ **Competence** is a measure of a provider's perceived ability to provide value to consumers. It is assessed based on a provider's perceived ability to handle client requests, efficiency in carrying out tasks and level of knowledge. A provider that is successful at what they do can inspire trust in consumers.

Competence is found to predict trust in both banks and DFS providers in Indonesia, Malaysia, Philippines and Vietnam. In Singapore, competence predicts trust in banks but not in DFS providers. In Thailand, it predicts trust in DFS providers but not in banks.

↗ **Reputation** is a measure of a provider's perceived standing in the industry, and rests on how respondents evaluate others' perceptions of a provider. Consumers are more inclined to trust a reputable provider that is highly regarded in the industry.

In this study, reputation is a less significant antecedent of trust in banks compared to others, predicting trust only in Indonesia and Malaysia. With regards to DFS providers, reputation predicts trust in Indonesia, the Philippines and Thailand. Reputation does not predict trust in either banks or DFS providers in Singapore and Vietnam.

↗ **Propensity to trust technology** is a measure of a consumer's relationship with technology and perception of its importance and benefits in terms of effectiveness, value, utility and functionality. An individual who perceives technology in a positive manner will be more likely to accept, adopt and use technology in their daily lives.

As previously mentioned, respondents' propensity to trust technology does not affect trust levels in banks or DFS providers on average after accounting for the four other antecedents.
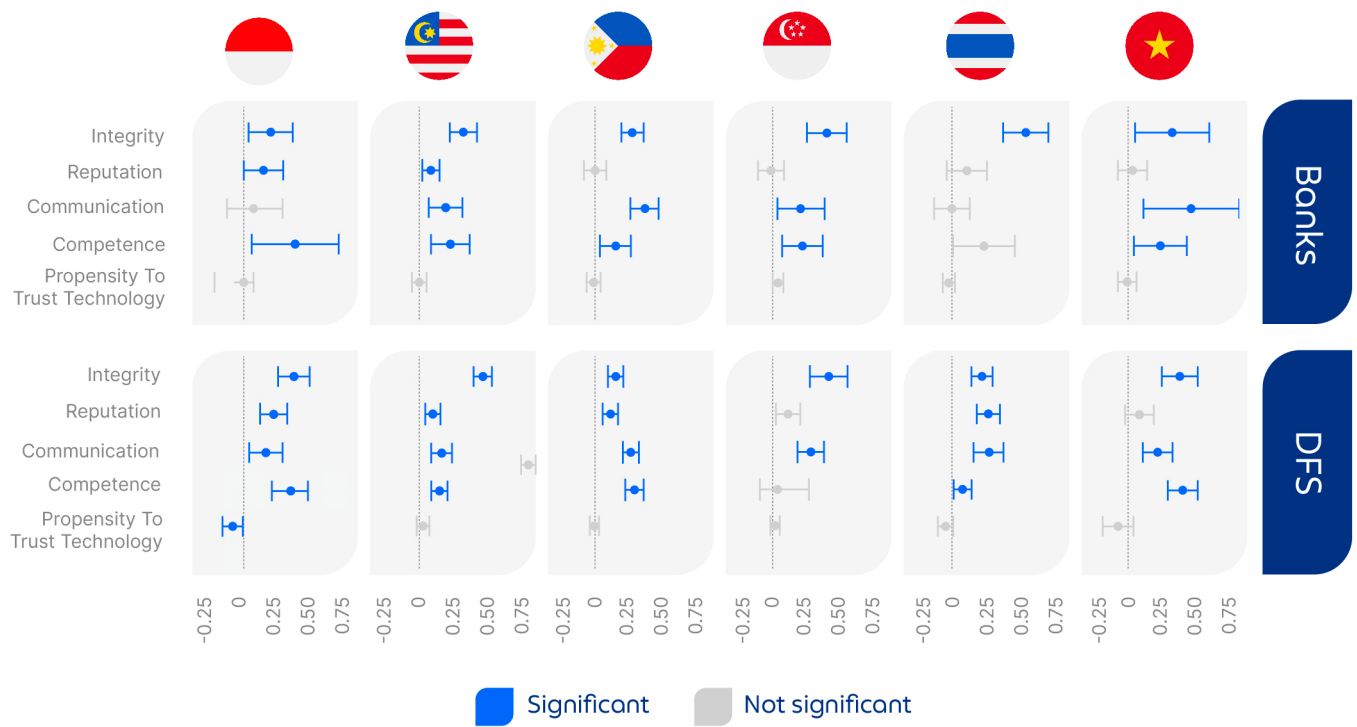
Figure 3: Antecedents predicting trust for banks and DFS providers[55]

3.
Predictors of DFS Adoption

Importance of Digital Literacy in Using and Accessing DFS
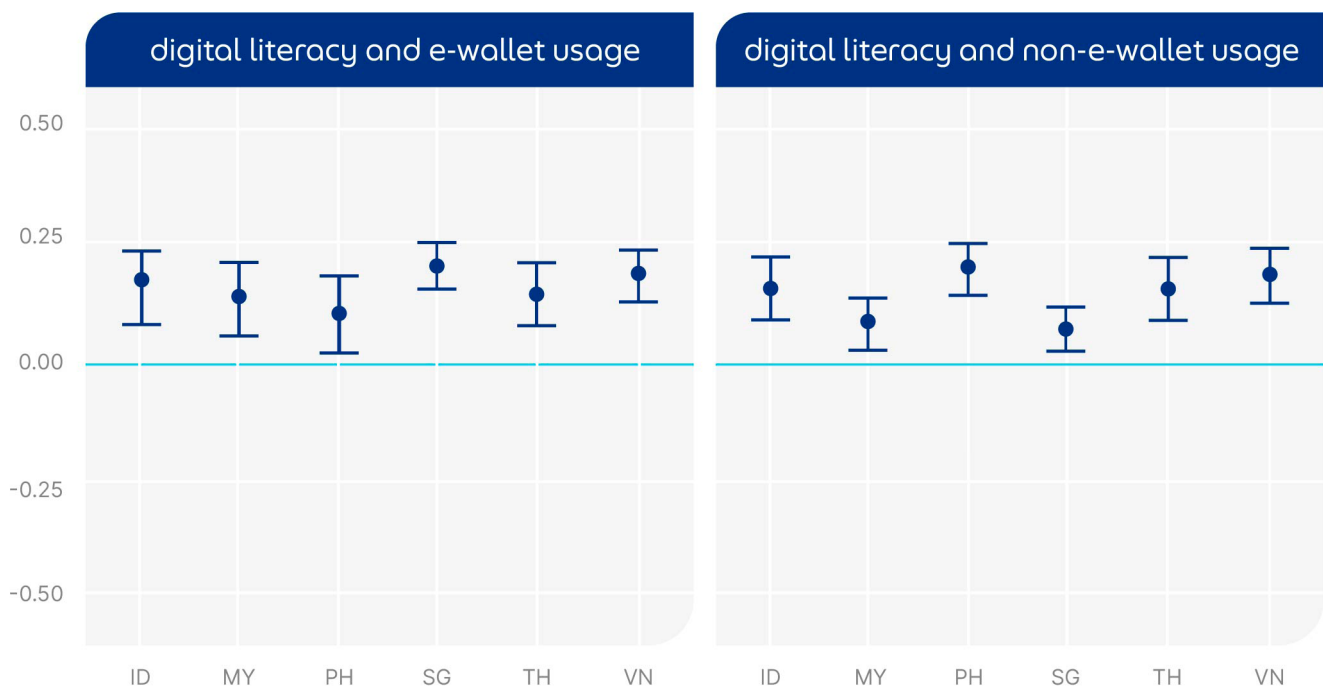
Figure 4: Comparing the effect of digital literacy on the usage of e-wallets and non-e-wallet products

Digital literacy is found to be the most consistent predictor of both e-wallet and non-e-wallet DFS usage in all six countries surveyed. This finding is unsurprising considering that a minimum familiarity with digital technologies is needed to access and use DFS. Among the respondents, there is a pronounced and statistically significant difference in the digital literacy levels of those who do not use DFS and those who have some level of DFS usage. Refer to **Figure 5**.
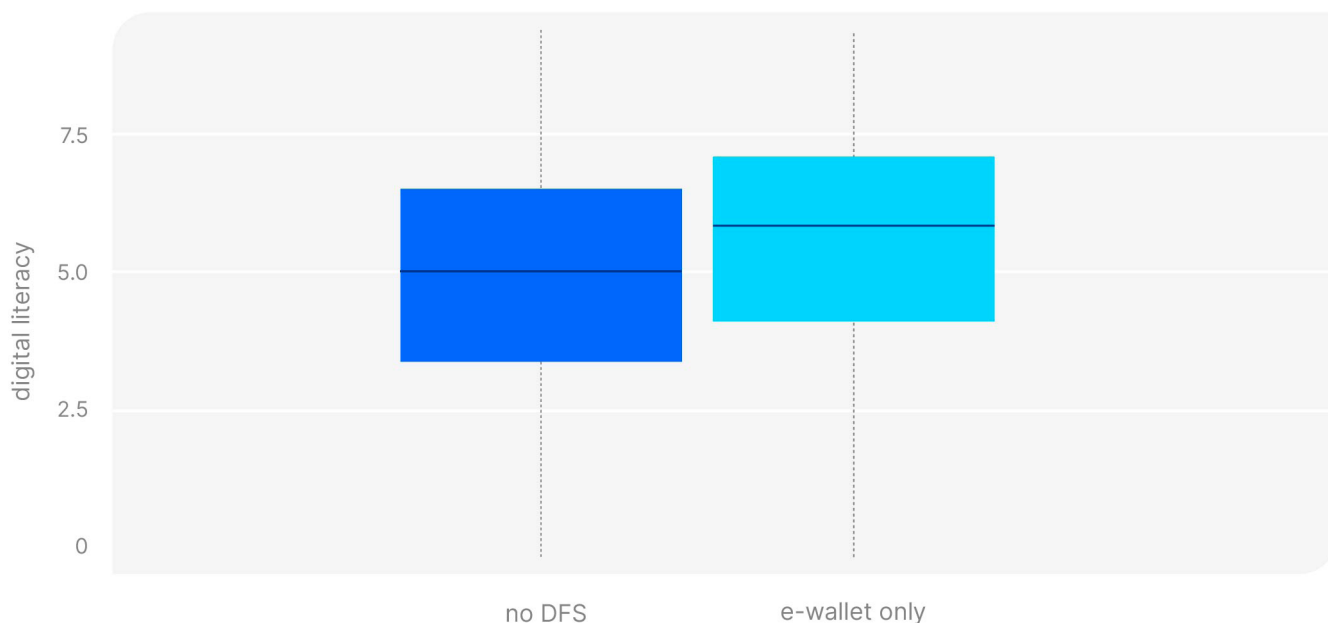
Figure 5: Comparing digital literacy of respondents who only use e-wallets to non-DFS users

For unbanked and underbanked individuals who have been excluded from the formal economy, they require basic digital literacy skills to access basic financial services on their mobile devices. Beyond financial services, digital literacy also allows people to meaningfully take part in the digital economy and take advantage of opportunities brought about by advances in digital technologies.[56]

