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Framing the Issues: The Future of Finance in Thailand

John Schellhase and Staci Warden

MILKEN INSTITUTE

INTRODUCTION

In Southeast Asia, technological innovation is rapidly changing the financial services industry. Enabling factors such as steady economic growth, a large population and youthful demographics, rapidly expanding internet and smartphone penetration, and the proactive stance of a number of national regulators have led investors to direct approximately US$1 billion into the financial technology (FinTech) sector since 2013.[1] At the same time, large technology firms—ranging from e-commerce giants to ride-hailing apps—are leveraging the power of their data-rich consumer platforms to directly offer financial products to their millions of users. Throughout the region, policymakers and traditional financial institutions are grappling with the consequences of these developments.

Thailand is well-positioned to capitalize on the new developments in FinTech. The country has seen rapid growth in mobile and internet penetration, with internet access increasing from 67 percent of the population in 2017 to 84 percent a year later.[2] Thailand also has one of the strongest regional track records in improving access to finance, with 97 percent of the population either banked or with access to formal financial services offered by other providers.[3] More fundamentally, perhaps, Thailand has the largest number of software and app developers among the Association of Southeast Asian Nations (ASEAN).[4]

Recognizing the promise of FinTech innovations for access to capital and financial inclusion more broadly, the Bank of Thailand (BOT) has taken a leading role in creating an enabling environment for FinTech expansion in Thailand. This work has included organizing the 2018 Bangkok FinTech Fair, advancing a National e-Payments Master Plan, and establishing a FinTech regulatory sandbox.[5]

[1] For more on drivers of FinTech expansion and investment flows in Southeast Asia, see "The State of FinTech in ASEAN," United Overseas Bank Limited, 2017.

[2] See both the 2017 and 2018 "Digital in South East Asia" reports from WeAreSocial & HootSuite.

[3] For example, microfinance institutions. See "FinScope Survey Thailand," FinMark Trust and National Statistics Office of Thailand, 2014.

[4] Thailand has an estimated 360,000 developers at present—over 100,000 more than the nearest ASEAN competition—and is expected to maintain its lead for the foreseeable future.

[5] See Appendix 1 for a timeline of select FinTech developments in Thailand.

Likewise, the Securities and Exchange Commission and the Office of Insurance Commission have launched sandboxes to promote the growth of the FinTech sector. Meanwhile, 14 Thai commercial banks have recently established the Thailand Blockchain Community Initiative to apply distributed ledger technology to trade finance. These activities are just a few examples of developments within the Thai FinTech sector.

To explore the implications of technical innovations in the Thai financial services sector, the Bank of Thailand and the Milken Institute convened a day-long roundtable on March 30, 2018, titled, "The Future of Finance." The event marked part of a year-long celebration of the Bank of Thailand's 75th Anniversary and brought together senior Thai policymakers, regional regulators, technology experts from leading international FinTech companies, Thai banking executives, and financial-sector development specialists for an open discussion structured around three main topics: the new technologies and companies reshaping the financial landscape; the response of traditional financial institutions, both competitive and cooperative; and the challenges facing Thai policymakers and regulators as they work to encourage innovation while ensuring financial stability and customer protection.

To frame the day-long discussion, Dr. Veerathai Santiprabhob, the Governor of the Bank of Thailand (BOT), laid out three imperatives that should guide FinTech policymaking and private-sector innovation in the Thai financial services industry: productivity, inclusivity, and immunity/resilience. As he explained, "Financial services need to be efficient and productive in order to raise the productivity of the economy as a whole," but productivity is not sufficient if financial services do not reach the majority of the population.[6] "The public at large needs to be able to have access to a wide range of affordable financial services," he said, "so that they can unlock their potential and have lifelong financial security."

[6] To encourage a candid discussion, the roundtable was held under a shared understanding that participants would be able to report on the ideas presented during the discussion but may not publicize the name or affiliation of individual speakers. In two cases, though, the identity of the speaker adds special significance to what was said, and so after the roundtable, the Milken Institute requested and received permission to attribute some specific remarks to the participants who made them. One of those speakers was Sopnendu Mohanty, the Chief Fintech Officer of the Monetary Authority of Singapore, whose ten principles for developing a digital economy are captured in Appendix 2. The other was the event's principal host, Dr. Veerathai Santiprabhob, the Governor of the Bank of Thailand.

But at the same time, he warned, financial services cannot innovate at the expense of financial stability. He cautioned, "The aspiration for improving financial technology should be to help improve risk management and create resiliencies for the financial system."[7]

What follows is a summary of the ideas, recommendations, and outstanding concerns shared by roundtable participants, based on the Governor's broad call to action. This resulting Framing the Issues report is organized into four sections:

New Technologies and Their Impact on the Competitive Landscape: What is the competitive threat for financial-sector incumbents from new entrants into the market, including disruptive FinTech startups and TechFins (large technology firms moving laterally into financial services)? Can incumbent banks survive, and if so, what will they need to do to respond?

