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**Working Paper**

## Fintech, financial literacy, and consumer saving and borrowing: The case of Thailand

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**ADB Working Paper Series**

**FINTECH, FINANCIAL LITERACY,  
AND CONSUMER SAVING  
AND BORROWING: THE CASE  
OF THAILAND**

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No. 1100  
March 2020

**Asian Development Bank Institute**

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**Abstract**

Financial services in Thailand are undergoing rapid transformation. The adoption of digital payments has been growing at an exponential rate, thanks to various collaborative initiatives between the public and private sectors, as well as competition between financial services providers themselves. In the future, with mobile banking penetration reaching a critical level, competition for digital savings and borrowing products is also expected to be fierce. Although financial technology (FinTech) is expected to promote financial inclusion, and encourage better financial literacy, many challenges remain. This paper first reviews the results from the Thai Households Financial Access and Literacy Survey, a bi-annual survey conducted by the National Statistical Office, in collaboration with the Bank of Thailand, which reflect the current stage of financial inclusion and financial literacy in Thailand, as well as potential areas for improvement. A conceptual framework of the connections between FinTech, financial behavior, and financial knowledge and attitude, is then presented, to reflect the various feedback loops that policies could be used to address. The paper then reviews a three-pronged strategy aimed to promote FinTech, financial inclusion, and financial literacy in Thailand: (1) development of interoperable infrastructures that are key foundations of a digital economy; (2) introduction of supportive laws and regulations that help foster FinTech innovations and; (3) promotion of financial literacy at various fronts for people at various stage of life. The preliminary results of the three-pronged strategy for the provision of financial services, financial behavior, and financial literacy are then discussed. The paper concludes by presenting insights and key learning drawn from the Thai experience, which could also be useful for policy makers in other jurisdictions.

**Keywords:** fintech, financial literacy, digital payments, Thailand

**JEL Classification:** G32, G53

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## **PART I: INTRODUCTION**

FinTech has the potential to help improve financial inclusion and financial literacy, quantity-wise, and quality wise. With FinTech, more consumers could be encouraged to use cheaper, more readily available, and more easily accessed financial services, that are better tailored to meet their specific needs.

In Thailand, the results from the Thai Households Financial Literacy and Access Survey conducted by the Thai National Statistical Office (NSO), in collaboration with the Bank of Thailand (BOT), suggest that there is room for improvements in the areas of financial inclusion, and financial literacy. The Thai regulators have thus adopted a strategy to help promote the ability of the financial sector to serve the consumers better through: (1) the development of interoperable digital financial infrastructures, starting with digital payment to serve as a foundation for FinTech innovations, which could be further leveraged into other financial services such as digital banking products such savings and borrowing that better meet customer needs; (2) the adoption of supportive laws and regulations that will allow for more FinTech innovations and adoption; and, importantly; (3) recognizing the importance of financial literacy, where the Thai regulators as well as the private sector have embarked on various initiatives to promote financial literacy, with the aim of not only improving people's financial knowledge, but also to nudge them into seeking better products to meet their specific needs.

This paper reviews the three-pronged strategy, and the results so far, focusing on the impact on consumers' financial behavior. Given that FinTech is still very new, and that the financial landscape is changing fast, the results are not yet definitive, but the insights gained from such a review could help provide key information about the refinement of the existing policies, and the development of new policies, both in Thailand and abroad.

Part II of the paper starts by identifying stylized facts about financial behavior and financial literacy, as obtained from the Thai Households Financial Literacy and Access Survey. To promote financial inclusion in general, and FinTech in particular, it is helpful that the regulators are able to identify pain points among the consumers. Thailand's NSO, in collaboration with the BOT, have conducted the Thai Households Financial Access Survey and Financial Literacy Survey since 2013. The stylized facts provide a glimpse into financial behavior and financial literacy in Thailand, and suggest the pain points that might need to be addressed.

Part III of the paper starts by presenting a conceptual framework linking FinTech, financial behavior, and financial knowledge, which then serves a background for a review of the strategy adopted by the regulators to promote FinTech and financial literacy. Part III then reviews the strategy and the various initiatives that Thai regulators adopted to promote FinTech, including digital financial infrastructures such as PromptPay, the QR code standard, and National Digital ID, as well as the adoption of more supportive laws and regulations regarding FinTech. The results of the strategy and the effects of the initiatives on financial behavior are also presented. Additionally, the paper sheds lights on a number of projects pursued by the Bank of Thailand to promote appropriate financial knowledge, behavior, and attitude, and to address some of the challenges in the future.

In Part IV, the paper ends by discussing various key takeaways and lessons learned from the Bank of Thailand's perspective, which can be considered as recommendations to help policy makers further explore how to leverage FinTech to further expand financial literacy and financial inclusion and to meet consumer needs in the digital era.

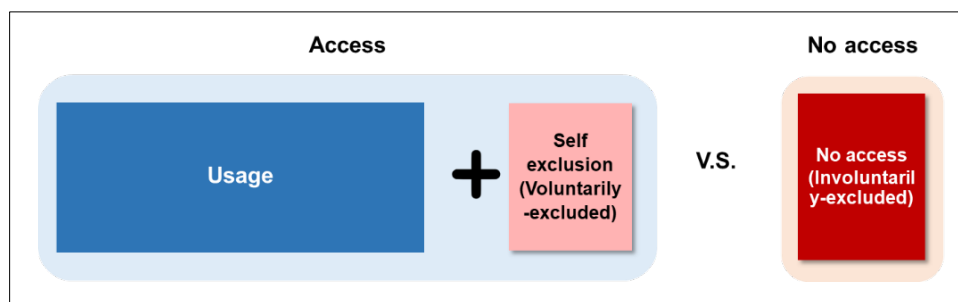
## PART II: STYLIZED FACTS ABOUT FINANCIAL BEHAVIOR AND FINANCIAL LITERACY IN THAILAND

This part presents stylized facts relating to financial behavior and financial literacy in Thailand. These stylized facts are based primarily on the results from the Thai Households Financial Access Survey, and the Thai Financial Literacy Survey conducted in 2016 and 2018. These surveys are conducted together bi-annually by Thailand's NSO in collaboration with the BOT. A total of 11,121 households were randomly selected for the survey in 2018 and 10,866 households for the survey in 2016, and surveyed from five regions (including Bangkok) across the country<sup>1</sup> in both urban and rural areas. The respondents were either the head of the household or a representative who was 15 years old or above.

### 2.1 Overall Financial Behavior: High Financial Access but also High Self-Exclusion

The Thai Households Financial Access Survey follows the World Bank's method (Demirgüç-Kunt, Beck, and Honohan 2008) for defining the level of financial access, which includes not only the use of financial services but also self-exclusion (Figure 1).

Figure 1: Definition of Financial Access



Source: Demirgüç-Kunt, Beck, and Honohan (2008).

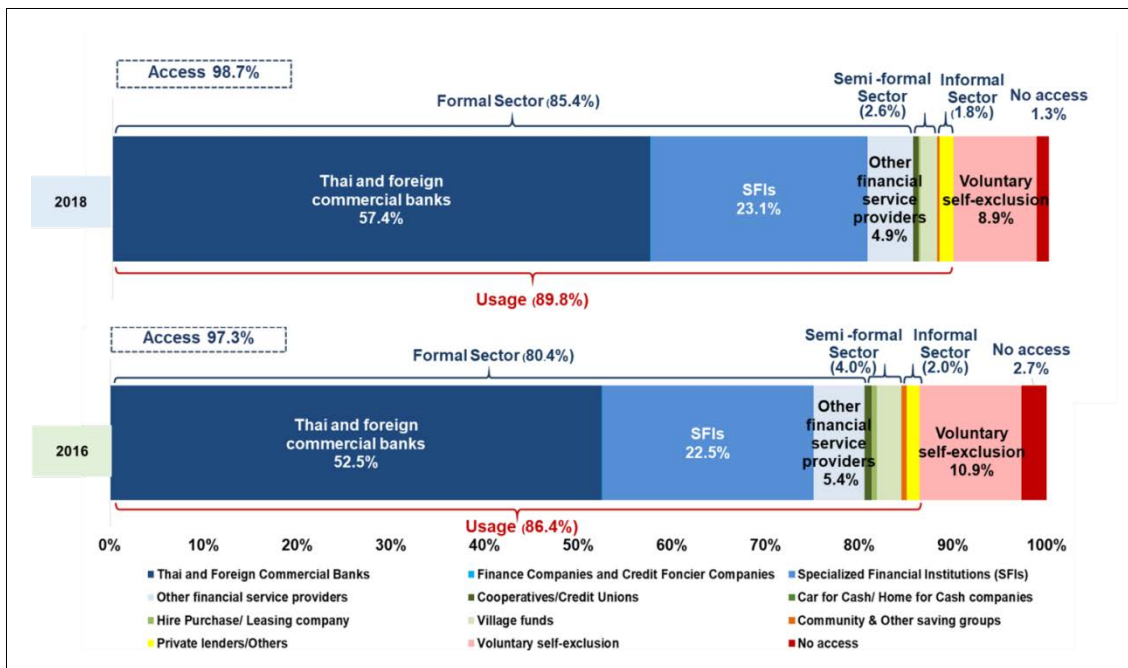
The survey (Bank of Thailand 2016a) measures access to eleven key financial services<sup>1</sup> commonly provided by financial institutions. According to this description, 2018 financial access level in Thailand was as high as 98.7%, compared to 97.3% in 2016 (Figure 2).<sup>2</sup>

Despite the seemingly high financial access, the 98.7% also contains approximately 9% of the voluntary self-excluded households, which are those who decided not to use any

<sup>1</sup> Eleven financial services include (1) deposits/ savings, (2) loans (excluding credit cards), (3) money transfers, (4) payments, (5) credit cards, (6) life insurance, (7) non-life insurance, (8) mutual funds, (9) government and central bank debt securities, (10) private securities, and (11) rotating savings groups  
<sup>2</sup> The Bank of Thailand released the Thai version of the Report on Financial Access of Thai Households for the 2018 Survey in December 2019; the English version is forthcoming.

financial service. The remainder were those who had demand for financial services but could not access any financial service (no access), which decreased from 2.7% in 2016 to 1.3% in 2018.