Financial Literacy Is Needed to Move Adoption Beyond Payments
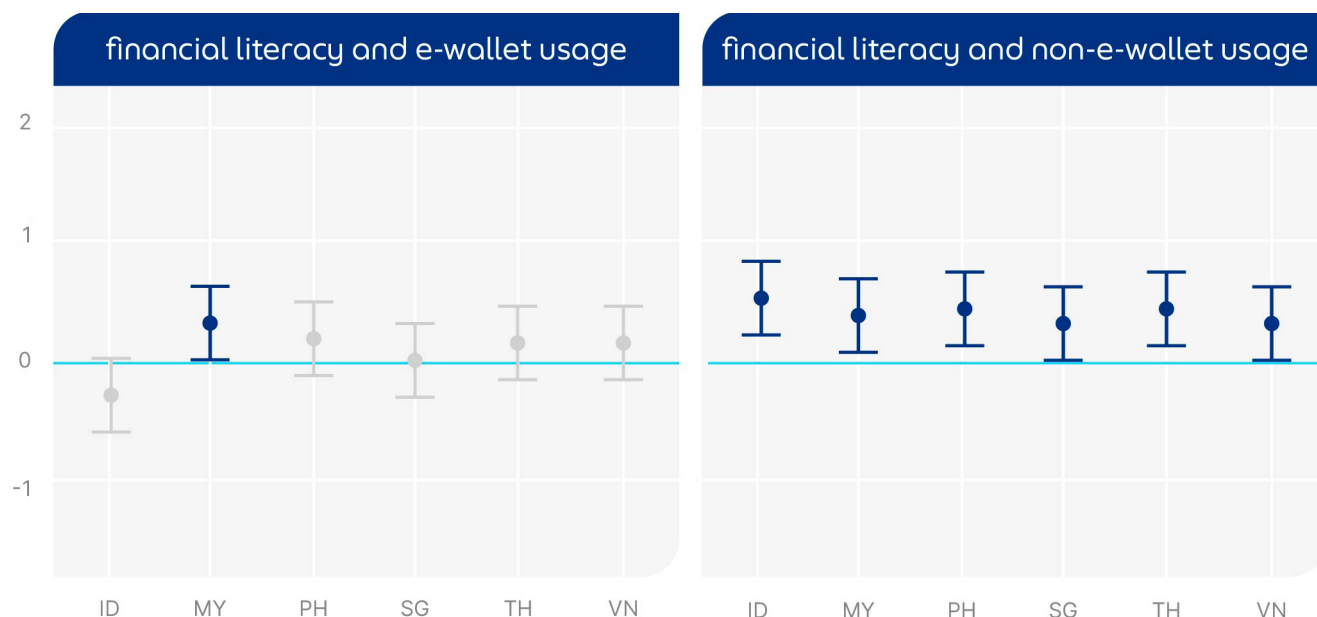
Figure 6: Comparing the effect of financial literacy on the usage of e-wallets and non-e-wallet products

E-wallets are designed to have a low barrier to entry, hence a rapid adoption among consumers. On the other hand, non-e-wallet products like insurance, investment and loans are more complex. Research on financial literacy and trust in financial services suggest that those with higher levels of financial knowledge are more likely to trust financial institutions.[57]

In this study, financial literacy positively predicts usage of e-wallets only in Malaysia (refer to **Figure 6**). On the other hand, financial literacy significantly predicts non-e-wallet usage in all countries. Financial literacy levels of respondents who use no DFS and those who use e-wallets only are similar and relatively lower than those who also use non-e-wallet products (refer to **Figure 7**).
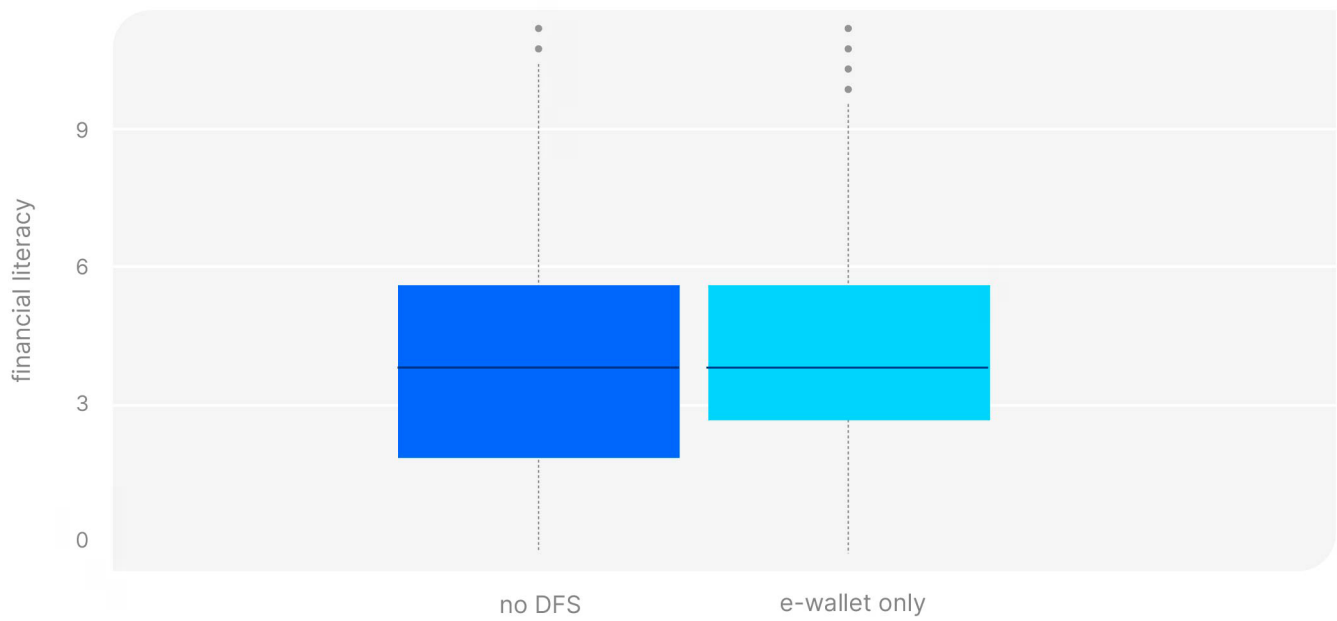
Figure 7: Comparing financial literacy of respondents who only use e-wallets to non-DFS users

Financial literacy is also found to be the most consistent and significant predictor of trust in DFS providers in all six countries. In contrast, the effect of digital literacy is less consistent, predicting trust in DFS providers in the Philippines, Thailand and Vietnam (refer to **Figure 8**).
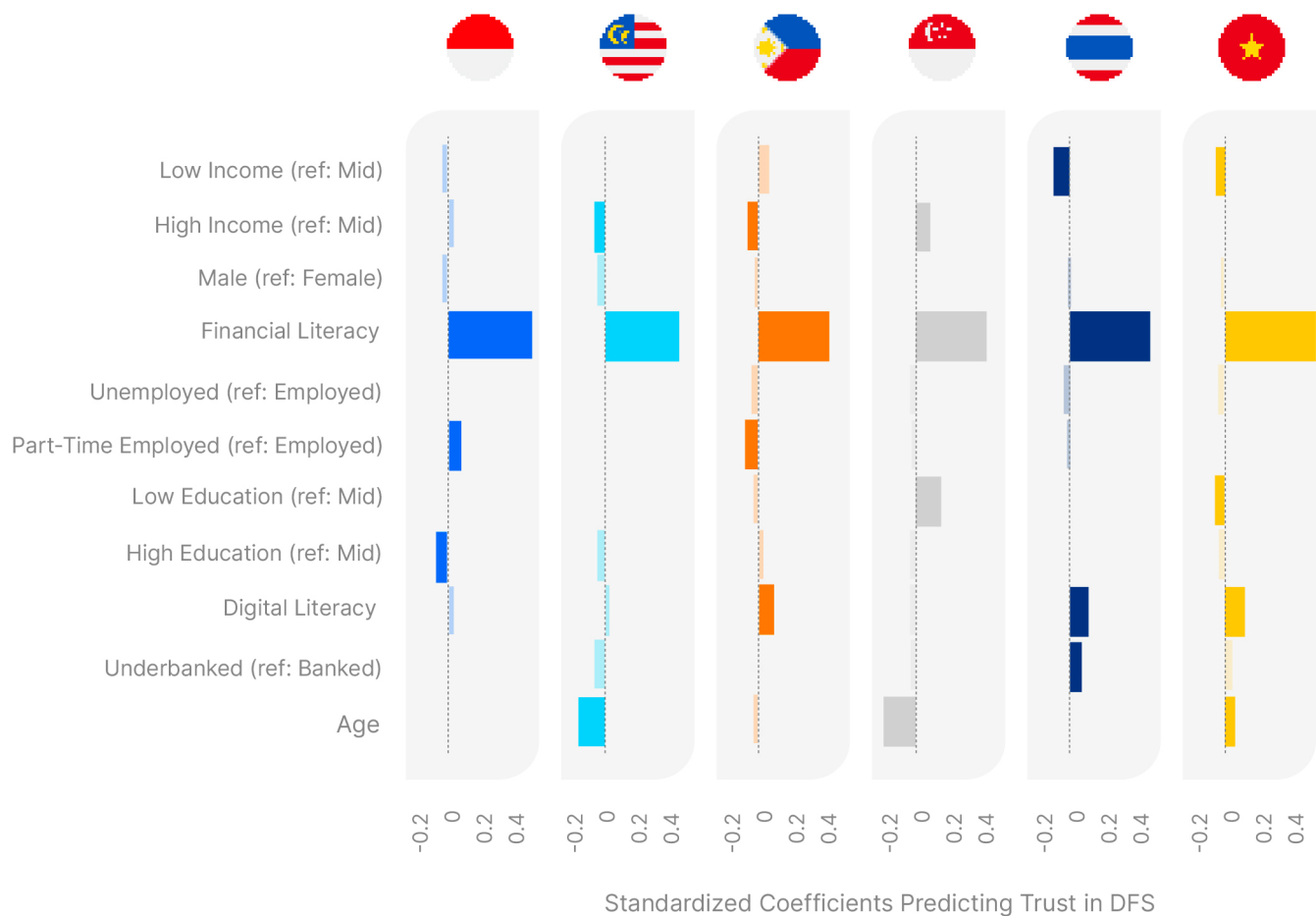
Figure 8: Factors predicting trust in DFS providers[58]

The role of financial literacy in DFS adoption also highlights the importance of ensuring equitable opportunities for financial literacy. This study finds that financial literacy levels correspond to household income levels in our respondents: households with higher levels of income have higher financial literacy levels whereas households with lower levels of income have lower financial literacy levels. Lower income households also tended to have lower education levels, higher unemployment rates and a higher proportion of unbanked/underbanked individuals, all of which serve as some of the barriers to financial literacy education and DFS usage. Refer to **Figure 9**.

Figure 9: Financial literacy and household income

Closing Gender Gap in Financial Literacy Is Important

Except for Indonesia, we find a statistically significant difference in financial literacy between genders. In Thailand and Vietnam, female respondents were found to have higher levels of financial literacy than male respondents, while the reverse was true of Malaysia, the Philippines and Singapore. Refer to **Figure 10**. Given the role of financial literacy in DFS adoption, it is vital to raise financial literacy levels in general, and close gaps in particular.