The New Cooperative Landscape? Will the future competitive landscape for banks and FinTech/TechFin firms actually become cooperative? What are the opportunities and challenges for bank-FinTech and bank-TechFin collaboration? What opportunities does an "open banking" approach enable?

Catalytic Public Infrastructure: What investments can governments make to enable a digital service economy and the wider deployment of financial technologies? Roundtable participants discussed the experiences of both India and Singapore, as well as recent developments in Thailand.

Smart Regulation in the Age of Financial Innovation: How can regulators best achieve their mandate when financial institutions and financial products are rapidly evolving? What are the most important principles for effective regulation in this new century?

[7] For further insight into the Governor's thinking about these three imperatives for FinTech policymaking, see his public speech from March 19, 2018, "Opening Remarks: BOT's Policy Direction on FinTech Development," available here: https://www.bot.or.th/Thai/PressandSpeeches/Speeches/Gov/SpeechGov_19Mar2018.pdf

NEW TECHNOLOGIES AND THEIR IMPACT ON THE COMPETITIVE LANDSCAPE

Roundtable participants agreed that the banking sector in Thailand needed to do more to improve both its productivity and the financial inclusion of Thai citizens. While about 80 percent of Thais have access to deposit services, for example, less than a third of the population has access to credit. Cash is still the dominant method of payment, with the cash-handling costs for Thai banks amounting to hundreds of billions of baht annually.[8]

Banks, moreover, have failed in many cases to make the needed investments to become more productive and efficient. On the one hand, they are unable to capitalize on the extensive and valuable data they have in their customer records, both because the data are not digitized (and are therefore unsearchable) and because banks have not invested in the required machine-learning tools. On the other hand, they lack access to the massive amounts of consumer data that are housed on social media and other platforms.

As a result, both innovative FinTech startups and TechFins—large technology firms leveraging their massive user bases to move laterally into financial services—are encroaching on traditional banking turf by deploying advanced data-gathering and analysis techniques to better serve customers. At the same time, new technologies have enormous potential to help banks close these gaps and become more responsive to evolving consumer expectations. This section describes the impact of new players on the financial sector and the potential for banks to respond and compete.

NEW PLAYERS THREATEN TRADITIONAL BANKING: THE ARRIVAL OF FINTECHS AND TECHFINS

Investors appear to recognize the potential of new technologies to transform financial services in Southeast Asia.

[8] At the end of 2017, over 90 percent of transactions in Thailand occurred via cash, according to the Thailand e-Payment Trade Association. A study from Asian Banker Research showed that the costs of cash management in Thailand come mainly from labor associated with refilling and maintaining ATMs, as well as the opportunity costs of holding excess cash. According to one roundtable participant, a 30 percent reduction in the use of cash would result in a 180 billion baht (about US$5.6 billion) savings for Thai commercial banks.

NEW TECHNOLOGIES AND THEIR IMPACT ON THE COMPETITIVE LANDSCAPE

As shown in Figure 1, the ASEAN region has attracted about US$900 million in FinTech capital investments across 289 deals since 2013. While less developed than the main regional hub in Singapore, the FinTech startup ecosystem is growing in Thailand. The Thai FinTech Association, founded in 2016, currently boasts 105 members, including 61 startup companies.

At their best, early- and growth-stage FinTech startups excel in identifying and exploiting inefficiencies in financial services through the application of new technologies. They often offer consumers an online or mobile experience that is far more user-friendly than working with a bank. Likewise, their solutions can often expand access to financial products to traditionally excluded consumers. Many Thai FinTech startups, for example, are working on peer-to-peer lending platforms to connect small-scale lenders and borrowers.

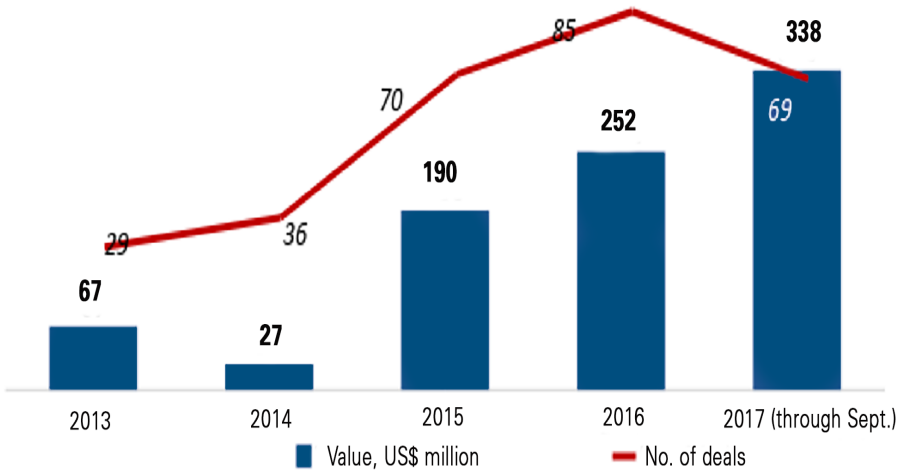
Despite the growth in the sector and the amount of capital invested in FinTech startups, it would be an error, one participant argued, to view the startup ecosystem as the main disruptive threat for traditional financial institutions. "It is a small number of startups," this participant said, "that seek to meaningfully disrupt or disintermediate traditional banks, insurers, and asset managers," adding that, "the vast majority of FinTech companies want to sell into incumbent banks." They apply enabling technologies to improve current banking processes and aspects of the traditional customer experience with the main goal of being acquired. The competitive risk to traditional financial institutions, this participant and others argued, lies elsewhere, among the TechFins.