**Figure 2: Overview of Financial Access (for Eleven Financial Services)**



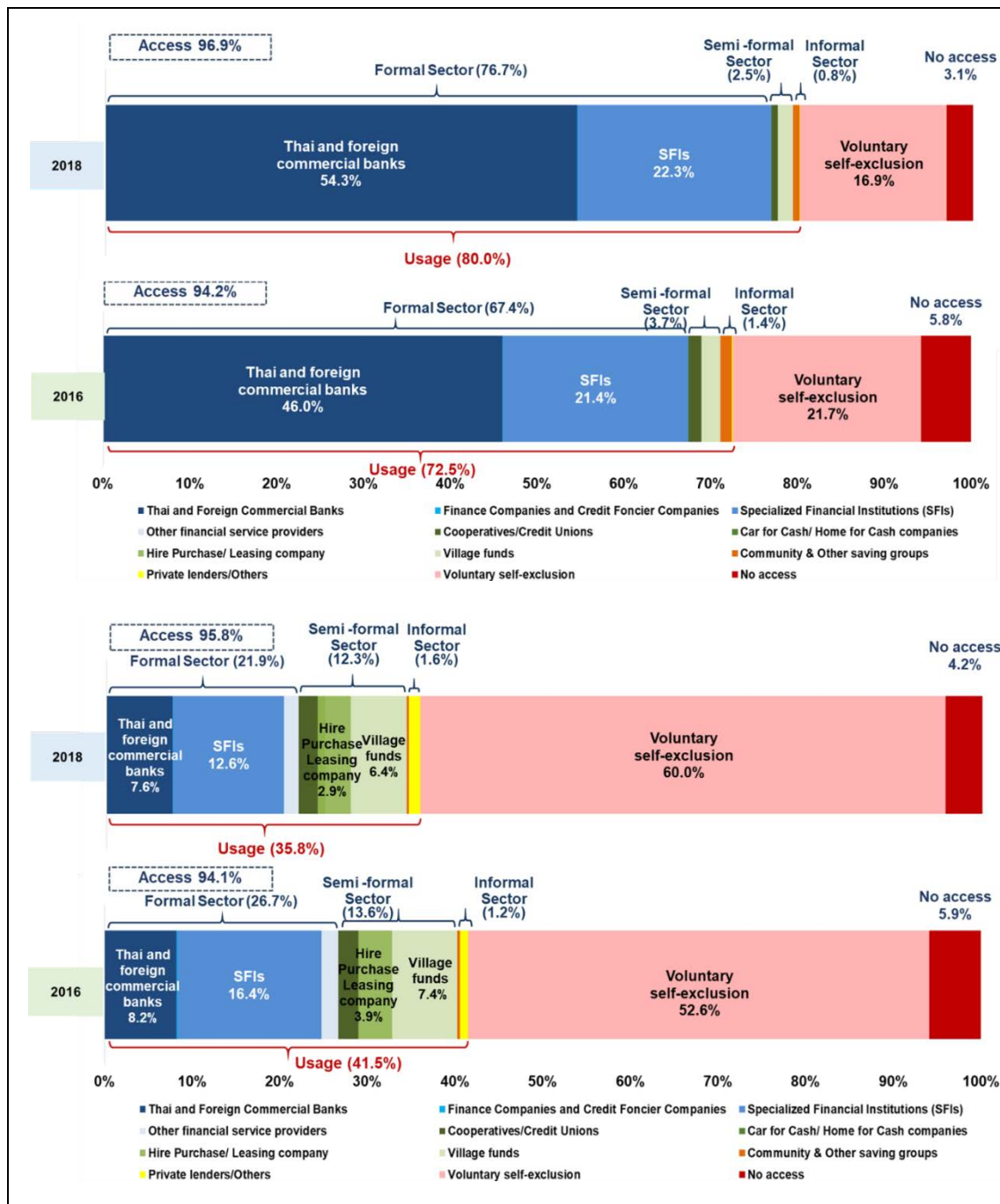
Source: Bank of Thailand (2016a); Bank of Thailand (2018); and authors' compilation from survey data.

Breaking this down into different types of financial services, for savings, the access rate was 96.9%, with the usage rate 80%, implying that the percentage of households that had access to deposit accounts but decided not to use them (voluntary self-exclusion) was 16.9%. For loans, 95.8% of households had access, but the usage rate remained as low as 35.8%, implying a 60% self-exclusion rate. Self-exclusion was at 53.3%, for payments and 31.4% for transfers.

Even though more than 90% of the households have access to basic financial services, it is interesting to explore why many Thai households decided not to use financial services despite having access.



**Figure 3: Access to Deposits/Savings Services and Loan Services**



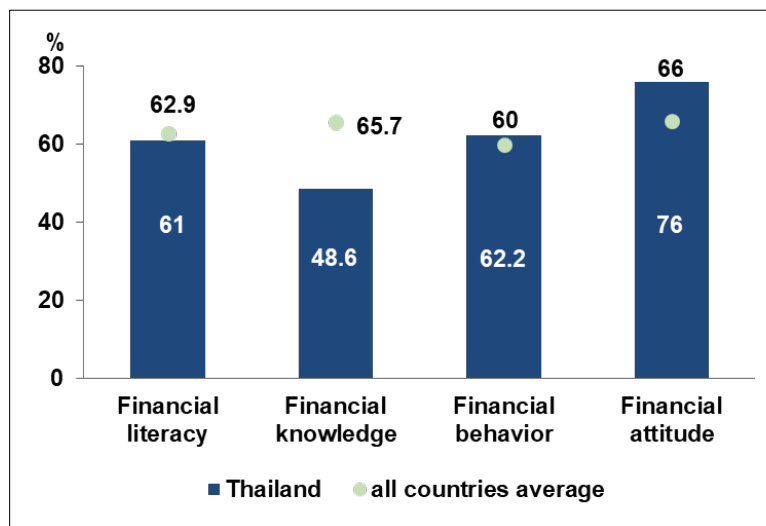
Source: Bank of Thailand (2016a); Bank of Thailand (2018); and authors' compilation from survey data.

## 2.2 Financial Knowledge Remains a Key Challenge

The Financial Literacy Survey in Thailand has adopted sets of questions and a method to measure adult financial literacy competencies from the Organisation for Economic Co-operation and Development (OECD) since 2013 (Bank of Thailand 2013). According to the OECD's survey methodology, financial literacy competency can be divided into three parts: *financial knowledge*, *financial behavior*, and *financial attitude* (OECD 2016).

Figure 4 is an overview of financial literacy in Thailand, where the average score for financial literacy was 61% (Bank of Thailand 2016b), which was slightly below 62.9%, the average score across all participating countries in the OECD survey.

**Figure 4: Average Score of Financial Literacy in Thailand Compared to the Participating Countries in the OECD Survey**



Source: Bank of Thailand (2016b).

When considering each component separately, Thai households performed well in terms of financial attitude, where the average score is remarkably higher than the average score for all participating countries. Thai households were in line with the average score of the participating countries as regards financial behavior. Conversely, financial knowledge remains a major weakness since Thai households scored averagely at 48.6%, which is lower than the average score from the participating countries, at 65.7%.

### Financial Knowledge

The financial knowledge section comprises seven questions on basic knowledge related to financial concepts and the ability to apply numeracy skills in a financial context. It is an important component of financial literacy as it helps consumers compare financial products and services, and make appropriate, well-informed financial decisions (OECD 2016).

According to the survey in 2016, Thai households performed well below the average score of all participating countries, especially regarding the concepts of compound interest rate, definitions and impacts of inflation, and benefits of diversification. The results also indicate that Thai households with lower education attainment and lower income are unlikely to answer these questions correctly (Bank of Thailand 2016b).

## **Financial Behavior**

This part of the survey assesses household actions and behaviors through questions related to choices regarding financial products, budgeting, financial planning, and behaviors on saving and spending. These behaviors are the foundations that shape a household's financial situation and wellbeing, in both the short and longer term (OECD 2016).

The average score of Thai households was 62.2%, marginally higher than the average score of all participating countries in the OECD survey at 60%. However, money management, choosing financial products in a literate way, and sufficient income are three areas that should be strengthened, since less than 50% of the households met these areas to an adequate extent. As with financial knowledge, the regression results from the financial literacy report also showed that higher education and income are positively correlated with good financial behavior (Bank of Thailand 2016b).