Taking into account that respondents of this study generally reside in urban areas with online access, closing gender gaps in financial literacy is even more important to citizens living in rural areas or have limited access to the internet, given the extensive literature on gender gaps in financial literacy across all countries in the world.[59]

financial literacy score

male   female   not significant
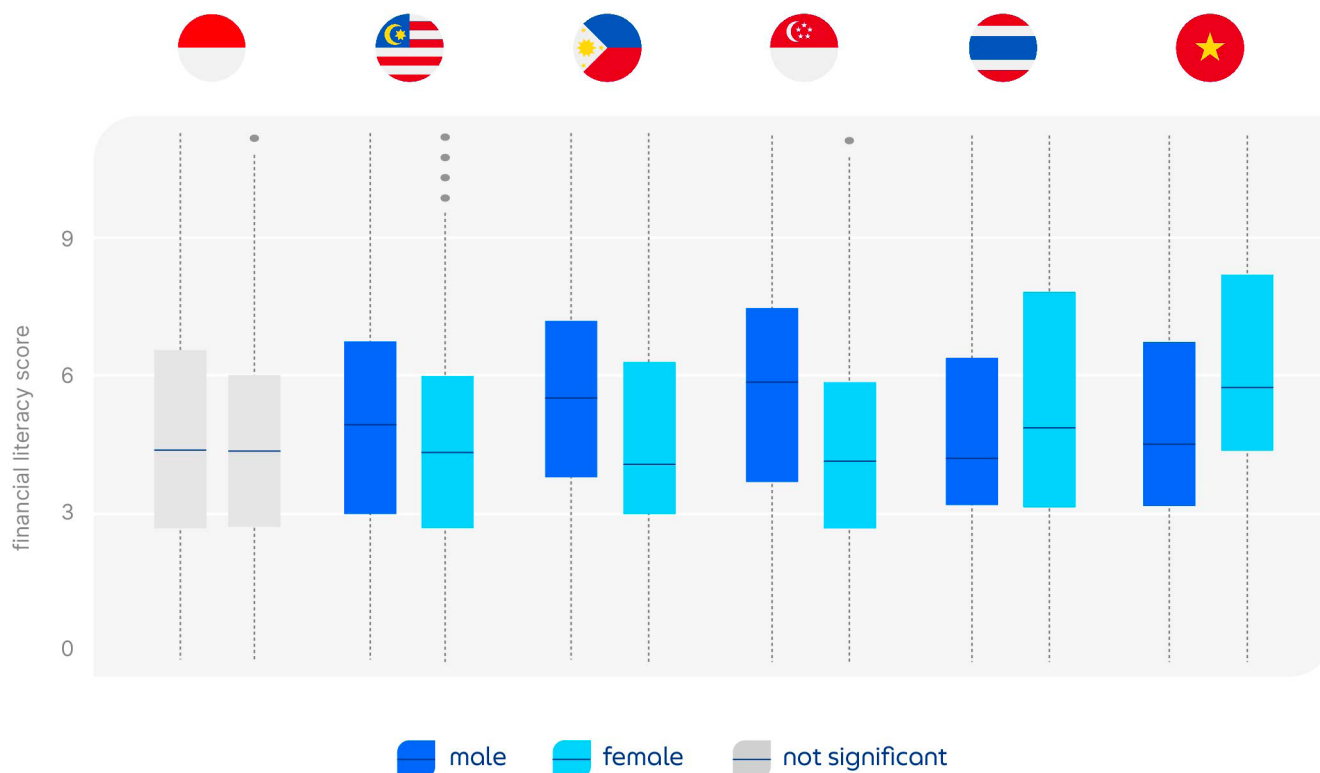
Figure 10: Financial literacy of males and females in SEA-6

The Role of Trust in Predicting DFS Product Usage

When put together in a model predicting product usage alongside socioeconomic, demographic, and financial and digital literacy variables, trust in DFS providers predicts DFS usage differently across the countries surveyed.

DFS providers

no DFS   e-wallet only

no DFS   e-wallet only
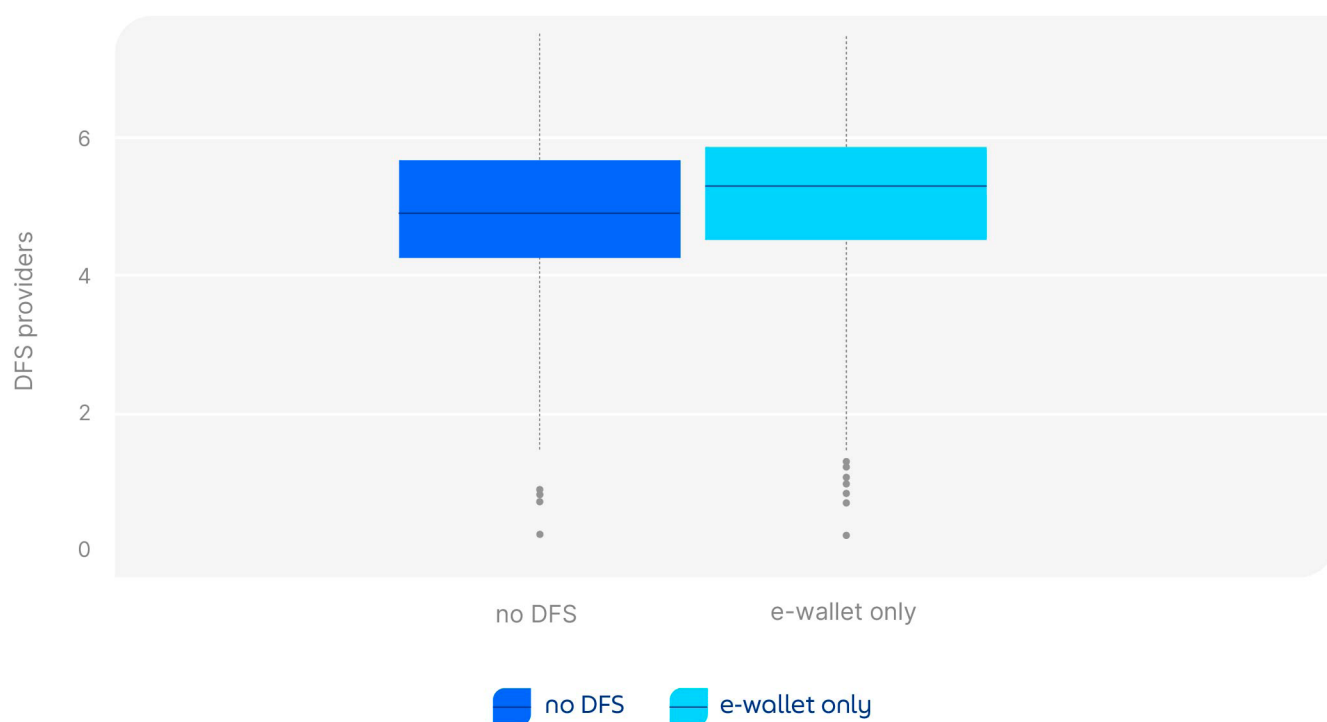
Figure 11: Comparing trust levels of respondents who only use e-wallets to non-DFS users

Trust in DFS providers positively predicts e-wallet usage in the Philippines, Singapore and Thailand but not in Indonesia, Malaysia and Vietnam. When it comes to non-e-wallet products, trust in DFS providers positively predicts usage in Malaysia and Singapore but negatively predicts usage in Thailand. Trust in providers is not a predictor of non-e-wallet usage in Indonesia, Philippines and Vietnam.

Observed results in Thailand contradict the results in Malaysia and Singapore. Trust in providers positively predicts e-wallet usage but negatively predicts non-e-wallet usage. The relationship between trust in providers and product usage is correlational in our model, which means that in the case of Thailand, higher trust is correlated with lower non-e-wallet product usage or lower trust is correlated with higher non-e-wallet product usage. A possible interpretation of this relationship is that the more consumers use non-e-wallet products, the less trust they have in providers.

Further research is required to better understand the result observed in Thailand. Hypotheses for the lower levels of trust among respondents using more non-e-wallet products suggest that user frustrations such unfriendly interfaces, poor customer service and security concerns may be contributing factors.
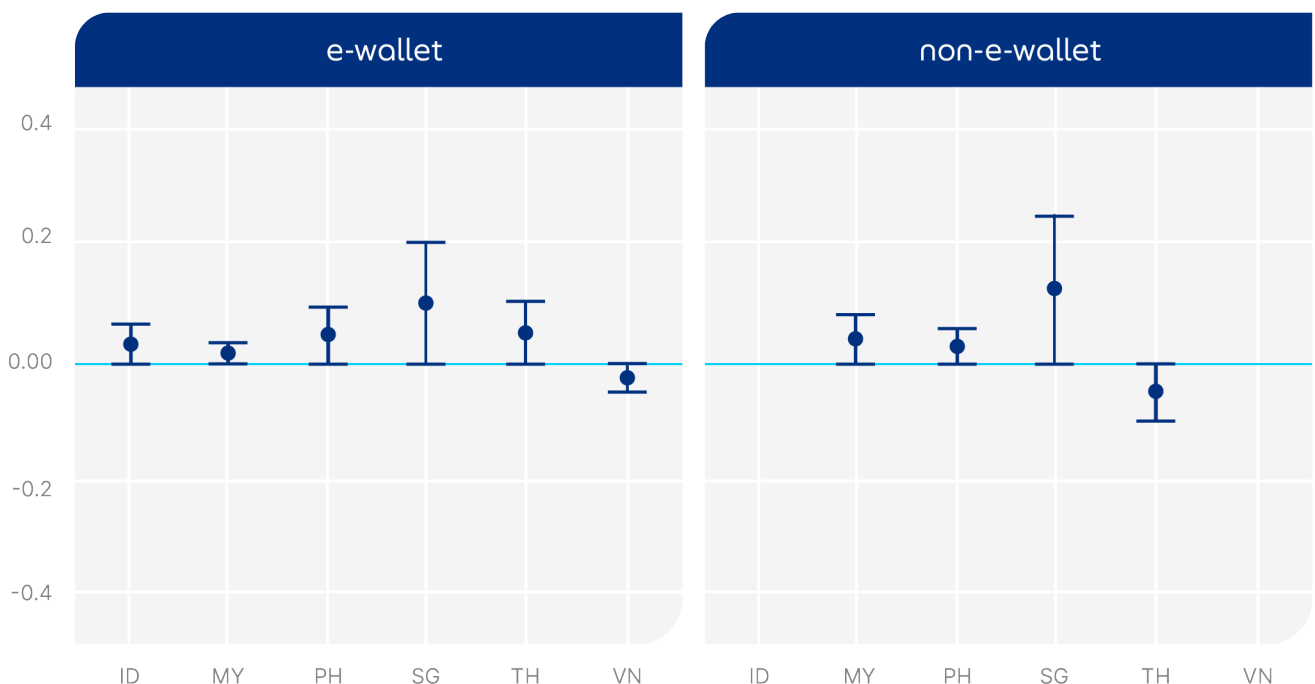
Figure 12: Trust in DFS providers predicts DFS usage differently across SEA-6

4.
Implications for Governments and Providers

Governments and providers can work together to realise the potential of DFS to accelerate financial inclusion.