The biggest players in the TechFin space are Chinese. Examples include the Alibaba Group, a massive e-commerce company with a US$500 billion valuation that originally introduced financial services for its users in order to facilitate escrow payments, building its own e-payments infrastructure in order to do so.[9] Then, in 2016, the Alibaba Group launched Ant Financial, a separate financial firm that

[9] The founder of the Alibaba Group, Jack Ma, is commonly credited with coining the term "TechFin."

operates Alipay, a payment network of more than 600 million users, which also offers credit products to Alibaba users through its WeBank platform.[10] Another Chinese tech giant, Tencent, has leveraged its extensive messaging and gamer user base to launch Tenpay, a payments platform that processes between 20 and 30 percent of all online payments in China.[11]

Figure 1. FinTech Investments in ASEAN, 2013-2017



Source : "State of FinTech in ASEAN," United Overseas Bank (UOB), 2017.

As roundtable participants noted, TechFins have several advantages compared to both FinTech startups and financial services incumbents. Compared to FinTechs, TechFins enter the marketplace with established economies of scale. Given their size, experienced management, and the fact that they are cash-flow positive, they are also able to raise capital much more easily than FinTech startups. TechFins' advantages over banking incumbents include deep technical know-how—particularly in data analytics and machine learning—as well as access to the best technical talent. As a result of these advantages, one participant emphasized, "these companies can grow very big, very quickly."

One of the defining aspects of TechFins is their power as platforms to offer various types of products, often from various providers, to their universe of users.

[10] Ant Financial is also now the world's largest consumer wealth management platform company, with US$345 billion in assets under management. See Henny Sender, "Ant Financial extends dominance in Chinese online finance," *Financial Times*, May 17, 2018.

[11] For more on TechFins, see this influential paper from the European Banking Institute: "From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance," Zetsche et al., EBI Working Paper Series, No. 6, 2017. As for TechFins outside of China, roundtable participants cited Singapore's Grab and Indonesia's Go-Jek, two ride-hailing apps, as ASEAN-based TechFins that have seen impressive growth in recent years.

As one participant said, "We're talking about the borders between players coming down, and the borders between products are also coming down." As massive product platforms, TechFins are able to harness vast amounts of data to construct a more holistic financial picture of their users. These data allow TechFins to capitalize on marketplace dynamics and network effects at a scale for which FinTechs and traditional banks are simply unprepared. As a result, several participants argued, an increased prominence of platforms within financial services would be one of the most significant drivers of change for the industry.[12]

[12] By platforms, participants were referring to "any intermediary layer through which first- and third-party services are offered to consumers," as one person explained.

INCUMBENT BANKS: DOWN AND OUT OR ABOUT TO STRIKE BACK?

The main threat for financial incumbents in Thailand, as expressed by several roundtable participants, was that if they did not quickly embrace the changes enabled by new technology, they would lose a generation of consumers to their FinTech competition. In the wider ASEAN region, 44 percent of the population of over 650 million people is under 25 years old. "People under 25," one participant said, "are not going to old-school, brick-and-mortar banks to get their banking done. This is a new world."

Thai participants also worried that banks were not meeting the demands of customers whose expectations are now set by the widespread adoption of smartphones. According to one participant from the Thai banking sector, consumers expect all services, including financial services, to become increasingly "easier, better, and more secure." As another Thai participant said, "Banks are no longer defining what it is that their customers can expect in terms of experience in financial services. Technology is defining that."

Another participant questioned whether banks "can truly depend on their customers, even now." He argued that a massive loss of the consumer market was not a far off prospect, but an imminent threat. "The idea that banks can somehow renegotiate the customer contract is fantastical at this stage," he said. "They only have customers now because customers have nowhere to go."

He pointed out that the switching costs for moving from one bank to another are high and the differentiation of the quality of offerings between banks is negligible. "But what happens," this participant continued, "if you can suddenly perform bank-like services through platforms where consumers are already highly engaged?" For example, if consumers in Thailand were able to move money or access microfinance services on social messaging platforms such as WeChat or WhatsApp, a behavioral change could occur incredibly quickly.[13] If this transition is inevitable, as it appeared to be to several roundtable participants, the banks may have already lost the war.