## **Financial Attitude**

The OECD report on adult financial literacy competencies recognizes that the knowledge and ability to act in a particular way are also influenced by an individual's attitude. Three questions in the financial attitude section are thus designed to gauge the respondent attitudes that are necessary for making sound financial decisions about money and financial planning for the future (OECD 2016). On average, Thai households scored 76%, higher than the average score of all participating countries at 66%. Only small proportions of the respondents agreed that they live only for today and that money is there to be spent, however, attitudes toward saving for the long term are the weakness in this category. This is reflected in 17% of the households who agreed that it is more satisfying to spend money than to save it for the future (Bank of Thailand 2016b).

### **2.3 There Seems to Be a Relationship between Self-exclusion and Financial Knowledge**

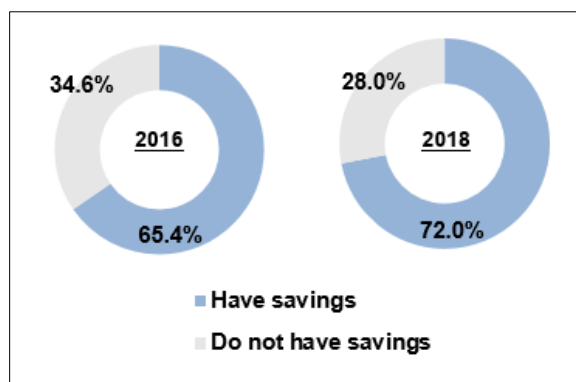
Major reasons cited by the voluntarily self-excluded households for not using financial services include lack of demand, poor financial position/insufficient income, lack of understanding the services provided, and lack of confidence about contacting banks due to fear of rejection. The last two reasons suggest that more work should be done related to financial literacy in order to boost the confidence and financial knowledge of the Thai consumers. These findings are consistent with Rojattanachai (2019), which, based on data from the 2016 Thai Households Financial Access Survey, runs various econometric estimations and finds the relationship between financial knowledge and the uptake of financial services among Thai households to be positive and statistically significant.

Since measuring financial literacy usually involves basic knowledge of financial concepts, such as interest rates, financial products, risk diversification, and financial planning (OECD 2016), it is generally accepted as a basis for people to make informed financial choices, including saving, loans, financial planning, and pensions (Klapper, Lusardi, and Oudheusden 2014; Lusardi and Mitchell 2014). An analysis of underlying problems and weaknesses is a first step toward further actions to formulate relevant policies to enhance appropriate use of financial services, before further discussions in the latter sections on policy formulation to improve financial literacy in Thailand.

## 2.4 Savings Remains a Challenge: Inadequate Income, Limited Range of Savings Products, Limited Planning and Discipline

Since saving is a foundation that helps smooth household income and expenditure flows, people who build savings are also likely to be more resilient to financial shocks and better able to meet financial goals. The proportion of households with savings rose from 65.4% in 2016 to 72.0% in 2018, as illustrated in Figure 5. However, still almost one-third of Thai households did not earn enough money to have savings.

**Figure 5: Proportion of Households with Savings**



Source: Bank of Thailand (2016a); Bank of Thailand (2018); and authors' compilation from survey data.

Figure 6 below shows that 38.3% of the households have savings primarily for emergency cases such as accident and sickness, followed by 34.7% who stated that their savings are mainly for retirement.

### Limited Range in the Use of Savings Products

Thai households still rely heavily on holding cash and making simple deposits to save for retirement. Around 41% of households rely on deposit accounts at commercial banks and Specialized Financial Institutions (SFIs), as their main savings products, while another 40% rely on cash as their main savings (Figure 6). This finding suggests inadequate retirement savings, since deposit rates at commercial banks and SFIs have very low interest rates, and cash yields no interest rates.

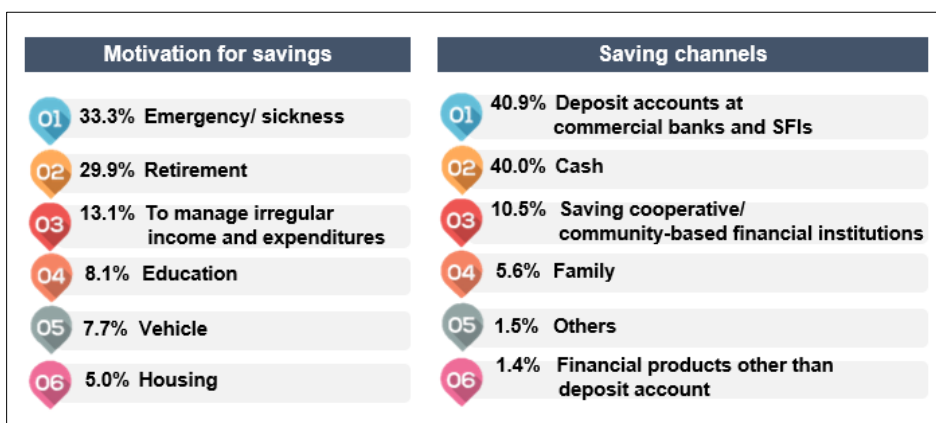
### Limited Budgeting, Planning, and Discipline

In terms of money management, while budgeting is considered an important tool that can help households plan and manage their day-to-day income and expenses, only 22.7% of the households surveyed in 2016 reported having a household budget.

While the percentage of households that have financial planning for retirement rose to 67% in 2018, only 19% of the households reported both having financial planning for retirement and being able to save according to their plans (Figure 7).

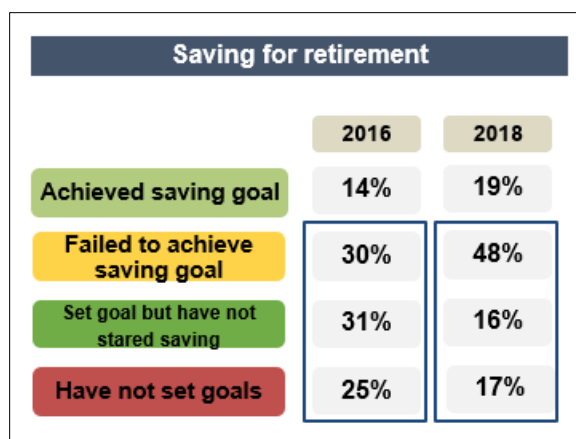
Another area of concern in financial behavior is choosing financial products in literate ways. Even among those that achieved their saving goals, only around three% saved via financial products other than a deposit account (Figure 8).

**Figure 6: Savings Motivation and Savings Channels**



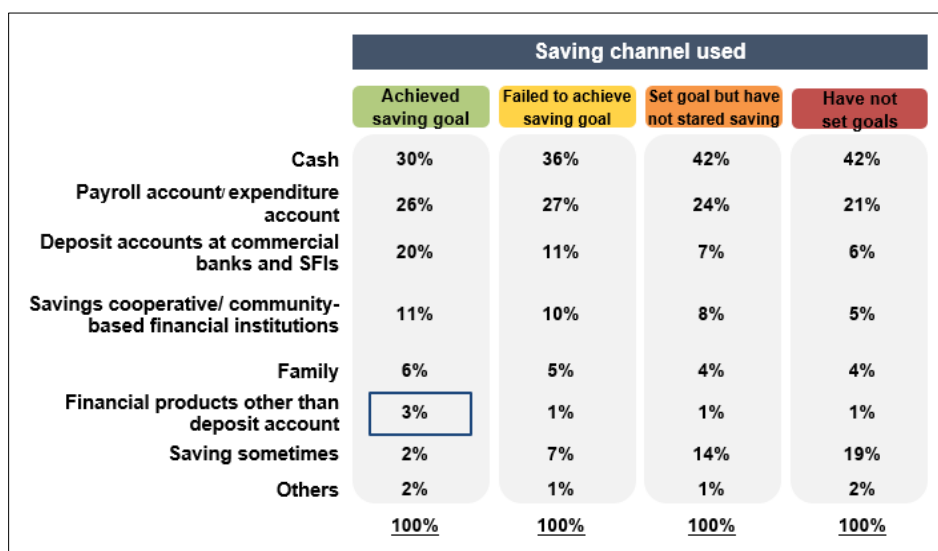
Source: Bank of Thailand (2018) and authors' compilation from survey data.

**Figure 7: Saving for Retirement**



Source: Bank of Thailand (2016a); Bank of Thailand (2018); and authors' compilation from survey data.

**Figure 8: Channels for Retirement Savings**



Source: Bank of Thailand (2018) and authors' compilation from survey data.

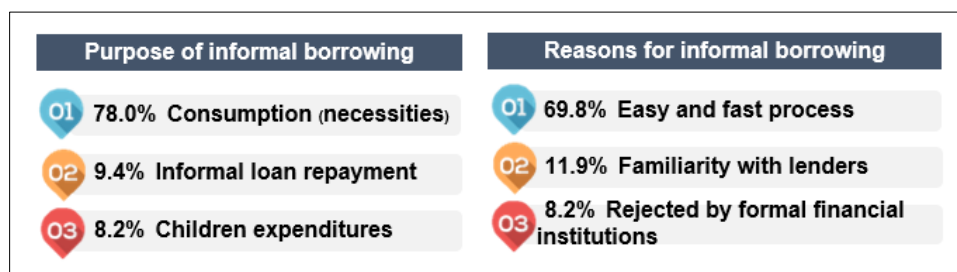
## 2.5 Borrowing: Low Level of Financial Literacy Is a Key Challenge

Informal lending remains a prevalent problem in Thailand, although only a small amount of the surveyed households admitted that they accessed the credit via informal moneylenders. Given that consumer protection does not apply to services provided by informal moneylenders such as loan sharks, consumers are sometimes exploited through excessively high interest rates, fraud, and extortion. According to a study by Achavanuntakul et al. (2015), informal lenders are predominantly known to charge from 3% per month to 3% per day (36% to 1,000% per annum).