↗ Build on Existing Trust

This study finds that respondents have high levels of trust in financial service providers — both banks and DFS providers — across SEA-6 countries. This is a solid foundation for the region's financial inclusion agenda and presents opportunities for both governments and providers to innovate and experiment with new products and services.

For the government, trust can act as ballast when balancing the dual needs of encouraging innovation and ensuring stability in the financial system. In engaging with providers, regulators can emphasise the importance of upholding trust through standards while encouraging innovation and a commitment to positively impact society through financial inclusion.

For incumbent banks, trustworthiness is important but insufficient to keep customers. Trust has great potential as a lever in the consumer acquisition and retention process.[60] Banks' experiences and the high barriers to entry into this industry can be coupled with agility in adopting digital technologies for financial inclusion.

DFS providers, on their own or in partnership with a bank, have the potential to earn more trust as they entrench their services into the lives of their consumers.

↗ Invest in Digital and Financial Literacy First

Digital literacy and financial literacy predict usage of DFS and trust in providers. Initiatives to improve financial literacy and digital literacy are especially important to further encourage confident usage — and by extension, financial inclusion — especially among more marginalised and vulnerable populations.

Efforts to improve digital and financial literacy should not exclusively focus on the unbanked, but also the underbanked to ensure that consumers have the knowledge to make more informed financial decisions and access to the full suite of DFS available.

For governments looking to advance financial inclusion, improving digital and financial literacy are crucial as they are the most significant predictors of DFS adoption. Cooperation with and between providers can foster digital and financial literacy among their respective target segments.

Microsoft, for example, partnered with Grab to make its Digital Literacy Certification Programme available to driver and delivery partners through the Grab app in Singapore, Malaysia, Philippines, Thailand and Cambodia. In one year, the programme reached nearly half a million[61] individuals.

↗ Consider Trust Alongside Demographic and Socioeconomic Factors for Financial Inclusion

Policies to improve financial inclusion should be comprehensive and encompass a variety of demographic and socioeconomic factors because they affect and interact with each other. While our study finds that trust in providers does not necessarily convert to actual usage of DFS in all countries – Indonesia and Vietnam in particular – it will still be useful to include trust in the equation for encouraging DFS usage and advancing financial inclusion.

Policymakers and providers in the region can regularly measure trust not only to assess the efficacy of their trust-building initiatives, but also to gain insights on gaps and opportunities to better leverage trust for DFS adoption. Both policymakers and DFS providers will also do well to attend to both sides of the trust equation: changing people's attitudes and mindsets as well as improving the trustworthiness of DFS through standards, frameworks and regulation.

By understanding how different antecedents predict trust in each country, precious resources can be deployed towards efforts most likely to have the most positive impact.

For providers looking to gain and retain their consumers, it is crucial to articulate and demonstrate their values repeatedly and consistently. Our study finds that consumers' positive perceptions of providers are more important than their attitudes towards technology. By understanding the unique factors contributing to trust in each country and for each segment of the population, providers can communicate more transparently to consumers, design more effective products and provide better user experiences.

Conclusion

The COVID-19 pandemic has accelerated the adoption of digital services and of DFS products as well. DFS has great potential to accelerate the growth of the digital economy and improve financial inclusion among the unbanked and underbanked in Southeast Asia. The respondents' high levels of trust in DFS providers suggests a solid foundation for the region's financial inclusion agenda.

Policymakers and providers need to work together to lower barriers to financial inclusion through DFS, as a cornerstone of a safe and trustworthy digital ecosystem. Investing in digital literacy and financial literacy are critical to ensure that citizens may fully benefit from what DFS can offer.

Yet, there is no single playbook to increase DFS usage and trust across the region. Policymakers and providers should customise initiatives to encourage confident adoption, for efficient use of resources for maximum impact.

Annex: Methodology

Measuring DFS Adoption

To gain a better understanding of the factors influencing DFS usage at the individual level in Southeast Asia, we have posed the following research questions:

1. **What are the factors predicting the usage of DFS?**

2. **To what extent do people trust DFS providers and what role does trust play in the usage of DFS?**

3. **What is the relationship among digital literacy, financial literacy and trust? How do they predict the usage of DFS?**

We have conducted an online survey in November 2021 in six countries — Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam — across 6,000 respondents or approximately 1,000 from each country. The nature of an online survey means that all participating respondents have access to the internet and/or computers.

The survey questions are designed to assess respondents' experiences with and perceptions of financial services providers. Respondents are provided with a list of statements relevant to banks and DFS providers and were asked to rate their agreement levels with each of the statements on a 7-point Likert scale.

The survey also includes questions pertaining to respondents' sociodemographic background covering their banking status, income levels, employment status, education levels, age, gender, financial literacy levels and digital literacy levels.

Sampling

The survey is curated by Nielsen in November 2021 using their online panel, which meant that all 6000 respondents have access to the internet. Hence, while representative of the online populations of the six countries surveyed, demographic characteristics of the sample population differ from those of the general populations in the countries. Separately, we have ensured that a minimum number of unbanked/underbanked respondents are represented in the survey to ensure that the findings of the study are not completely irrelevant for these segments of the population in the region.

Geographical breakdown: With the exception of Singapore, the survey has targeted individuals living in different cities in their respective countries. Refer to **Figures 13 to 17** for the geographical breakdown of each country.

Indonesia

27.14% Jakarta	14.57% Others (Indonesia)	10.35% Bandung	7.64% Medan
		6.43% Semarang	3.42% Yogyakarta / 2.91% Bogor
			2.61% Depok / 2.61% Makassar / 2.61% Palembang
	10.25% Surabaya	4.32% Tanggerang	2.61% Bekasi / 1.61% Bali (Denpasar) / 0.80% Bali (Other Cities)

Figure 13: Geographical breakdown of survey respondents in Indonesia

Malaysia

40.96% Kiang Valley	14.76% Others (Malaysia)	12.85% Johor	
		5.72% Kota Kinabalu	4.02% Melaka
	12.95% Penang	4.82% Ipoh	3.92% Kuching
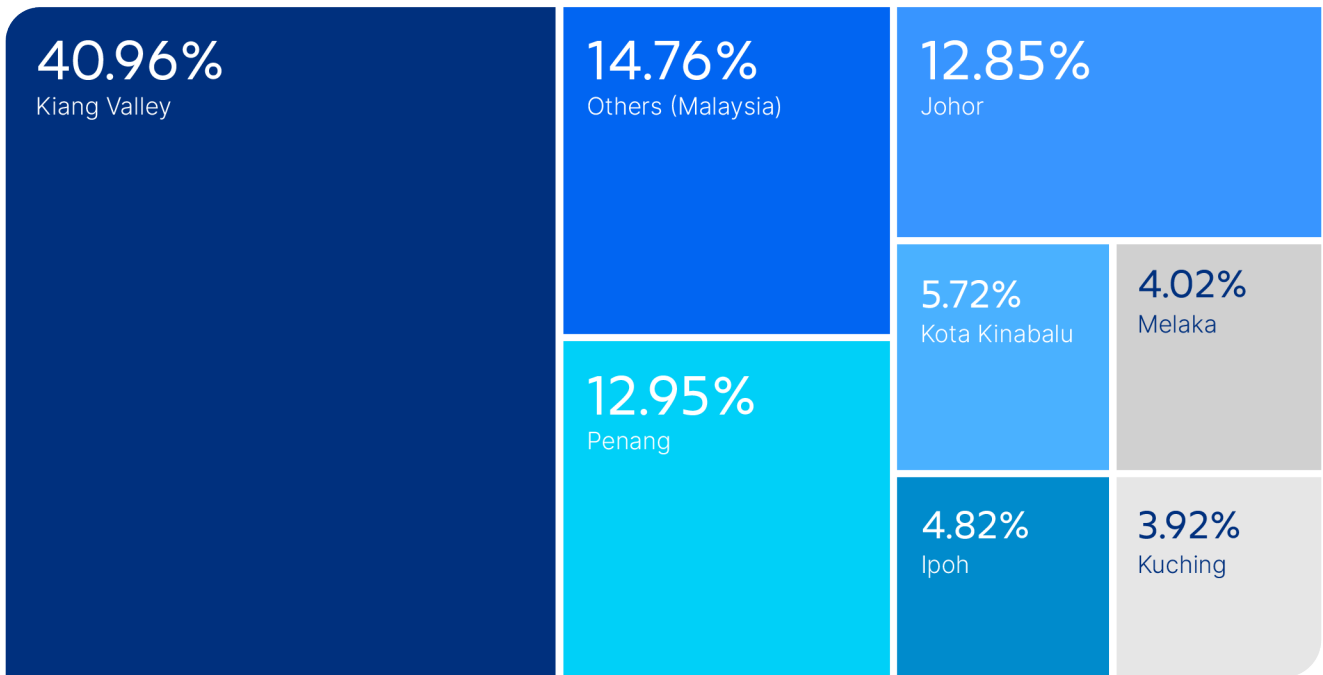
Figure 14: Geographical breakdown of survey respondents in Malaysia

The Philippines
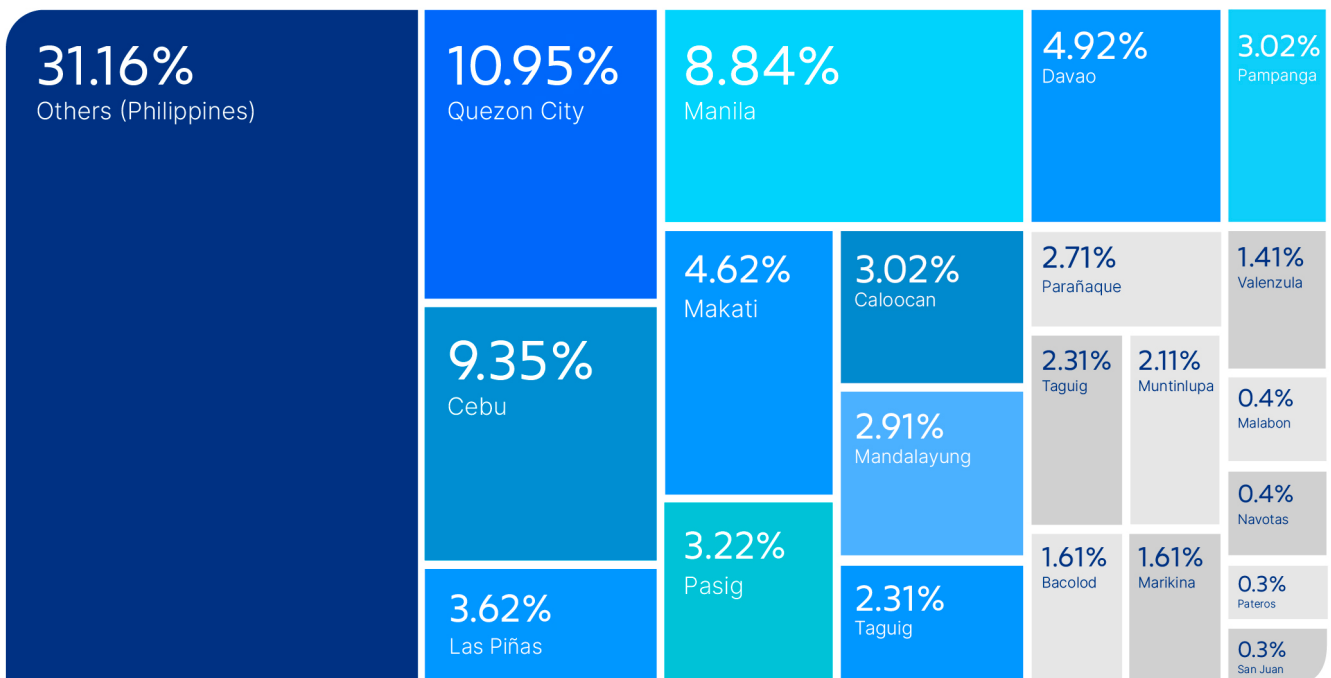
Figure 15: Geographical breakdown of survey respondents in the Philippines