But not everyone agreed. One participant from an international technology firm made the opposite case. "This is the era of the incumbents," he said. "The incumbents strike back." The foundation of his argument was that banks currently have a vast amount of data from their customers. If banks can make use of those data "to provide services to the customers in a far more personalized manner," their other innate strengths—brand recognition, trust and reliability, and their well-established clearing and settlement infrastructure—will enable them to fend off incursions from both FinTechs and TechFins.

The main obstacles for this kind of internal transformation, as identified during the roundtable, are the lack of technical talent in the banking labor force and the ingrained corporate culture of traditional banks. The talent issue is particularly relevant for smaller and more rural banks, which do not have the resources or the proximity to the metropolitan talent pools needed to hire expensive tech-savvy teams.[14] But even hiring the best technical talent does not ensure transformation, participants noted. One participant argued, "Tech experts will only ever make up a small percentage of the full workforce that will need to embrace and implement any new technological solutions." As another participant said, "The minimum requirement is commitment and will from top management. But often we find that even this is far from adequate because down the line of operations there is a level of resistance against change that is

[13] Though not explicitly stated at the roundtable, the potential for this transformation is particularly high in Thailand, which has one of the most active mobile-internet user bases on the planet. According to research from Google, Thais spend about 4.2 hours on the mobile internet each day, about double the amount of time Americans spend and four times as much as the Japanese do.

[14] As one participant noted, innovative work with financial technology requires hiring not just one expert, but a whole team.

far from adequate because down the line of operations there is a level of resistance against change that is natural, obvious, and very powerful."

THE POTENTIAL FOR NEW TECHNOLOGIES TO HELP BANKS COMPETE

A recurring theme of the roundtable discussion was that while banks may be the institutions most threatened by these disruptive technologies, they also have the most potential to gain from their deployment. Participants agreed that new financial technologies will have powerful effects on both business and retail banking, due to their potential to reduce costs, enable better credit assessments, increase payments and other efficiencies, and provide a myriad of ways for improved customer experience. As one participant said, "If you were to ask which are the main technologies that are likely to drive change, then you only have to look at what the FinTech companies in Thailand and elsewhere are focusing on and trying to develop." This list, he said, would include blockchain, chatbots, machine learning, cryptocurrencies, and financial applications for the internet of things (IoT).

In Thailand and around the region, banks are quickly adopting these kinds of potentially threatening technologies. For example, the ability of blockchain to disintermediate transactions between two parties that have no reason to trust one other "challenges the underlying assumptions that allow our industry to exist," as one participant from the Thai banking sector said. At the same time, Thai banks have responded to this possibility by working together to integrate blockchain into their current lines of business through the Thailand Blockchain Community Initiative.[15] The partnership will bring letters of guarantee (LGs), among the most common contracts in trade finance, onto an industry blockchain in order to reduce counterfeiting and dramatically cut costs.[16]

Likewise, chatbots are enabling banks to advance the first two of the Governor's three imperatives: efficiency and inclusion. In terms of efficiency, deploying chatbots is far cheaper than establishing a call

[15] The group will begin moving a small percentage of the 500,000 LGs issued annually in Thailand onto a permissioned blockchain. Kasikornbank, one of the country's largest banks, previously announced a target of having 5 percent of LGs on the blockchain by the end of 2018. If this goal were achieved industry-wide, it would mean approximately 25,000 contracts, worth a cumulative amount of about US$2.1 billion, would exist on the banks' blockchain platform.

[16] If all LGs were moved to the blockchain platform, banks estimate operational costs would be cut by half. See "Press release: The first Thailand Blockchain Community Initiative," Kasikornbank, March 19, 2018.

center or building a physical network of brick-and-mortar branches. To emphasize this point, one participant pointed to the recent decision of Siam Commercial Bank (SCB), Thailand's third largest bank, to reduce the number of branches to only a third of their current number by 2021. "Clearly," this participant said, "SCB is not intending to interact less with their customers. They're planning to interact more. The only way they're going to be able to do that is through technology and through the use of chatbots." Another participant remarked that her Singapore-based bank was only able to enter the market in India because of the operational cost reductions made possible by chatbots. "Our chatbot handles 80 percent of incoming calls," she said. "It allows the bank to operate with less than 25 percent of the operational capacity that we would typically need to run a consumer bank."

These productivity gains, participants noted, have the potential to expand financial inclusion, particularly among underserved populations and in rural communities. As an example of this dynamic in practice, one participant pointed to the Chinese province of Inner Mongolia, where a small regional bank has partnered with a large FinTech company to develop interactive electronic kiosks to expand financial access to remote farmers. The kiosks run a chatbot that allows farmers to learn about and apply for financial products. The bank receives a notification and can then send a representative to follow up when needed. As the participant who described the project concluded, "This is people plus technology."