### Lack of Financial Literacy Is a Key Reason for the Informal Loan Problem

Of those who borrowed from the informal lenders, 78% reported the purpose of borrowing as for necessities, 9.4% reported the purpose as to refinance informal loans, and 8.2% reported the propose as for child expenses. Almost 70% of the households that borrowed from informal sources reported “convenience” as the main reason for using informal loans, and almost 10% reported that they could not access credit from the formal lending sector.

**Figure 9: Informal Borrowing: Purpose and Factors Influencing Decision**



Source: Bank of Thailand (2018) and authors’ compilation from survey data.

**Figure 10: Reasons Cited for Not Accessing Formal Loan Services**

Reasons cited for not accessing formal loan services					
Commercial banks	Yes	No	SFIs	Yes	No
Poor financial position /insufficient income	46%	41%	Poor financial position /insufficient income	27%	41%
Lack of confidence /Fear of rejection	19%	19%	Lack of confidence /Fear of rejection	21%	20%
Lack of awareness/info	10%	15%	Complicated conditions /processes	18%	7%
Complicated conditions /processes	10%	6%	Lack of awareness/info	9%	10%
Long travel distance	8%	6%	Long travel distance	9%	3%

Source: Bank of Thailand (2018) and authors’ compilation from survey data.

Poor financial position was one of the main reasons that respondents did not access formal loan services, whether from commercial banks, or from specialized financial institutions (SFIs), and poor financial position/insufficient income was more common in the case of commercial banks (Figure 10). This is expected, since SFIs are expected to help those with lower income, however, sizeable proportions of respondents also cited lack of confidence/fears of rejection, complicated conditions/processes, lack of awareness/information, and long distance travel, as the reasons they did not access formal loans from SFIs or commercial banks.

## **2.6 Conclusion on Stylized Facts, and Possible Policy Responses**

The stylized facts above suggest that the use of financial services does not necessarily go hand-in-hand with financial access. Although financial access is already high for various types of financial services, including savings, lending, payments, and transfers, the use of some of these services is quite low. Furthermore, in the case of, there also seems to be problems regarding both savings and borrowing from both the demand and supply sides.

On the demand side, consumers seem to be relying on the wrong products, (e.g., excessive reliance on deposits and cash as their main savings products for retirement, and reliance on informal loans for convenience, despite low levels of consumer protection and disadvantageous terms), and to have low financial discipline (e.g., having inadequate budgeting, planning, and wherewithal to follow up with the planning, which resulted in inadequate savings, and the inability to exit informal loans).

On the supply side, there seems to be a limited range of products to meet customer needs. Deposit accounts are key savings products which offer low rates across the board. The use of investment products remains low, even for retirement savings. Furthermore, physical channels of distribution seem to affect the use of financial services. Complicated conditions and processes, along with long travel distances, are cited as reasons for not accessing formal loans, even at SFIs, for example.

Taken together, the stylized facts above indicated that, in order to improve both the quantity and quality of financial inclusion, regulators need to introduce policies that enhance financial knowledge in order to improve financial behavior and attitude on the demand side, and help reduce costs, improve efficiency, and encourage innovations in financial services on the supply side.

Financial knowledge, especially about the concepts of compound interest rate, inflation, and benefits of diversification, remains a major weakness in Thai households. Since financial knowledge helps individuals to compare financial products and services, and make appropriate, well-informed financial decisions, insufficient knowledge can lead to inappropriate financial behaviors and attitudes in at least two ways.

First, insufficient financial knowledge might prevent a person from using financial services due to their lack of understanding about financial products and a lack of confidence to contact financial institutions, as cited by voluntarily self-excluded households. Second, for those who use financial services, more desirable financial behaviors can be achieved, should there be sufficient knowledge about financial products and the benefits of risks and returns. As a large number of the Thai households do not understand the concept of time value of money and inflation, they miss investment opportunities by holding cash and making deposits at commercial banks and SFIs. A basic knowledge of interest rates charged on loans might help consumers to refrain from

using loan sharks and put more efforts into comparing financial products and making well-informed financial decisions.

To tackle problems on the supply side, the heavy reliance on traditional banking rather than adopting digital channels, which are actually cost-effective and more efficient, deprives consumers of the benefits offered by financial technologies. Given that the mobile and internet adoption rates in Thailand are high (World Bank 2017), digital financial services have great potential to be scaled up in order to provide convenient services and eliminate the wide gap between physical branches and banking networks, if digital literacy is achieved and the consumers have more confidence to adopt it.

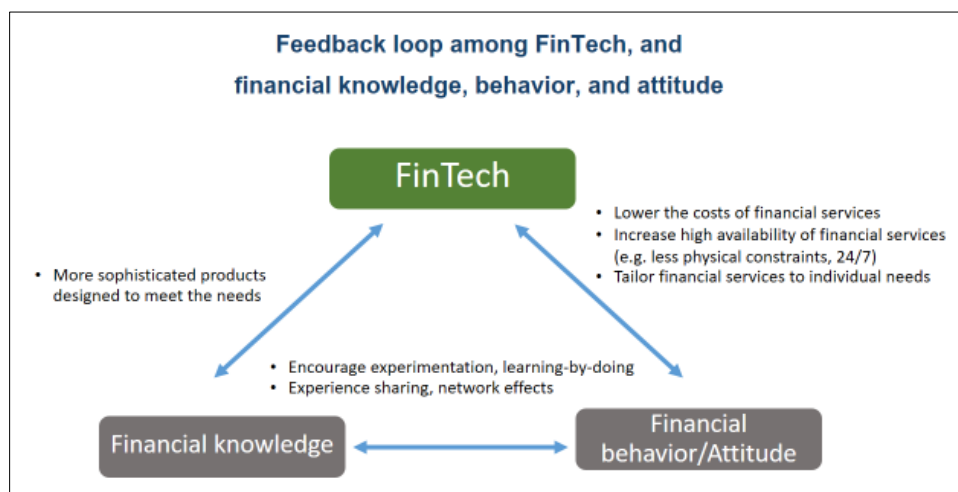
## PART III: FINTECH AND FINANCIAL LITERACY STRATEGY: THE THAI CONTEXT

Part 3 starts with a conceptual framework that highlights the feedback loop between FinTech, financial behavior and financial knowledge. The conceptual framework helps explain the rationale of the Thai regulators in their FinTech and financial literacy strategy. Part III then discusses the FinTech and financial literacy policies adopted by the regulators, before reviewing how these policies have influenced financial behavior in Thailand.

### 3.1 FinTech, Financial Behavior, and Financial Knowledge: A Feedback Loop

The literature in the emerging field of digital financial services suggests that there is a feedback loop between FinTech, financial behavior, and financial knowledge. FinTech, financial behavior, and financial knowledge have interdependent relationships, and can complement each other. A change in one area can affect the other two, with feedback loops that could further affect all the three areas. For example, FinTech innovations that lead to changes in behavior might affect user attitudes, induce users to seek more information, and thus be more financially literate, and demand more sophisticated products. This could then, in turn, encourage service providers to innovate new, more sophisticated FinTech products to meet the new demand (Figure 11).

**Figure 11: Feedback Loop among Technology, Financial Literacy, and Behavior**



Source: Authors' compilation.



According to the Global Findex (Demirgüç-Kunt et al. 2017), under a condition where the first entry point into the formal financial system is provided and easily accessible, digital payment can bring about significant increases in saving, and a shift from informal to formal saving. For developing countries, new products and FinTech can be leveraged because mobile phones and the internet are both widely accessible these days.

The positive impact of digital financial services not only applies to developing countries; some studies (Yeo and Fisher 2017) about the financial behaviors of the American households also suggested that FinTech firms have potentially positive effects on household finance and saving behavior. The regression results from Yeo and Fisher's (2017) study indicated that the frequent use of mobile financial services was significantly correlated with a greater likelihood of having a higher score for money management, making financial choices, and staying informed about financial issues.

A study by Morgan and Trinh (2019), examining the situation in the Lao People's Democratic Republic (Lao PDR), finds possible effects from financial literacy on the adoption of FinTech. In particular, financial literacy is positively correlated with the likelihood of awareness of Fintech products (Morgan and Trinh 2019). This is line with Yeo and Fisher (2017), who noted that FinTechs are unlikely to attract consumers who don't have previous financial knowledge. Results from both emerging and advanced countries pointed to the same conclusion, that financial literacy has positive implications for the awareness and the adoption of FinTech products.

## **3.2 FinTech Strategy: The Thai Context**

Given the conceptual framework above, it is not surprising that the endorsement of FinTech is a significant agenda that attracts attention from policymakers and academia, as it is academically and empirically believed that FinTech can encourage better financial access and financial behavior (Demirgüç-Kunt et al. 2017).

### **A. Start with Digital Payment**

In Thailand, digital payment is seen as a key building block for FinTech development and adoption. The adoption of digital payment can be further leveraged into the development and adoption of digital banking (savings and borrowing), and other financial products, including online investment and online insurance.