Thailand

43.09% Bangkok		

8.92% Others (Thailand)

4.01% Samut Prakan

3.91% Chonbury

2.1% Pathum Thani

1.9% Udon Thanit

2.81% Khon Kaen

1.7% Ubon Ratchathani

1.6% Nakhon Pathom

1.3% Phuket

6.51% Chiang Mai

1.61% Marikina

1.4% Samut Sakhon

1.4% Surat Thani

2.2% Hatyai

1.5% Korat

1% Roi Et

0.8% Buri Ram

0.6% Kanchanaburi

0.6% Rayong

4.41% Nonthaburi

2.1% Nakhon Si Thammara

1.1% Chiangrai

1% Lampang

0.7% Ayutthaya

0.4% Hua Hin

0.4% Chanthaburi

0.2% Uttaradit

0.6% Phetchaburi

0.3% Maha Sarakham

0.7% Phitsanulok

0.3% Nakhon Sawan

0.1% Chaiyaphum

0.3% Chumphon

Figure 16: Geographical breakdown of survey respondents in Thailand

Vietnam

52.36% Ho Chi Minh

35.98% Hanoi

8.04% Others (Vietnam)

2.71% Danang

1.91% Hai Phong
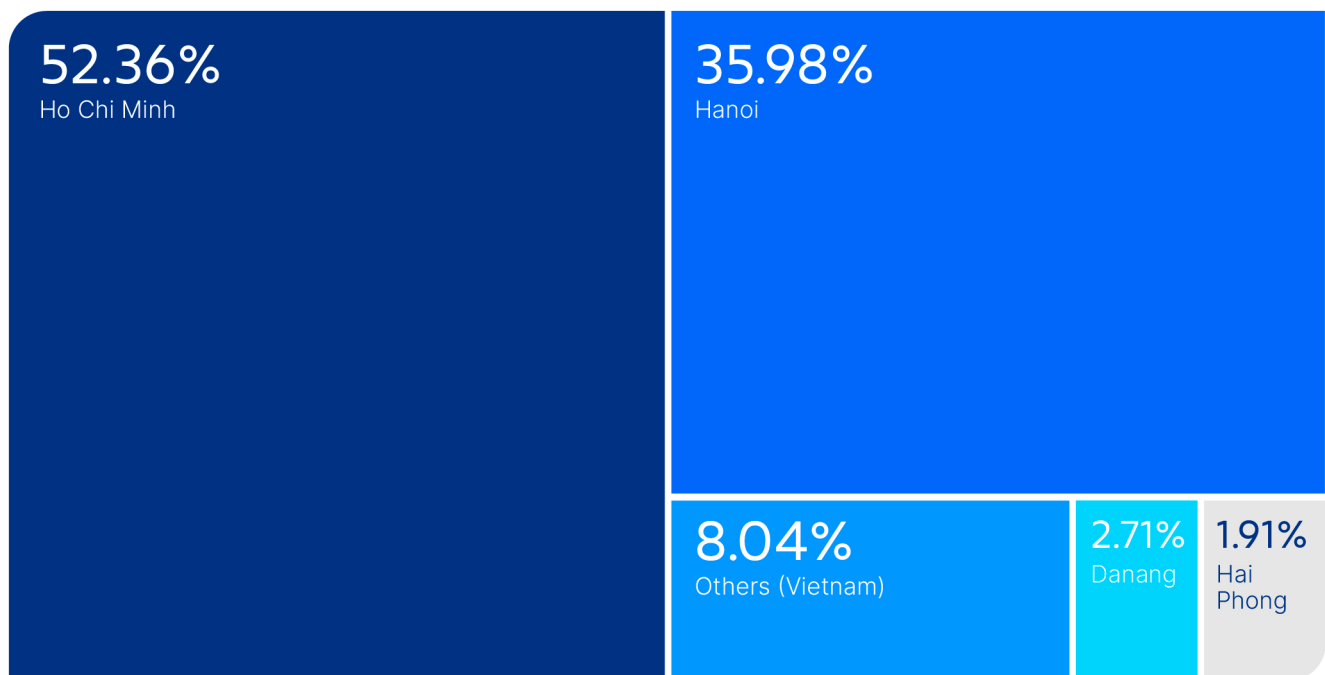
Figure 17: Geographical breakdown of survey respondents in Vietnam

Bank status: The survey is stratified to include, on average, 29% of unbanked or underbanked individuals. In actual populations, 65% of the population is either banked or underbanked on average in the six countries. Table 1 below shows the differences between sample and actual populations in the six individual countries.

Table 1. Percentages of unbanked or underbanked individuals in sample population vs. actual population in SEA-6

% Unbanked or underbanked		
	Sample	Population[62]
Indonesia	30%	76%
Malaysia	27%	55%
Philippines	30%	78%
Singapore	26%	40%
Thailand	29%	63%
Vietnam	30%	79%

Income distribution: Sample income distribution differs from actual income distribution but the general trends are similar. For example, the comparisons between sample and actual income distribution for Vietnam[63] are as follows:
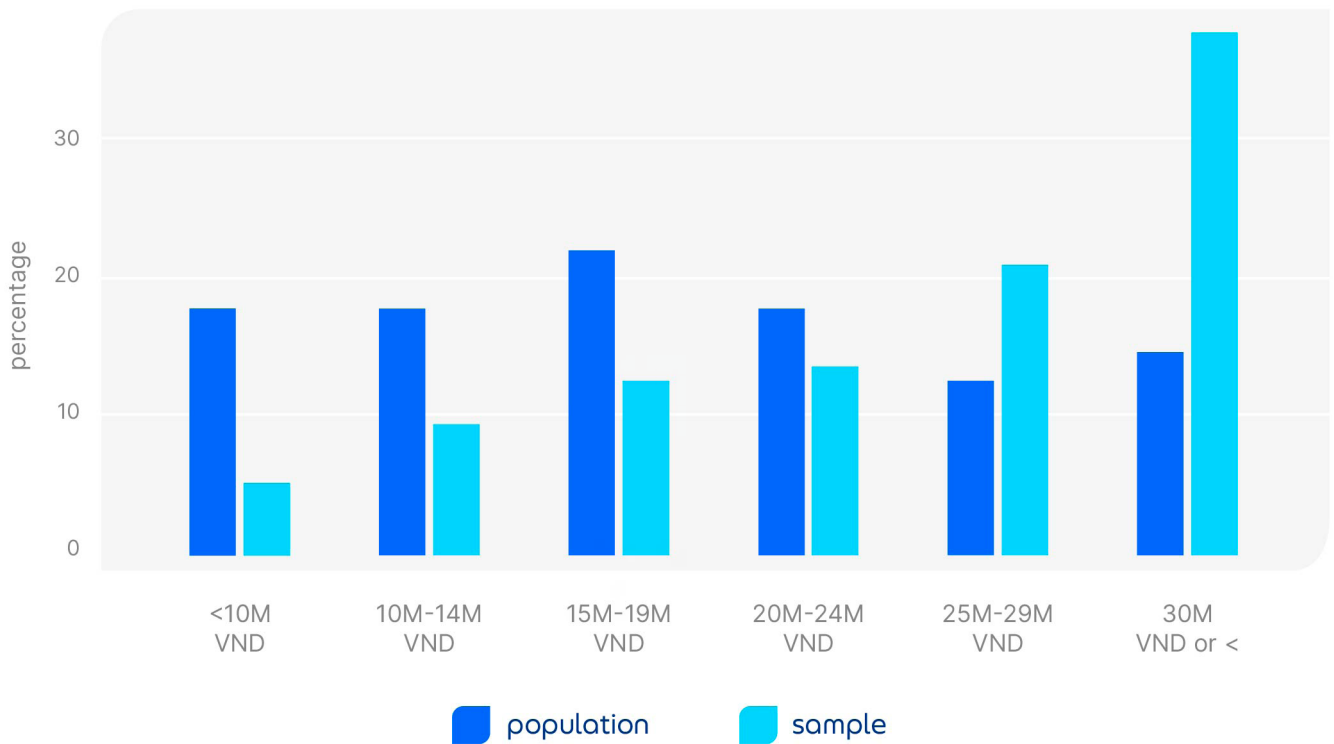
Figure 18: Sample vs. actual income distribution in Vietnam

Digital Literacy

Following prior work, we measured digital literacy by collecting respondents' usage frequency of digital devices and reliance on the internet.[64] Respondents are asked if they use devices like smartphones, tablets and desktop/laptop, and the frequency with which they use them. A score of 1 is assigned to a response of "a few times a day", 0.5 for "daily" and 0 for the rest ("a few times a week", "once a week", "once a month" and "less than once a month"). Respondents are also asked the purpose of their internet usage to assess if they rely heavily on digital devices to carry out daily tasks and activities. Options include learning, doing business, working, emailing, general web surfing, social media and electronic banking. A score of 0.5 was assigned to each task or activity. The highest possible score is 9 and a higher score indicates a higher level of digital literacy and vice versa. Refer to **Figure 19**.