Roundtable participants also highlighted the potential for machine learning to drive better efficiencies and customer experience in the banking sector. According to one participant, machine learning will be "the main driver for the ability of banks to reduce fees." He pointed out that Kasikornbank, a large commercial bank in Thailand, has already successfully lowered payment and transfer fees based on machine-learning processes. Other applications for the financial sector include improved credit assessment, risk management, fraud prevention, securities trading, and cybersecurity.

Even business decisions around human resources could be enhanced through using machine learning to predict attrition and deepen employee engagement.

Effectively deploying these new technologies, though, will not be easy. For one, it will require that banks make significant internal investments in machine learning and artificial intelligence in order to find marketable insights in the large datasets they already possess. Beyond just investing in technology, some participants argued that banks must go further to "disrupt themselves." These participants spoke of the need for banks to transform themselves from bureaucratic to more agile institutions. While arguing for more pilot programs to test new technologies, one participant said, "We need to adopt the mindset of the FinTechs: We have to 'fail fast.'" He added, "Simply put, we should disrupt ourselves. Otherwise, someone will do the job for us."

THE NEW COOPERATIVE LANDSCAPE?

Given the myriad new technologies and players driving change in the financial industry, Governor Santiprobhob asserted, "The key question for our roundtable discussion today becomes, who should be responsible for shaping the future of our financial markets?" He noted the traditional answer to this question would be the big banks and the regulators, but increasingly, "FinTech and TechFin firms are seeking to take part in laying the foundations for the future of the financial sector." The Governor added that the answer to his question could come in the form of collaboration among these various stakeholders. He hoped they would work together toward the three imperatives he had outlined, and they would do so "through building and sharing a common infrastructure, developing interoperable standards, and partnering with one another."

As roundtable participants took up the Governor's question, the discussion centered on whether or not fruitful and sustainable collaboration between banks and FinTechs, as well as between banks and TechFins, was possible—and to what extent. As noted above, some participants argued that banks would suffer from lack of competitiveness in this new environment. Others countered that due to the industry's intrinsic strengths the banking sector was entering an "incumbents strike back" period. Others still made the case that there is enormous opportunity for collaboration across a range of players, including among banks themselves.

As one participant noted, "Something has changed in the Thai financial sector during the past few years. It's not just one single bank striking back. It's the banking community striking back together." Until recently, this participant explained, Thai banks were reluctant to cooperate and share information unless pushed to do so by regulators. However, perhaps recognizing the competitive danger posed by FinTech challengers, the industry is becoming more

collaborative, with much of the credit going to new leadership at the Thai Bankers Association (TBA), according to the roundtable discussion. This new spirit of cooperation has already resulted in important concrete developments. Roundtable participants cited the development of Thailand's PromptPay payments platform, which the TBA has estimated will save commercial banks over US$2 billion over the next decade.[17] Other achievements include the adoption of a national standardized QR Code payments system and, as discussed above, the blockchain partnership for trade financing.

[17] See Chanyaporn Chanjaroen, "Thai Digital-Payment System May Save Banks $2 Billion," Bloomberg, January 24, 2017.

Given the rapid pace of technological change, however, some at the roundtable believed partnerships between traditional players would always be insufficient. FinTech companies, they noted, are building solutions across the full value chain of banking operations, products, and marketing. "The application of technologies is changing so fast at this stage that there is no way for one or several banks to build all the technologies in-house," one participant said. "There is no choice. They have to cooperate with different companies and startups."

COOPERATION BETWEEN TRADITIONAL BANKS AND FINTECH FIRMS

Bank-Fintech collaboration could be a win-win for both parties. FinTechs have the talent, the proprietary technology, and, as an ecosystem, a wide scope of various solutions that meet evolving consumer demands and improve banking back-end operations. Incumbent banks, though, have the ingredients needed to make FinTech products scalable, including a large customer base, rich customer datasets, well-developed risk management capacity, and the backend operations to meet anti-money laundering and combating the financing of terrorism (AML/CFT) standards.

While in agreement as to the potential for Bank-Fintech collaboration, the roundtable discussion identified a number of challenges for such partnerships. From the banks' perspective, FinTechs prove to be difficult partners for two main reasons:

quality control and scalability. In regards to the first, some participants worried that partnering with FinTech firms would introduce new risks and legal liabilities into the banking business, particularly around data privacy and storage. As one participant explained, "Many of these FinTech companies are not particularly impressive. The reality is that for all the hype around many FinTech startups, the vast majority lack any identifiable IP and indeed bring with them a variety of risks such that banks are in many instances appropriately cautious." In addition to these issues, banks worry about the continuity of operations of potential partners. Startups are risky, and they fail for a variety of reasons. What happens if they are forced to shut down after their technology has been heavily integrated into a bank's systems?