On its own, digital payment can help reduce costs associated with a consumer's short-term cash management, and improve efficiency, as digital payment can be made instantaneously and remotely. If cheap enough, digital payment could bring more people into the formal sector, make them more familiar with financial products, and reduce self-exclusion in the uptake of financial services, a pain point identified earlier in Part II. Importantly, digital footprints associated with the digital payment of customers could be used by financial services providers, including traditional players such as banks, or FinTech firms, and start-ups to learn about customer behavior and to tailor product offerings (including savings, and borrowing) that better serve customer needs.

Recognizing the potential of digital payment, Thailand's Financial Sector Master Plan III (2017–2020) endorsed the National e-Payment Plan as one of its core initiatives. By late 2017, a faster retail payment system (PromptPay) was built through close collaboration among the regulators, including the Ministry of Finance and the Bank of Thailand among others, and players from the private sector, including banks and the national payment switch operator (NITMX).

The arrival of PromptPay has since changed the Thai financial landscape and consumer behavior considerably, with digital payment and mobile banking taking off at an exponential rate (the details are discussed below). The development of PromptPay itself became a basis for the development of other common and interoperable digital financial infrastructures that create an ecosystem of digital payment, linking consumers not only in Thailand, but also regionally.

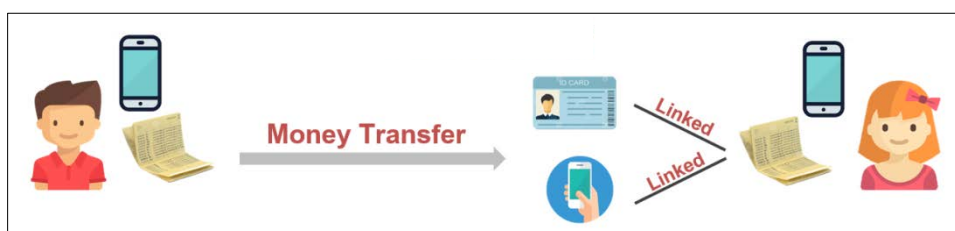
## B. Build Interoperable Infrastructures

Lessons learned from the collaborative development of PromptPay and its fast adoption by the public, and lessons learned from the fast evolving global FinTech scene, prompted the Thai regulators and players to emphasize building more interoperable financial infrastructures as a key foundation with which to support the digital economy, and to encourage the widespread adoption of FinTech innovations. The three key common digital infrastructures, either put in place or about to be introduced in Thailand, are PromptPay, the QR code standard, and National Digital ID.

### **PromptPay**

PromptPay, the country's fast retail payment platform, which links an individual's bank account with a mobile phone number or an individual's National ID card number, allowing users to make payments without the need to remember the recipient's account numbers, and allows the government's welfare payments to be credited directly into an individual's bank account.

**Figure 12: PromptPay**



Source: Authors' compilation.

PromptPay was introduced in late 2016, as a collaboration between the Ministry of Finance, the Bank of Thailand, and members of the Thai Bankers' Association. Apart from being simply a retail payment platform, PromptPay is also expected to allow users to become more familiar and confident about using digital financial services, which will expose them to more innovative products in the future. As an example, PromptPay has enabled users to make payments to online merchants in a very convenient way through mobile banking or e-wallet apps. With enough data about these online payments, services providers might be able to offer digital lending products to these small online merchants, in a more convenient way (e.g., through mobile phones), and with more attractive interest rates (as the operational costs associated with digital lending would likely be lower, and credit risks could be more accurately assessed from transactional data).

Since its introduction in late 2016, PromptPay products have been continuously extended to cover various use cases. For example, prior to 2019, PromptPay C-Scan-B (Consumer-Scan-Business) allowed consumers to use their mobile devices to scan a merchant's QR code at the point-of-sale in order to make a cashless payment. By early 2019, PromptPay B-Scan-C (Business-Scan-Consumer) was introduced to allow

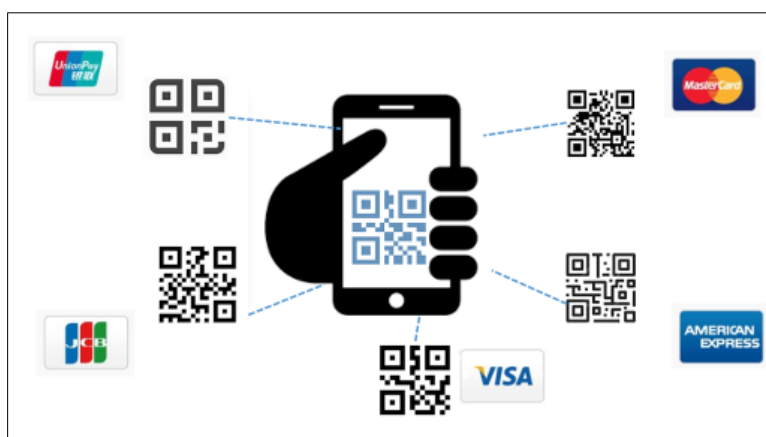
merchants to scan the QR code presented on a consumer's mobile device. In 2018, PromptPay had introduced a request-to-pay service, whereby merchants could send invoice through the PromptPay system, requesting customers to pay for their purchases. Upon receiving the request-to-pay, customers can use their mobile banking applications to pay as requested.

### **QR Code Standard**

In recent years, the QR code has grown as a way for users to make and receive electronic payments. QR codes can be scanned using a mobile banking or an e-wallet app, and funds transferred from the payer's account to the recipient's account. Given the rapid growth in the use of mobile banking and e-wallets, the QR code is an attractive channel for small merchants and micro SMEs to receive e-payments. Since they do not need to store and manage cash on hand, electronic payments help save time and reduce the risks associated with handling cash. QR codes are particularly attractive for small merchants, micro-SMEs, and even the self-employed, since it is cheaper and more flexible to install at a point of sale compared to EDC card readers.

Without a single QR code standard, however, it is likely that services providers will compete to create their own closed-loop payment ecosystems, whereby a mobile banking app from a payment scheme might not be used to scan the QR code from a rival scheme. Such a situation creates frictions that could render QR code payment inconvenient and unattractive, discouraging QR code adoption by customers and merchants alike. The data generated by a QR code in such a situation would also be segregated between various closed-loop systems, hampering the ability to fully leverage analysis on this data. To prevent such a situation, in 2018, the Bank of Thailand, in collaboration with five global credit card companies,<sup>3</sup> introduced the world's first QR code standard that allows interoperability between the five global schemes and supports seamless payments from various sources of funds (credit/debit card, bank account and e-wallet), from both domestic and international customers.

**Figure 13: QR Code Standard**



Source: Authors' compilation.

<sup>3</sup> AMEX, Visa, MasterCard, JCB, and China Union Pay.

By April 2019, QR codes were installed at more than 4 million points-of-sale, which include a diverse set of users, ranging from small merchants in wet markets to the drivers of motorcycle taxis. Various players are also developing other innovative uses for QR codes, such as providing alternative sources of information for credit scoring and disbursing loans, and extending financial solutions to underserved people.

The QR code standard complements the PromptPay system in promoting a greater adoption of digital payment by providing a choice for micro SMEs to receive electronic payments and offering customers greater convenience in making such payments. Moreover, it ensures that the retail electronic payment network is not fragmented, the payments are seamless, and network value is preserved.

The QR code standard could be used to promote ASEAN connectivity. The Bank of Thailand has been collaborating with ASEAN central banks to facilitate the interoperability of financial infrastructures and standards. The Bank of Thailand has already signed the memorandum of understanding (MOU) on Cooperation in the Areas of Payments and Financial Innovation with the National Bank of Cambodia, the Bank of Lao PDR, and Bank Indonesia. The MOUs aim to enhance collaboration on financial innovations and payment services to promote more efficient and secure domestic and cross-border payment transactions, and to promote the use of local currencies.

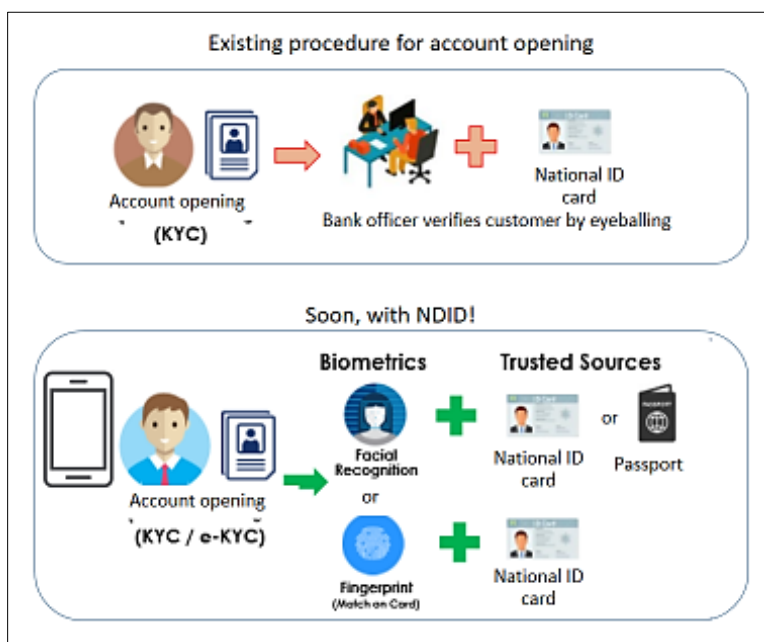
In the case of the Lao PDR, the Bank of Thailand and the Bank of Lao PDR have worked together to develop an interoperable QR Code for payments and innovative real time remittance to facilitate cross-border retail payment services between the Lao PDR and Thailand. Retail cross-border payment services are important for financial inclusion, since there are many migrant workers in the region needing to remit their income home in a safe, cheap, and convenient manner, and there is also a growing trade in border provinces. In 2019, the Thanachart Bank Public Company Limited (TBANK) and Banque Pour Le Commerce Exterieur Lao Public (BCEL) jointly introduced a cross-border QR payment service between Thailand and the Lao PDR. The service allows BCEL clients to make payments in Thailand in real-time by simply scanning the Thai standard QR code of Thai merchants with their BCEL mobile banking application.