Figure 19: Digital literacy levels of respondents

Financial Literacy

We use OECD's measure of financial literacy.[65] Specifically, respondents are asked if they are comfortable explaining the functioning of various products including savings deposits, bank loans, credit cards, housing loans, insurance, stocks and shares, and bonds. A score of 1 was assigned to a response of "very comfortable", 0.5 for "somewhat comfortable" and 0 for the rest ("neutral", "somewhat uncomfortable" and "very uncomfortable"). Respondents are also asked to respond to four statements designed to assess their financial knowledge, indicating if each of the statements is true or false or if they do not know the answer ("don't know"). A score of 1 is then assigned to correct responses and a score of 0 for incorrect responses and those whose answers are "don't know". The scores are then added up for each respondent. The highest possible score is 11 and a higher score indicates a higher level of financial literacy and vice versa. Refer to **Figure 20**.
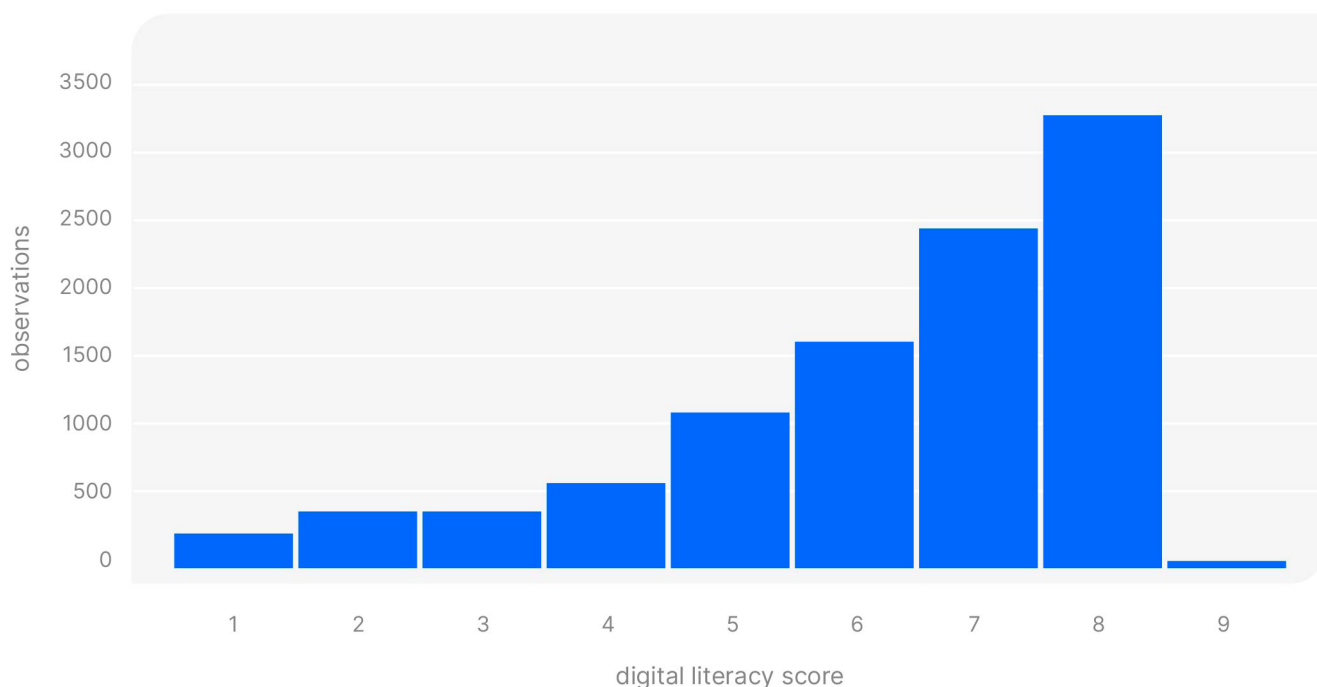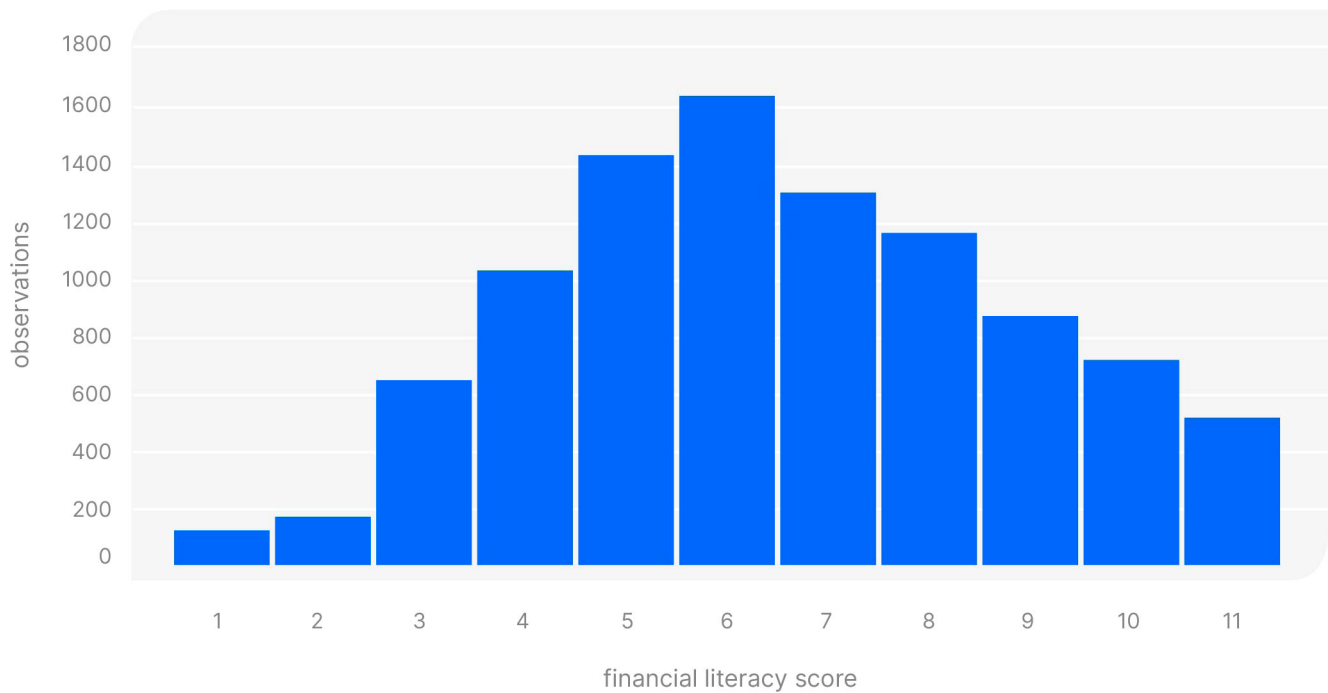
Figure 20: Financial literacy levels of respondents

Trust

The constructs of *trust, competence, communication, reputation, integrity and propensity to trust technology* are regarded as latent variables in the study and are measured by the respective items used in the questionnaire as shown in Table 2 below. Responses are collected on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Table 2. Constructs and the items used in the survey

Construct	Context	Item 1	Item 2	Item 3	Item 4
Competence	DFS	Digital financial service providers competently handle all their customers' requests	Digital financial service providers are efficient	Digital financial service providers are knowledgeable	Digital financial service providers are successful at what they do
Communication	DFS	Digital financial service providers are responsive when contacted	Digital financial service providers keep their customers informed of new products and services	Digital financial service providers communicate expectations for their business/ product performance in great detail	Digital financial service providers openly communicate the way they conduct their business

Integrity	DFS	Digital financial service providers have a strong sense of justice	Sound principles seem to guide digital financial service providers' behaviour	Digital financial service providers demonstrate high integrity	
Reputation	DFS	Digital financial service providers are highly regarded in the financial services industry	Digital financial service providers have a good reputation in the financial services industry	Digital financial service providers are known to be some of the most capable firms in the financial services industry	
Trust	DFS	Digital financial service providers have a reputation for being dependable	Digital financial service providers are reliable	Digital financial service providers can be counted on to do what they say they will do for their customers	Given digital financial service providers' track record, I have no reason to doubt their reliability
		Digital financial service providers are always honest with their customers	Digital financial service providers are concerned about the best interests of their customers	Digital financial service providers are warm and caring toward their customers	Digital financial service providers can be counted on to listen to their customers' problems
Propensity to Trust	Technology	I believe that most technologies are effective at what they are designed to do	A large majority of technologies are excellent	Most technologies have the features needed to do the job they are designed to do	I think most technologies enable me to do what I need to do
Competence	Banks	Banks competently handle all their customers' requests	Banks are efficient	Banks are knowledgeable	Banks are successful at what they do
Communication	Banks	Banks are responsive when contacted	Banks keep their customers informed of new products and services	Banks communicate expectations for their business/ product performance in great detail	Banks openly communicate the way they conduct their business

Integrity	Banks	Banks have a strong sense of justice	Sound principles seem to guide banks' behaviour	Banks show high integrity	
Reputation	Banks	Banks are highly regarded in the financial services industry	Banks have a good reputation in the financial services industry	Banks are known to be some of the most capable firms in the financial services industry	
Trust	Banks	Banks have a reputation for being dependable	Banks are reliable	Banks can be counted on to do what they say they will do for their customers	Given banks' track record, I have no reason to doubt their reliability
		Banks are always honest with their customers	Banks are concerned about the best interests of their customers	Banks are warm and caring toward their customers	Banks can be counted on to listen to their customers' problems

Structural Equation Modelling (SEM) approach is used to model the relationship between trust and other variables as this methodology allows researchers to investigate the relationships between latent variables and individually quantify the importance of the various antecedents.[66]

Individual confirmatory factor analysis (CFA) is performed for each of the 11 constructs for each of the six countries. For example, a CFA for the construct of competence is conducted on four items for the sample from Indonesia. All CFA's utilise the robust maximum likelihood estimator (or "MLM" in lavaan) and fix the unstandardized factor loading of the first item to one for scaling purposes. All CFA models demonstrate extremely good fit. The comparative fix index (CFI) ranges from 0.92 to 1.00, Tucker-Lewis index (TLI) ranges from 0.88 to 1.00 (only 1 out of 66 models had a TLI below 0.90), root mean square error of approximation (RMSEA) ranges from 0.00 to 0.16 (only 10 out of 66 models had a RMSEA above 0.08) and standardised root mean square residual (SRMR) ranged from 0.00 to 0.05. Cronbach's alphas range from 0.85 to 0.96.

After determining that the individual measurement model of each construct has acceptable fit with the data, then testing the measurement invariance of each construct between the context (DFS or banks), countries and the bank status of the respondents follow.

Measurement Invariance

The research project's two most important categorical variables are *Country* and *Banked Status*. *Banked Status*, which can take three levels — banked, underbanked and unbanked. We collapse the categories of underbanked and unbanked into one category of "underbanked" as there is an extremely low frequency of unbanked. As we also wish to make comparisons between DFS and banks on the constructs, we also evaluate whether the measurement of the constructs are invariant across the context of DFS and banks. Thus, crossing *country* with the collapsed *banked status* and the context of DFS or banks, we arrive at (6 x 2 x 2) 24 groups. Measurement invariance for each of the constructs (except for propensity to trust) is evaluated between these 24 groups. Measurement invariance is tested by sequentially testing nested models, starting from a multiple-group CFA without any parameter constraints. If acceptable fit indices are obtained, we conclude the presence of configural invariance. We define acceptable fit indices by referencing Hu and Bentler (1999), which suggest a CFI greater than 0.95, TLI greater than 0.95, RMSEA smaller than 0.06 and SRMR less than 0.08. As long as at least two of these four alternative fit indices pass the threshold, we will consider the configural model a good fit and move on to test the higher levels of invariance. Secondly, we impose equality constraints on all factor loadings across groups, if the fit does not significantly decrease, we conclude the presence of metric invariance. Thirdly, we impose equality constraints on the item intercepts across groups. If acceptable fit indices are obtained, we conclude the presence of scalar invariance. Following Cheung and Rensvold (2002), we then evaluate whether a decrease in fit is significant using a criteria of less than -0.01 change in CFI.

The measurement invariance test reveal that all of the constructs except for *integrity* and *trust* attain at least scalar invariance. Since the *propensity to trust (technology)* construct does not belong to either the context of DFS or banks, measurement invariance is assessed with (6 X 2) 12 groups from crossing *country* and *banked Status*. *Propensity to trust (technology)* is able to attain scalar invariance as well. *Integrity* is only able to achieve metric invariance, which allows the use of the construct in modelling correlational relationships, but precludes from making meaningful comparisons of the means of the latent construct across countries and across banked status. Regarding *trust*, we find clear evidence of metric invariance but it fails the test of scalar invariance by a miniscule amount. We find a decrease in CFI of -0.01 in CFI; the criterion allows for a decrease less than -0.01. The team decides to allow trust to pass scalar invariance as well since the difference in threshold is miniscule.