Even for reliable FinTech firms with strong data management policies, the issue of scalability remains. FinTechs are typically small firms focused on narrow solutions, and they are often building their user base from the ground up. These qualities help them to be agile and innovative in response to user feedback. However, this can also mean they are not ready to deploy their solutions at the scale banks require. As one roundtable participant from the banking sector explained, "As we test and start distributing a solution, many times we find that the FinTechs will not be able to scale up to the volumes that we are looking at, especially in the big geographies." In part, this same participant added, the scalability issue arises because of the difference between how banks and FinTech firms think about solving problems. When it comes to partnering with FinTech startups, she observed, "The cultural-management fit is also important. We sometimes find that our agenda is very broad, whereas for specific FinTechs the agenda is actually about going down very deep."

For their part, the FinTech companies have their own complaints about the complications of working with banks.

The main concern raised at the roundtable was that attempting to partner with a bank required opening simultaneous, extended dialogues with numerous departments—treasury, compliance, product development, and so on—none of which communicates reliably well with the others and none of which has the final authority to sign-off on a partnership. "When you have to work with a bank, it's like *The 36th Chamber of Shaolin*," said one participant, referencing the classic Kung Fu movie in which novice fighters proceed through multiple chambers, learning a new combat skill in each one.

This challenge, combined with the lack of technical ability and the resistance to change found in many traditional banks, led one participant to conclude, "In general, banks are structurally incapable of working with smaller players in any meaningful way. The reality is that if we think that bank-FinTech partnerships are what the future looks like, we're in for a rude awakening." Several other roundtable participants were more cautiously optimistic, noting that traditional banks and FinTech firms are natural allies, not rivals, and that the emergence of open-banking platforms would do much to engender profitable collaboration, a subject discussed in more depth below.

COOPERATION BETWEEN TRADITIONAL BANKS AND TECHFIN FIRMS

Instead of bank-FinTech partnerships, future financial-sector collaboration, according to various participants, will more likely involve TechFins, as they use their massive economies of scale to become platforms for other service providers, including banks. Working with TechFins could have many potential benefits for banks—particularly for small, rural ones—as they would be able to integrate their services into popular, highly developed online platforms. For their part, TechFins will likely need banks to provide bank-end services for their own branded financial products. This kind of partnership—which may be inevitable, some argued—would threaten banking margins and likely require an increase in banking efficiency.

As one participant argued, "It has been a misunderstanding for several years that the TechFin platforms seek to replace incumbent institutions. Platforms need banks to do the heavy lifting of banking, while they sit on top and offer a range of services, typically at a higher margin." In other words, the consumer-facing aspects of marketing products and managing the user experience would be run by the platforms while the operational infrastructure, holding of deposits, loan-making, and compliance with financial regulations would continue to be the business of banks. This approach would be particularly appealing to many large technology companies, which instead of building their own payments networks as Alibaba did, will likely rely on banks to support the introduction of financial products on their platforms.

There are problems to this model, though. The first, as more than one participant noted, is that this role as a utility for a social media platform, for example, would represent a significant and, in most cases, undesirable change for banks themselves. One participant explained that under such circumstances banks would need to be much more efficient than they are currently because of the cut in their margins. At the same time, they would have to be sure to control the risk management processes of the platform as a whole. "If we democratize the transactions part," one participant explained, "all the risk associated with lending remains with the bank." Right now, this participant argued, these platforms are evolving in a historically low interest-rate environment, but as rates increase, defaults will likely increase as well and the banks, not the platforms, will incur the losses.

Moreover, the regulatory and other incentives for TechFin firms may mean that they will inevitably be pushed to offering their own first-party products exclusively. This will happen, several roundtable participants argued, as platforms become more integral to consumer finance and as they face increasing pressure to stand behind the quality of all products they offer, whether first-party or third-party.

This pressure will come from consumers, insurers, and regulators. Regulatory issues will be especially complex for platforms offering services internationally. These companies will need to comply—and will likely need to enforce third-party compliance—with the legal requirements of multiple jurisdictions. As one participant said, "Global or even regional platforms will come under considerable pressure as a consequence of various national regulations, particularly as it pertains to data privacy, data security, and cross-border data flows."

The upshot of these various pressures, one participant added, will likely be that over time "platforms will be incentivized to manufacture more of their own products—that is, to offer first-party products at a preference over third-party ones. Ultimately, this will mean they transition increasingly to being traditional financial services companies, with all of the capital adequacy requirements and regulatory oversight that this entails." In other words, the companies threatening to replace banks may begin to look more like banks themselves.