### ***National Digital ID***

National Digital ID (NDID) is another common infrastructure project that aims to help promote the use of FinTech in the digital economy by allowing members to securely exchange data to verify and authenticate customers. The use of this common infrastructure helps customers to make financial transactions (including account opening, and loan applications) as more seamless experiences, as they do not have to repeatedly lodge the same documents to different financial institutions. The development of NDID could be extended to benefit other financial services, including digital lending and bio-payments.

NDID could act as a platform that allows the verification of user identity electronically, from parties within the platform. In financial services, this would allow for e-KYC, whereby a customer can open an account with a new financial services provider on a mobile app, by giving consent for the new financial services provider to verify the customer's credentials with an authoritative source on the NDID platform.

**Figure 14: e-KYC with National Digital ID**



Source: Authors' compilation.

The NDID project is a collaboration between public agencies (including the Bank of Thailand), and the private sector. Commercial banks would be the first players to utilize the platform, and the first projects (on e-KYC) are expected to leave the BOT's Regulatory Sandbox and go live by early 2020. The introduction of NDID is expected to help further promote FinTech, as e-KYC would be a foundation for many financial services applications. In the future, the platform itself, which will ultimately also connect players outside the banking sector, could also act as infrastructure that helps improve the flows of data within the economy.

**C. Augment the FinTech Ecosystem with Supportive Laws and Regulations**

In addition to the introduction of interoperable, common digital financial infrastructures, the regulators also introduced new laws and regulations to support FinTech innovations and adoption. Regulatory sandboxes to encourage FinTech innovations have also been adopted by the regulators.

***Supportive Laws and Regulations***

In 2018, the new Payment Act was introduced, allowing more flexibility to support or regulate the emergence of new payment systems and services in the future. In order to increase consumer confidence in using digital payment services, this act emphasizes that payment services providers must ensure the efficiency, safety, and security of their system. In that same year, regulations were introduced to bring peer-to-peer lending under the BOT's supervision, and crowdfunding under SEC's supervision. Peer-to-peer lending and crowdfunding are expected to help smaller SMEs to access funds in a cheaper way, and to provide investment alternatives for individuals and qualified investors. In 2018, the Emergency Decree on Digital Assets was introduced to provide a framework for regulating new ways of fund raising (e.g., initial coin offerings), and emerging types of digital assets.

### **Regulatory Sandboxes**

The Bank of Thailand, Securities and Exchange Commission, and Office of Insurance Commission each introduced its own regulatory sandbox to allow FinTech firms to test their FinTech products in a safe environment. Since its introduction in 2016, various FinTech innovations have been tested in the BOT's regulatory sandbox. These products include Letter of Guarantee by Blockchain Technology, Seller Financing on e-Marketplace using Machine Learning Credit Scoring and E-KYC by E-Passport. The Standardized QR Code for Payment is the first FinTech innovation that passed the BOT's regulatory sandbox.

In 2018, the BOT embarked on a Regulatory Guillotine and decided to make its sandbox regulations even more flexible, to help improve time-to-market for FinTech innovations. From 2018 onwards, only FinTech innovations that are themselves part of a common infrastructure (e.g., e-KYC through NDID), or those that are required by law to be tested in the BOT's sandbox (i.e., those related to crypto assets, or those related to peer-to-peer lending) need to be tested in the BOT's Regulatory Sandbox. Other FinTech innovations could instead be tested in the financial institution's own Sandbox, provided that they submit their testing schedule to the BOT.

## **3.3 Results of the FinTech Strategy**

The strategy to promote FinTech via the development of interoperable structures and the introduction of supportive laws and regulations has resulted in increased competition within the financial industry, and the introduction of various digital products that have the potential to better meet a consumer's specific needs and improve financial inclusion.

### **3.3a. Effects of Interoperable Infrastructures on the Financial Industry**

The introduction of PromptPay has fostered competition in payment industry and encouraged Thai commercial banks to eliminate electronic funds transfer fees, with the aim of attracting new customers and to retaining existing the customer base. Prior to March 2017, electronic fund transfers were subject to a minimum fee of 25 baht per transaction for most banks. By late March 2017, as banks realized that they should attract customers to make transaction in their system to gain a larger customer base, and collect transactional data that could be used to build more customized products for their customers, they competitively cut their fees to zero within weeks.

The elimination of the retail fund transfer fee, which was induced by the introduction of PromptPay, along with other incentives, including the government's personal tax income refund via the PromptPay system, also helped to increase PromptPay's popularity. PromptPay also allows users to become more familiar and confident in using digital financial services which will help expose them to more innovative products in the future. Since its launch, the number of IDs linked to bank accounts via PromptPay has risen from 28.3 million IDs in May 2017 to 50 million IDs in May 2019. Moreover, the number of electronic payment transactions also rose from around 440 million transactions per month at the end of 2017 to almost 700 million transactions in May 2019.

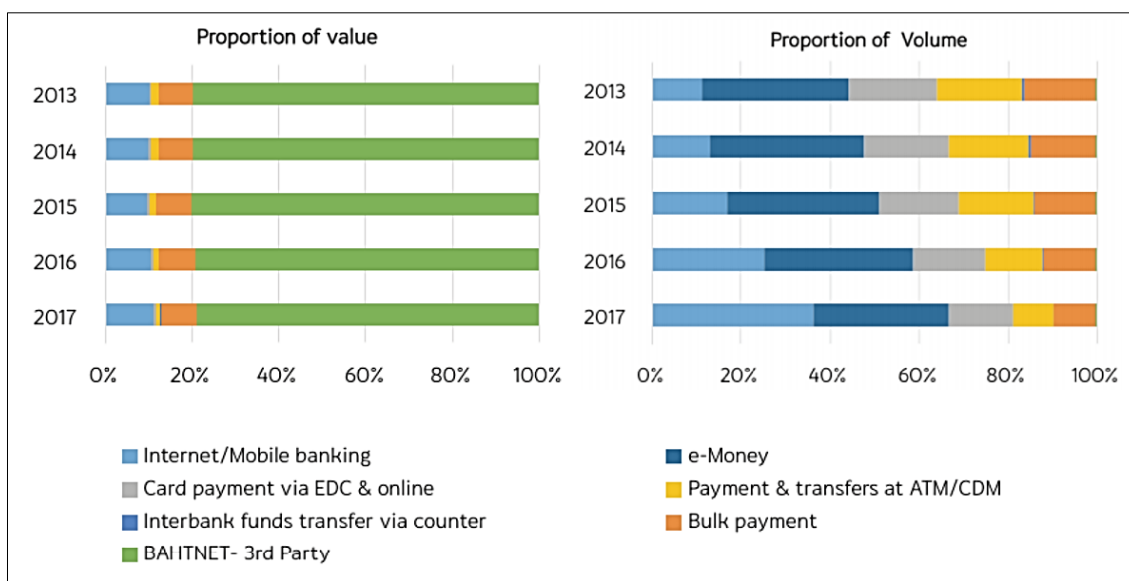
### 3.3b Effects of FinTech on Financial Products

The introduction of interoperable infrastructures such as PromptPay and the QR code standard has spawned not only competition and efficiency gains in the financial industry, but has also led to changes in consumer behavior, which themselves further spurred new financial products and services.

#### Payments

The introduction of PromptPay has resulted in the fast adoption and utilization of digital payment. Even *prior* to the introduction of PromptPay in late 2016, e-payment had already grown remarkably fast. The volume of e-payments per person had already doubled from 31 transactions/person/year in 2013 to 63 transactions/person/year in 2017. This growth was mostly contributed by internet/mobile banking and e-money transactions, while transactions via ATM/CDM and counter services trended downwards. The share of internet/mobile fund transfers rose from 11% to 36% during the same period (Lamsam et al. 2018).

**Figure 15: Proportions of Electronic Payment Methods**



Source: Lamsam et al. (2018).