Regarding *trust*, we found clear evidence of metric invariance but found that it had failed the test of scalar invariance by a miniscule amount. We found a decrease in CFI of -0.010 while the criteria was that the decrease was **less than** -0.010. The team discussed this over and decided to allow trust to pass scalar invariance as well since the difference in threshold was miniscule.

Common Method Variance

Common method bias is the observation that the analysis is biased because the data collected employed only one method of data collection. The bias is caused by the existence of the common method variance (CMV), which is variance that is shared between variables simply because they were collected with the same method. Richardson, Simmering and Sturman (2009) finds that existing post-hoc methods are not effective in correcting for such bias and recommends a test for the presence of CMV using the CFA latent marker approach.

We adopt the procedure of the CFA latent marker approach from Williams, Hartman and Cavazotte (2010), and fit two models (baseline and method C model) to test for the presence of CMV in each country. We have selected our marker variable to be the question "How many people are in your household?" Responses to this question are collected in the form of categorical responses: "I am staying alone," "2 people,"... "10 people," and "More than 10 people," for a total of 11 response categories (converted to numeric scores of 1 to 11). This question is chosen as the marker variable as it demonstrates a low Spearman correlation with our subscale items, is deemed to be theoretically irrelevant to the constructs measured, and allows respondents to respond by choosing a category, similar to the scale items. The average Spearman correlation between the marker and the 48 items measuring our constructs is 0.083, which is one of the lowest average correlations found in the data. As we have a single-marker-indicator, we adopt the approach in Simmering, Fuller, Richardson and Atinc (2015) where we assume a reliability coefficient of 0.9 and fit a single indicator latent factor by fixing the factor loading to the square root of 0.9 and the error variance of the indicator to the product of one minus the reliability coefficient and the variance of the item.

To test for the presence of CMV, we fit a general measurement containing all constructs in each country along with an additional latent factor (marker factor) that only has factor loadings on the marker variable, while all other factors load onto their respective items. The marker factor is constrained to be independent of the other constructs to identify the model, this will be referred to as the baseline model. Next, we fit a similar model but we allow the marker factor to load onto all 48 items in the model, in addition to loading on the marker variable. Factor loadings of the marker factor on substantive items are constrained to be equal. This model is referred to as the method C model and is displayed in Figure 20. Model comparisons using the difference in chi-square between baseline and method C model for each country is summarised in Table 3. For Vietnam, the construct of integrity (bank) is removed as high correlations with cognitive trust caused the model to not converge.

Table 3. Change in average variance explained (R2) and the chi-square differences between the baseline and method C models. Values were calculated taking baseline - method C, such that the differences are interpreted as the change when the effect of CMV was constrained to zero.

Country	Change in Average R2	Chi-Square Difference	p-value
Indonesia	Less than 0.001 decrease	0.560	0.454
Malaysia	Less than 0.001 decrease	0.276	0.600
Thailand	-0.001	4.32	0.038*
Philippines	Less than 0.001 decrease	0.179	0.672
Singapore	Less than 0.001 decrease	4.289	0.038*
Vietnam (No Bank Integrity)	Less than 0.001 decrease	5.338	0.021*

The chi-square difference test provides evidence that CMV is present in Thailand, Singapore and Vietnam. However, the chi-square differences test is biased to give significant results even with small misfits in larger samples and we look at the change in item variance explained as well (R^2 or R squared). We find that for all countries, constraining the marker factor to have zero factor loading with the substantive items decreased the variance explained by at most 0.1% (Thailand). Considering this, we interpret this as evidence against the presence of CMV in our data. Following the recommendation of Richardson, Simmering and Sturman (2009), we do not include the marker variable in subsequent analysis as it is shown that doing so produced more biased results compared to leaving CMV unaccounted for.
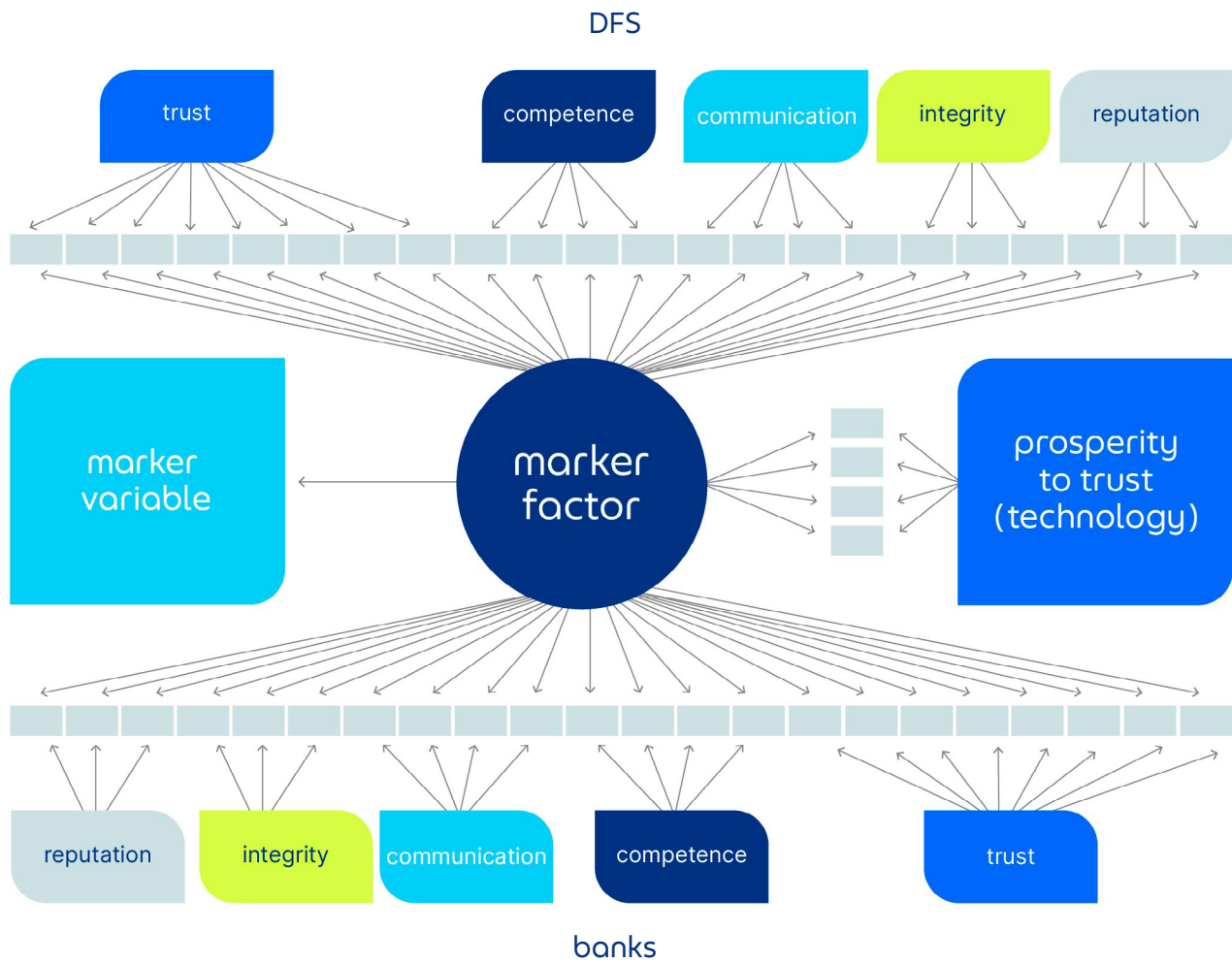
Figure 21. Marker Model. Correlations between latent variables were omitted in the diagram.

General Measurement Model

The general measurement model consists of all constructs measured by their respective items and all constructs were allowed to correlate with each other. A general measurement model is fitted in each country. There are extremely strong correlations between some latent factors in some countries. Tables 4, 5, 6 and 7 display the constructs with correlations greater than 0.95. There are three hypotheses for the source of these high correlations: a) these reflect the strong conceptual and real relationships between the constructs; b) it can be indicative of the lack of distinctness of the constructs; or c) it can suggest that there is strong common method bias in the survey respondents. We can eliminate the third hypothesis as the measurement models have already accounted for common method variance. Thus, we are left between two explanations for the high correlations: a) these reflect the strong conceptual and real relationships between the constructs; and b) it could be indicative of the lack of distinctness of the constructs.

Lastly, we fit the general measurement model to the dataset containing all respondents from all six countries in a multiple group CFA. Factor loadings and intercepts for all constructs except for integrity are constrained to be equal across all six countries. Only the factor loadings for integrity are constrained to be equal across all six countries and the intercepts were freed. Model fit is good: CFI is 0.952, TLI is 0.950, RMSEA is 0.045 and SRMR is 0.031. Standardised factor loadings for all factors were above 0.7 and correlations between latent variables ranged from 0.53 to 0.975.

Table 4. Latent factors with correlation >0.95 in Malaysia

Latent Factors			Correlation
trust_DFS	~~	integrity_DFS	0.961

Table 5. Latent factors with correlation >0.95 in Singapore

Latent Factors			Correlation
trust_DFS	~~	integrity_DFS	0.966
integrity_DFS	~~	reputation_DFS	0.956
integrity_banks	~~	trust_banks	0.955

Table 6. Latent factors with correlation >0.95 in Thailand

Latent Factors			Correlation
integrity_banks	~~	trust_banks	0.974
trust_DFS	~~	integrity_DFS	0.954
competence_banks	~~	trust_banks	0.954
trust_DFS	~~	communication_DFS	0.953

Table 7. Latent factors with correlation >0.95 in Malaysia

Latent Factors			Correlation
communication_banks	~~	trust_banks	0.964
integrity_banks	~~	trust_banks	0.962
trust_DFS	~~	competence_DFS	0.951
trust_DFS	~~	integrity_DFS	0.950

Structural Equation Modelling

After ascertaining that the measurement models are satisfactory, we move on to include structural paths between latent constructs to answer the research questions of interest using structural equation modelling (SEM). Three main models of interest are analysed and detailed below.

↗ Comparison Of Trust Levels

We compare average trust levels within the framework of SEM using multiple group analysis across the six countries. Factor loadings and intercepts are constrained to be equal across countries. The SEM model consists of two latent factors — trust in DFS providers and trust in banks — measured by their corresponding items. We define the regional average level of trust in DFS as the simple average of the average trust levels of each country, likewise for trust in banks. The difference between the regional average of trust in DFS and trust in banks is tested as a defined effect. Normal maximum likelihood is used as the estimator and bootstrapped standard errors using 1000 iterations were requested.

↗ Demographic Variables and Trust Levels

The effect of demographic variables on trust is also tested within multiple group SEM. Factor loadings and intercepts are constrained to be equal across countries. The SEM model consists of two latent factors, trust in DFS and trust in banks, measured by their corresponding items. The demographic variables are modelled as the predictors of trust levels in both DFS and banks in the model. The demographic variables used in the analysis are detailed in Table 8 below.