Another vision of the future (perhaps not mutually exclusive to the above) would be that banks themselves operate their own platforms and aggregate financial products of other companies alongside their own first-party offerings. Many banks may wish to do so because they do not have the internal capacity to leverage new technological developments to deliver better products to their customers and improve internal processes. "Every piece of the bank's value chain," one participant elaborated, "back office, middle office, and front office, would be unbundled to small components," each of which can be optimized by financial technology developed outside of the bank itself. But if banks need to partner with hundreds of small players, as one participant suggested, in order to fully realize the potential of new technologies, the banking industry will need a new kind of infrastructure to manage those relationships.[18]

[18] Several participants pointed to DBS Bank in Singapore as a model of how banks could benefit from open banking. At present, DBS has published APIs for developers for various aspects of their business, including accounts, reference data, payments, and sales. See the full list here: https://www.dbs.com/dbsdevelopers/discover/index.html

AN OPEN BANKING APPROACH CAN LOWER THE COSTS OF COOPERATION

To harness the full range of new technologies, banks could develop what one participant called "a platform-like architecture" through publishing open APIs (application programming interfaces). Open APIs are publicly available guidelines that enable third-party software developers to create programs that can access and interact with an organization's proprietary software and data. When this approach is applied in the banking industry, it is often referred to as "open banking," and a number of roundtable participants—representing banks, FinTech firms, and regulators—saw it as an attractive path forward to foment collaboration across industry players. They argued that open banking would increase industry efficiency from both the bank and FinTech perspective and would enable banks to easily embed the consumer-friendly technologies of their competition into their own retail products and marketing.

As participants also noted, the question for Thai regulators will be how much to encourage or even force the financial sector to move towards this kind of collaboration. As captured in Box A, participants pointed to Japan and Singapore as examples of countries where policymakers have actively promoted the open-banking approach.

Several roundtable participants argued that the main benefit to this module-approach is cost savings. For FinTechs, open banking provides a far clearer indication of whether their solution will work without fighting through "the chambers of Shaolin." For banks, having a standardized set (or sets) of programming rules for external developers enables partnerships with a variety of parties without having to reinvent their own systems each time. One participant used Lego blocks as a metaphor for how easily applications developed by FinTech firms could snap onto the banks' systems. Furthermore, this same person argued, the open API architecture helps banks reduce the quality-control concerns about FinTech companies discussed above.

"It really does not matter whether the FinTech plugging in to the architecture is mature or immature. If they are not up to the mark once they plug-in, the banks just take them out. The cost of building in and building out is dramatically reduced."

Box A. Policy Development Case Studies: Open Banking in Japan and Singapore

Recognizing the potential of open banking to increase productive collaboration between traditional banks and FinTech firms, policymakers in Japan and Singapore have moved quickly to enable and encourage the use of open APIs in the financial industry. The Japanese approach has been to require FinTech firms register with regulators in order to access bank APIs. In Singapore, the Monetary Authority of Singapore (MAS) has taken a proactive and holistic approach to accelerate open banking and has created an API library for the industry.

In June 2017, the Japanese legislature amended the Banking Act to enable the use open APIs. The new rules require FinTechs that wish to participate in open-banking partnerships register with the Financial Services Agency and meet certain information-preservation and data-privacy standards. According to information shared at the roundtable, 122 out of the 139 Japanese banks have signaled their willingness to publish APIs.

In Singapore, the MAS and the Association of Banks in Singapore came together in 2016 to publish Finance-as-a-Service: API Playbook, a nearly 500-page guide to how financial incumbents and FinTech startups could deepen collaboration through open APIs. Today, the MAS maintains a Financial Industry API Register, a set of open APIs that developers can access. Importantly, as one participant noted, banks that have not yet developed their own APIs can call upon those included in the registry as models. Updated semi-annually, the register included 272 APIs at the end of 2017, as published by four banks, an online payments operator, and the regulator itself.

Box A. Policy Development Case Studies: Open Banking in Japan and Singapore (cont.)

The table below shows the number of APIs currently available on the register across various categories.

Breakdown of APIs Available on Singapore's Financial Industry API Register

Functional Category	Transactional	Informational
Transactions	52	18
Servicing	28	26
Sales & Marketing	25	19
Product	2	46
Others	3	12
Regulatory	-	42
Total	**109**	**163**

Source: Monetary Authority of Singapore, updated as of November 2017.

Perhaps equally important, by eliminating some of the barriers to collaboration with FinTechs, open banking may allow banks to re-introduce themselves to customers.

Referring to the threat of customers switching to platforms for financial services, one participant from the banking sector said, "That is precisely why we feel that embedding ourselves into the customer's journey is now paramount." She said banks "have to make it as easy as possible" for customers to find and access their services and argued that an open API framework gives banks the expanded scope of FinTech tools for them to do so.

However, even the open-banking evangelists at the roundtable recognized that the transition will be difficult for many traditional banks. "We cannot trivialize it," one participant said. "It's hard. It's not putting on digital lipstick and saying, 'I'm a digital bank.' The bank really has to transform from the back to the front."

The bank really has to transform from the back to the front." And this kind of transformation, participants suggested, runs up against the same issues of traditional corporate culture discussed above.