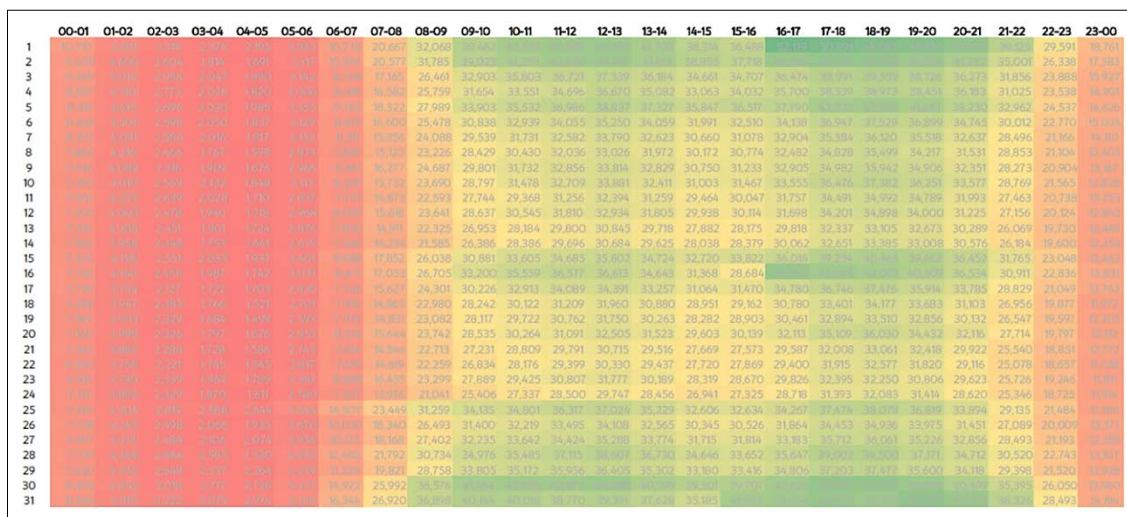
After the introduction of PromptPay, the rise in e-payment was even more dramatic, particularly that done through mobile banking. The total volume of transactions made through mobile banking rose from 76.3 million transactions per quarter in 2017 Q2 to 1,080 million transactions per quarter in 2019 Q2. The value of transactions rose from around \$15 billion per quarter to \$193 billion per quarter over the same period.

The rise in transactions through mobile banking was notable, since it reflected the convenience gained by consumers, who could now make payment transactions 24/7 from their mobile phones, instead of waiting in line at branches (which have opening and closing hours) or ATMs, to make payment transactions.

The success of PromptPay in permeating everyday life is partly reflected in Figure 16 above, where the vertical axis shows the day of the month, starting from the first day of the month at the top, to last day of the month (30th or 31st day). The horizontal axis shows the hours of the day, starting from midnight, to the 24th hour. PromptPay's

payment volume was found to be at its highest levels (in green) at around 4:00–5:00 p.m., on the first day of the month, and the 16th day of the month, which coincides with the times the national lotto results are announced, along with the last day of the month (payday for many).

Figure 16: PromptPay Transactions by Date of Month and Hour



Source: Lamsam et al. (2018).

### Account Opening: e-KYC

In the future, with the implementation of the NDID system which allows customers to authenticate and verify themselves electronically on mobile devices, the growth of mobile banking is expected to grow even faster, and more products to proliferate. By the end of 2019, once the tests in BOT's Regulatory Sandbox are completed, the BOT is expected to allow banks to enable their existing customers to open new bank accounts using e-KYC through mobile channels. By early 2020, the BOT is expected to allow cross-bank e-KYC, whereby banks can accept new customers (who already have accounts at other banks) through mobile banking channels. Insurance and securities companies are also expected to test their e-KYC system in the Regulatory Sandbox in 2020.

### Digital Savings Products

On the saving side, several banks in Thailand have announced their plans to leverage e-KYC once the test in the Regulatory Sandbox is completed. TMB, a pioneer in self-service banking in Thailand with approximately 2.5 million users of its mobile banking app as of 2019, plans to scale up their digital saving account product, called Me by TMB, which is currently offering higher interest rates than typical saving accounts for amount of deposits up to 10 million baht. Once its e-KYC project is allowed to come out of the BOT's sandbox, TMB plans to request the Bank of Thailand's permission to accept deposits in excess of 100,000 baht through their mobile banking channel.

Apart from the mobile banking channel, K-Bank, another large local bank with around 10 million users of their mobile banking app as of 2019, has already been offering deposit account opening through e-KYC at their kiosks. The so-called e-Saving accounts offer interest rates of 1.5% a year, which is three times higher than the interest rates offered on their normal savings account. Once e-KYC is accepted, customer onboarding through mobile channels will be even more convenient



With e-KYC, both TMB and K-Bank have announced their intention to extend their mobile banking apps to electronically onboard customers to other products, including investment products such as mutual funds, and insurance.

### ***Digital Lending Products***

On the borrowing side, the competition for digital lending is growing fast, owing to the exponential increase of the number of mobile banking applications, and the growing use of transactions through digital platforms and social networks. These online financial activities allow banks to better understand customer behavior, leading to better credit risk analysis.

The Siam Commercial Bank (SCB), with around 10 million users of its mobile banking app as of 2019, has targeted the amount of digital lending at 80 billion baht (\$2.7 billion) for the year 2020. In 2019, SCB expected to grant 45 billion baht (\$1.5 billion) in loans through digital lending. In 2019, digital lending accounted for 25% of SCB's loan applicants, exceeding its target. However, the quality of their digital lending portfolio is expected to be slightly worse than the normal portfolio since digital loan borrowers are often younger, with less work experience. K-Bank, meanwhile, has set its digital lending target for 2020 at 100 billion baht, although it is expected to clear 20 billion baht (\$600 million) in digital lending for 2019.

Bangkok Bank, with around 8 million users of its mobile banking app as of 2019, has already provided digital lending to their payroll customers, and merchants have received payments above 50,000 baht for at least six consecutive months through QR codes, with loan sizes at around two to five times income. In 2020, Bangkok Bank expects to provide digital lending to 10% of their payroll customer base, which accounts for 2 million customers, from its total deposit account customers of 17 million.

## **3.4 Building Financial Literacy**

Financial literacy is acknowledged by both the private sector and the public sector as a key area that needs improvement. As discussed in Part II, Thailand received a rather low financial literacy score from the OECD survey. Since then, various projects and initiatives have been introduced.

### **3.4a Private Sector Initiatives**

On the private sector side, the Thai Bankers Association (TBA) has created a working group to help build financial literacy between university students. Starting in 2018, the working group created a network of volunteers of commercial bank staff who would work as trainers to help develop financial literacy among university students. Their approach is to leverage the TBA members' branch network, comprising more than 7,000 commercial bank branches, and more than 150,000 commercial bank staff throughout the country. The content would be standardized, and include areas such as daily budgeting, financial planning, saving, and borrowing. In 2018, the trainers helped train over 2,300 students in Greater Bangkok area through pilot projects, and since then, with a growing network of volunteers, the project has been extended to other parts of the country.

### 3.4b Public Sector Initiatives

To help improve the quantity of financial inclusion, the promotion of financial literacy is now a key mandate for the Bank of Thailand. The BOT continuously promotes better financial knowledge and behavior through a number of projects, of which the two most prominent are “Fin-d we can do!” and “Fin-d happy life”. Both projects aim to foster basic financial knowledge that will help people to understand the basic features of financial products and services, enable them to compare and use a product that is best fitted to their needs, manage their finances effectively, and be receptive to a fast-changing landscape.

The Fin-d we can do! Project was launched in 2017 with the objective of raising financial awareness and promoting good financial discipline in generation Y, and specifically vocational students and first jobbers. The project emphasizes the use of social platforms as a tool to engage peer-to-peer interaction and offer friendly activities to motivate desirable behaviors. At the end of the project, the results showed that the saving-to-income ratio of the participating vocational students was higher than that for those who did not join. This finding confirmed the success of this project in building positive attitudes to saving.

Not long after the launch of Fin-d we can do!, “Fin-d happy life!” was introduced in 2018. This project was inspired by a common financial problem among private and government employees; the lack of financial discipline and the absence of consistent saving, causing over-indebtedness. Fin-d happy life! was designed to emphasize cultivating prudent financial behaviors and to foster financial immunity and skills. The project had such a positive outcome that loan repayments per month of the participants decreased by 12% and their monthly saving increased by 3%.

In addition to the above projects, the Bank of Thailand educates the public on the use of digital financial products and services. To ensure that the information reaches all targeted groups, the Bank of Thailand has produced infographic materials to provide knowledge about digital financial risk control, enabling the public to use digital financial products and services in a safe and secured manner, and to improve knowledge of consumer rights and redress procedures.

## 3.5 Going Forward: Challenges Remain

Despite its advantages, FinTech also brings with it the challenges of digital divide, which can worsen economic inequality. Promoting the use of digital financial services could shift customer preferences and behaviors toward less contact with physical bank branches. In 2017–2018, there was a reduction of almost 300 branches (Figure 17). The closure of physical branches could be a problem for those in remote areas and those who have yet to onboard the digital trend. To help alleviate potential problems, in 2019, the Bank of Thailand introduced a new regulation allowing more flexibility for banks to appoint their own banking agents (such as convenience stores). To help the population safely onboard the digital trend, the Bank of Thailand is also promoting *digital* financial literacy. Various campaigns have been made to raise public awareness about cyber security, for example, and safe practices when using mobile banking.

**Figure 17: Changes in the Number of Bank Branches**

Bank size	Number of branch	Open/Close	
	2016	2017	2018
Large	5,308	-168	-92
Medium	1,199	-90	-28
Small	475	+26	+71
System	<u>7,016</u>	<u>-232</u>	<u>-49</u>

Source: Authors' calculation from Bank of Thailand Statistics. <https://www.bot.or.th/English/Statistics/FinancialInstitutions/Pages/StatNumberofBranches.aspx>.

From the regulators' point of view, promoting financial inclusion and financial literacy, along with FinTech, requires a delicate balance. For example, the promotion of digital lending could help tackle the problem of credit access between certain groups of population, especially those with low or irregular income and no traditional financial track record. Digital lending uses more behavioral data to assess credit risk, and relies on digital channels to reduce operating costs. More accurate risk assessment based on alternative data and lower operating costs could help financial services providers reach out to more underserved customers, and help promote financial inclusion.