Table 8. Demographic variables and dummy codes

Variable	Categories	Description	Reference Group
Gender	Male		Male
	Female		
Education Level	Low		Mid
	Mid		
	High		
Monthly Household Income	Low		Mid
	Mid		
	High		
Employment Status	Full-time		Full-time
	Part-time		
	Unemployed		
Banked Status	Banked		Banked
	Underbanked		
Age	Continuous		-
Financial Literacy	Continuous		-
Digital Literacy	Continuous		-

Trust and Antecedents

The trust model is also analysed within the multiple group SEM framework, where communication, competence, integrity, reputation and propensity to trust technology are posited as predictors of trust. Trust, in turn, was a predictor of product usage. Two separate models are fitted, one for trust in DFS and DFS product usage, and the other for trust in banks and bank product usage. All constructs are modelled as latent variables, measured by their respective items as in Table 2. The demographic variables (except for banked status) from Table 8 are also included in the analysis as predictors of trust and product usage. All factor loadings and intercepts for all constructs except for integrity are constrained to be equal across all six countries. Only the factor loadings for integrity are constrained to be equal across all six countries and the intercepts are freed.

For the analysis of the context of banks, robust maximum likelihood estimation is used and robust standard errors are requested.[67] The path diagram in Figure 22 illustrates the model that is fit for banks.

Figure 22. Structural Model for trust and antecedents (banks). Indicators and correlations between latent variables were omitted in the diagram. As there were a large number of demographic variables, we collapsed them into "demographic controls" in the diagram, the individual demographic variables were included in the actual analysis.

For the analysis of the context of DFS, product usage is split into two separate variables, where one variable is a binary indicator of whether the respondents used e-wallets and the other variable is a count indicator of non e-wallet products (i.e., the total number of insurance, investment and loan products used). The variables are split this way because of the differences observed between usage rates in the products. For example, e-wallets are used by a majority but insurance, investment and loan products are not. We use the weighted least squares with mean and variance adjustment (WLSMV) and robust standard errors are requested to account for the binary indicator.[68] The path diagram below illustrates the model that was fit for DFS.
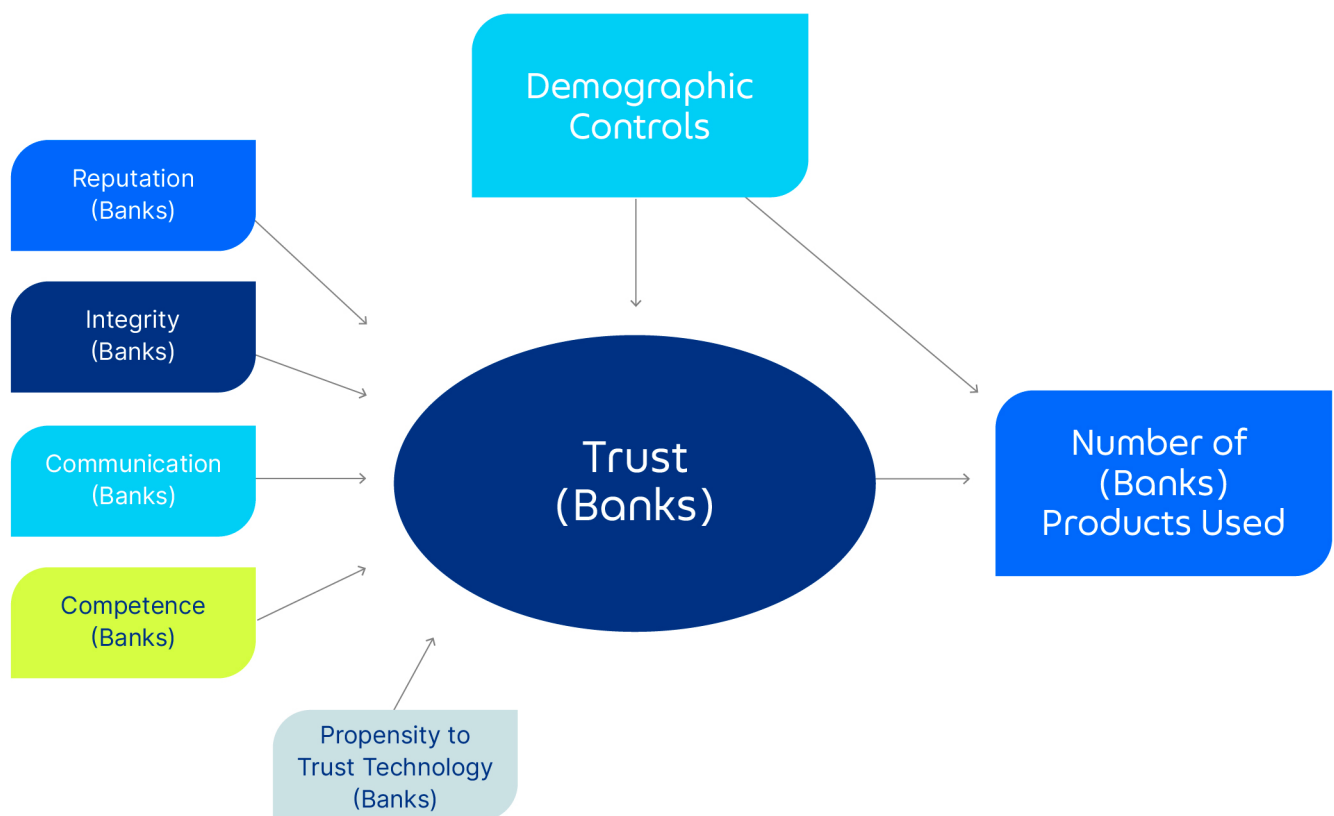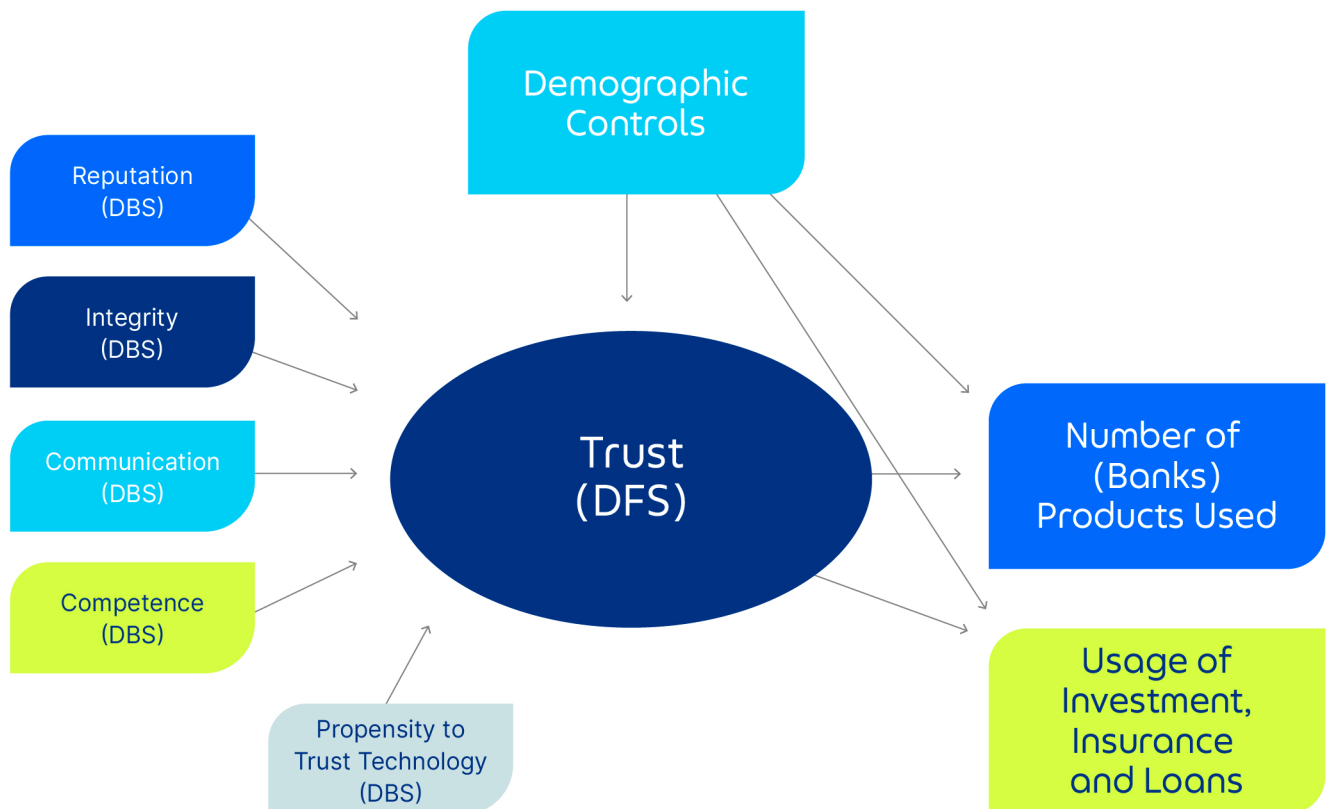

Figure 23. Structural model for trust and antecedents (DFS). Indicators and correlations between latent variables were omitted in the diagram. As there were a large number of demographic variables, we collapsed them into "demographic controls" in the diagram, the individual demographic variables were included in the actual analysis.

Limitations and Opportunities for Future Research

This investigation into the drivers of DFS usage purposefully examines socioeconomic factors, and stops short of broader economic or other considerations. Specifically pertaining to the role of trust in DFS usage, research surveying the relationship between consumer trust (i.e., as a result of the direct relationship between individuals and institutions) and system trust (i.e., trust in the contexts or environments where these institutions operate) can be found in Grayson et al[69]. The researchers find that consumer trust is positively influenced by system trust and it is a necessary mediator of the latter (positive association between system trust and consumer attitudes and behaviours). Although outside the scope of our research, this could be a viable line of inquiry in Southeast Asia for future research.

Attitudes and intention are not always strong predictors of behaviours, and there may exist an 'intention-action gap.'[70] In simple language, just because someone has demonstrated positive attitudes toward, or higher trust in DFS, or has expressed the intention to use DFS, does not mean that they will actually use DFS. There are many structural or psychological barriers that may be preventing individuals from taking action. Future research could explore the different barriers contributing to this intention-action gap to cultivate a better understanding of how different factors interact with the final decision to adopt and use DFS. This can help governments in the region improve financial inclusion by lowering the barriers to actual adoption and making DFS more accessible for everyone.

Both policymakers and DFS providers should look beyond the sample studied here to understand how trust interacts with DFS among the entire population of the countries studied. Respondent profiles in this study do not capture the full diversity of users in all countries as the sample is not representative of each country's entire population. Specifically, our results here do not tell us anything about those who are not yet online and we may expect results to be different for those who do not have regular internet connections, who live in rural areas, who have lower income and who have much lower DFS use rates than the population studied here. These differences may drive different results and yield additional insights, for example relevant to those connecting to digital financial services for the first time. The results from this study can serve as a point of reference and comparison for efforts to better understand the drivers and barriers to DFS usage at the base of the pyramid in the region.

Finally, this analysis examines the use of DFS by counting the self-reported number of services that respondents have used, but does not consider other aspects of use. Specifically, the purpose for which DFS are used, the frequency of use, or the relative amount of money channelled through DFS are all important in understanding product usage. In relation, factors related to the decision to stop using DFS or choosing to use DFS only for specific purposes are also not covered in this study. Factors that motivate or inhibit the ways users use DFS are an area of investigation for future research.
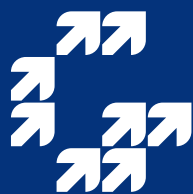
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