The promotion of digital lending, however, might need to be balanced with the issues surrounding rising household debt level. Here, the promotion of financial literacy will be crucial to ensure that easier access to credit will be used responsibly. Regulators must thus be keen enough to tailor their policies to address specific problems, rather than adopting a one-size-fits-all approach. In the light of this, promoting good saving and spending behavior is also a top policy priority at the Bank of Thailand. Fostering the right financial attitude, knowledge, and behavior is key to ensuring the merits of FinTech and safeguarding the well-being of the citizens.

## **PART IV: CONCLUSION: EXPERIENCE AND LESSONS LEARNED**

The experience of Thailand suggests that FinTech, financial behavior, and financial literacy, do indeed go hand-in-hand. Indeed, various pieces of evidence in Part III, including the fast rise in digital payment, the rise in the number of users of mobile banking apps, and the proliferation of increasingly sophisticated FinTech products being offered through digital channels, suggest that there might be a feedback loop between FinTech, financial behavior (including savings and borrowing, along with payments), and financial literacy.

The stylized facts from Part II have shown that while overall financial access in Thailand is high, the use of financial services by Thai consumers could be improved, quantity-wise (e.g., reducing voluntary self-exclusion), and quality-wise (e.g., improving financial behavior, increasing product choice, and raising financial literacy). To address these issues, Thai regulators have adopted strategies that involve:

1. Development of interoperable infrastructure, starting with digital payments, which could serve as a foundation for FinTech development and adoption, and nudging users toward using cheaper and better financial services;
2. Adopting supportive laws and regulations to encourage FinTech innovations, creating a better and greater variety of products that can be offered to consumers at a cheaper cost;
3. Building financial literacy to encourage the more judicious use of financial services, such that consumers will be better off in the long-term.

As explored in Part III, early results suggested that the strategy seems to have worked well in promoting FinTech innovation and adoption, particularly in terms of digital payment. Going forward, with the upcoming adoption of NDID, competition in other financial services including savings (deposits and investments), and digital lending is expected to be fierce. Financial services providers are planning to offer more products tailored to consumers' specific needs, offered at cheaper costs through digital channels. The results of various financial literacy initiatives, however, will take some time to assess. Scaling up financial literacy to the general population will also be very important, but challenging. While the adoption of FinTech is expected to help raise consumer awareness of financial products, digital financial literacy will also be needed to help reduce the digital divide.

The key takeaways and lessons learned below reflect Thailand's experience, which might be useful.

#### **4.1 Policy Formulation Should Be Evidence-Based**

Formulating policies on FinTech and financial inclusion requires insights into consumer behavior. The Thai Households Financial Access and Financial Literacy survey have proved useful for helping regulators to understand the situation, and to use that understanding to formulate appropriate policy responses and strategies.

For example, the Thai Households Financial Access Survey conducted in 2016 indicated a low uptake of deposit accounts (i.e., high self-exclusion in deposit account use), owing to issues including high account maintenance fee. In response, in 2018, the Bank of Thailand, collaborated with the members of the Thai Bankers Association, and two of the SFIs (the Government Savings Bank, and the Bank for Agriculture and Agricultural Cooperatives) to introduce Basic Banking Accounts (BBAs) for low income (those with government welfare cards) and senior individuals (age above 65 years old). BBAs charge zero fees for account maintenance and for debit cards, given that certain conditions are met. By July 2019, more than 1.5 million BBAs had been opened.

The increased uptake of deposit accounts is expected to provide an avenue for low income and senior individuals to step up to other more sophisticated products, including insurance and investments. Given that banks and SFIs would be able to provide cheaper and more customized financial products through their mobile banking apps, largely by leveraging common infrastructures such as PromptPay, QR code, and NDID, it seems that BBA is a piece of the jigsaw that helps financial inclusion in the digital age.

## 4.2 Strategy and Coordination are Key to the Success of Policies

The fast adoption of digital payment in Thailand required much initial coordination between players from different sectors. PromptPay was part of the National e-Payment Plan, implemented partly through the Financial Sector Master Plan III. Although the National e-Payment Plan itself was formulated by the Ministry of Finance and the BOT, participation from the private sector was also a key element of the success. As such, the BOT helped coordinate members of the Thai Banking Association, and other relevant parties, including NITMX, the retail payment switch, in the design of the system, from business, technical, and legal standpoints.

With private sector participation, the design of the system is expected to be practical and to meet the actual needs of customers. When there are issues that cannot be settled between the private sector players, however, the regulators would need to intervene and help steer them toward solutions that best serve public interests. Such a model of collaboration has become increasingly important, since interoperable infrastructures are key factors in allowing data and payments to flow smoothly in the digital economy. The subsequent development of the QR code standard (which required collaboration from five global credit card companies, along with local banks), and NDID (which required collaboration from players outside the banking sector) followed this model of close collaboration between the public and private sectors.

On the financial inclusion side, the creation of BBA also required a close collaboration between banks, SFIs, and the BOT. At the national level, the government has assigned the formulation of the National Financial Literacy Plan as one of the national agendas in 2017. The Ministry of Finance is responsible for drafting the plan, in cooperation with other government agencies such as the Ministry of Education and the Bank of Thailand. The main objectives of the National Financial Literacy Plan are to (1) raise awareness of Thais regarding personal finance management by setting up a national campaign on this theme to holistically govern the financial literacy policies of government organizations toward the same direction, leading to a greater impact on a larger group of people; and (2) improve the financial discipline and literacy of the Thai people, which would allow them to plan and manage their financial positions more efficiently by providing a capacity building program in the form of training and activity, and making educational material and communication media for different target groups, including children and youth, first jobbers, salary workers, low-income earners, informal workers and aged people.

To help promote savings, apart from the National Financial Literacy Plan, the government has also launched National Savings Fund in 2015 to provide social insurance for self-employed people who are not currently under the government pension scheme or social security system. The fund would not only encourage savings discipline, but the government will also grow those savings through the investments managed by professional fund managers. This will provide guaranteed returns for members of the fund, so that they will receive a pension after retirement. Currently, the fund has around 2 million members and 6 billion net asset value.

### **4.3 Building Financial Literacy Is a Nurturing Process and Needs to Be Done alongside FinTech Policies**

A key challenge in building financial literacy is the fostering of the right financial knowledge, attitude, and behavior, which is a continuous process. In Thailand, as mentioned above, many Thais still lack the basic financial skills and knowledge which are foundations of personal long-term financial well-being. To be inclusive, policies need to be formulated and implemented at various fronts, including raising fundamental financial knowledge such as about savings for children, financial planning in daily life, and information on basic financial products. Policy intervention could range from the distribution of useful information tailored to people from different age groups, through exhibitions, lectures, publications, and on-site workshops at academic institutions, to the introduction of the Basic Banking Account (BBA) for the poor and elderly to give people an opportunity to engage with a formal financial product regardless of their income or age.

While cultivating basic knowledge is extremely important, it can be done in tandem with FinTech promotion, where basic knowledge could be further developed into more sophisticated skills and knowledge (e.g., the use of digital financial services). The development of digital infrastructures is also essential to encourage a learning-by-doing mechanism for both financial services providers and consumers. The introduction of PromptPay helped lower the cross-bank funds transfer fee to zero, and trigger an exponential growth in digital payment and mobile banking that might not otherwise be possible.

### **4.4 Understanding Customer Pain Points and Creating Trust Is Crucial**

Although FinTech and digital finance can greatly benefit customers in many ways, these benefits cannot be reaped unless customers have trust and are open to new developments. Additionally, without adequate and proper digital knowledge, consumers could be easily misled and taken advantage of. From the viewpoint of regulators and services provider, understanding user problems and needs is extremely important in order to create trust in the system.

In order to understand user needs, pertinent questions were incorporated into the Thai Households Financial Access Survey. Despite the remarkable rise of e-commerce and digital payment infrastructure in the country, the results from the survey suggested that certain groups of the population were still wary of using digital financial services. The key reasons for not using digital financial services include a lack of knowledge about how to transact digitally, a lack of trust in terms of security, and the view that using cash is more convenient.

Against this backdrop, financial institutions have been urged to raise their system security standard and capabilities to ensure accountability, continuity, and a pleasant user experience. Moreover, knowledge-building campaigns were recently introduced to gain customer confidence and create self-protection mechanisms against fraud or scamming by highlighting information such as security, and problem-solving guidance when there is an error or mistaken transaction.

## 4.5 Nudging Behavior through the Right Incentives

Providing the right incentives is a means to changing people's behavior. An example of this is when PromptPay started its operations. Positive responses from the public were due to various incentives, including (1) faster income tax refunds from the Revenue Department, if PromptPay was chosen as the channel for receiving a tax refund, and; (2) easy and fee-free cross-bank funds transfer. Another incentive that has recently been introduced to increase the use of digital banking and QR codes is the doubling of tax deductions for donations to educational institutions via the e-donation system, whereby donation recipients take donations via a QR code, and the information is sent directly to the Revenue Department. The impact of these incentives is substantial, as shown by the adoption rate of PromptPay and the change in user behavior described in Part III.

Suitable incentives should involve clear communication, however. The right story, being told at a wrong time, by the wrong person can lead to negative consequences. Some merchants recently became wary of using PromptPay and QR codes, owing to their misunderstanding that PromptPay would permit the government to investigate their income for higher tax collection. Fortunately, the situation was soon resolved, as the government swiftly responded by clarifying its intention to the public, guaranteeing that PromptPay users would not be taken advantage of.

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