In general, roundtable participants seemed to agree that pursuing an open-banking model for the financial industry would require a new regulatory approach. For instance, one participant called for regulatory standards for API documentation—that is, standards for the technical reference manuals banks would publish that describe how FinTechs can interact with their APIs. Another participant, noting that open banking does not eliminate the data stewardship issues of working with startups, recommended that governments draft regulations on what kinds of APIs can be used in the financial industry. Another recommended inviting banks and FinTechs to experiment with this approach in a controlled regulatory sandbox "to show they are capable of building on this architecture in a way that is compliant with what regulators need."

CATALYTIC PUBLIC INFRASTRUCTURE

A number of roundtable participants asserted that accelerating the adoption of platform-scale technologies and promoting a digital services industry will require proactive government involvement beyond simply creating an enabling regulatory environment. As an example of expansive public-sector action, several participants pointed to India, where the government has made dramatic investments to move services, including financial services, online.

THE INDIAN EXPERIENCE

The Indian government wanted to make a dramatic advance in the efficiency and efficacy of resource allocation, particularly in regards to government payments. As one roundtable participant who has worked with the Indian government on its FinTech infrastructure explained, "Most of the population is dependent on the largesse of the government, and so distributing subsidies and welfare to citizens is a key question." Indian policymakers believed technology, implemented on a national scale with full state backing, could lead to dramatic cost savings in distributing government assistance, while also improving service delivery throughout the economy. And with this vision, the government actively built a digital architecture, known as the India Stack (see Box B), which is reducing the time and cost it takes to access a variety of services, including financial services.

As a result of building this catalytic public infrastructure, this same participant argued, banks and other financial service providers have been able to expand access to their products to Indians farther down the socioeconomic ladder. "Earlier in India," he explained, "if someone wanted to get a loan below a certain ticket size, the formal financial institutions were simply not interested. It would cost them more to acquire those customers and to service them than they would get back in return."

After the creation of the India Stack, however, the costs of originating a loan have dropped by over 90 percent, according to information shared at the roundtable.

Box B. The India Stack

The foundation of India's digital architecture is the Aadhaar unique identification system. Combining basic information such as name, date-of-birth, and address with biometric information, including fingerprints and iris scans, the Aadhaar platform launched in 2010 and has already enrolled over 1 billion Indian citizens. "In six years and three months," said one roundtable participant who has worked with the Indian government on its FinTech infrastructure, "we went from zero to 1 billion. That is faster to the first billion users than Facebook."

Aadhaar in turn allowed for the creation of the other layers of the India Stack, such as electronic know-your-customer verification (eKYC), electronic document signatures, individual consent for data usage and transfer, and an inter-bank payment protocol called the Unified Payment Interface that links mobile money and digital payments systems to the traditional banking infrastructure.

The reason India has acted so quickly to build the various layers of the India Stack and to keep them interoperable, according to the participant who worked closely on these issues, is "fundamentally a question of intent and political will." Given the goal of promoting cash-less, paper-less, presence-less transactions and services in a relatively poor and incredibly diverse country, the government took on the responsibility of building the infrastructure required.

BUILDING A NATIONAL FINTECH INFRASTRUCTURE IN THAILAND

Government involvement in the financial sector is not new in Thailand. As noted above, Thailand has among the highest levels of financial inclusion in the region, and this is owed in large part to government initiatives such as the Village and Urban Revolving Fund microcredit initiative and the creation of the Bureau of Financial Inclusion and Policy Development in 2011. As one study from the Asian Development Bank concluded, "Thailand's approach to financial inclusion is also unique in the sense that unlike other countries, the pursuit of inclusive finance is primarily driven by the government—and with significant results."[19]

The Bank of Thailand, as highlighted throughout roundtable, is again leading efforts to develop the financial sector, this time through developing the National e-Payments Master Plan. This work has included establishing the PromptPay online payments platform, the adoption of a standardized national system for QR Code payments, and the development of e-KYC policies that enable individuals to open online financial accounts in compliance with know-your-customer provisions of Thai law.

Building on top of the PromptPay infrastructure (see Box C) launched in 2016, the BOT has developed a national Thai QR Code standardized system, enabling any smartphone user to make payments by scanning a merchant's QR Code. The simplicity of the method effectively leapfrogs the need for debit cards, and there has been discussion of expanding the service to credit accounts as well. Notably, the national QR Code guideline represents a successful exit from the BOT's e-payments regulatory sandbox, which provided the testing ground for the system before it was fully sanctioned by the BOT.[20] In the first six months after emerging from the sandbox, the QR Code standard has been adopted by over a million merchants, according to information shared at the roundtable.[21]

[19] See Financial Inclusion in Asia: Country Surveys, Asian Development Bank Institute, 2014, particularly Chapter 5, "Thailand's State-Led Approach to Financial Inclusion," by Yuka Terada and Paul Vandenberg.

[20] A regulatory sandbox provides an environment in which select financial firms can scale up production-ready FinTech products in a relaxed regulatory setting for a set period of time, while regulators are able to observe how consumers and businesses interact with the new products and are able to work with companies to determine how to address regulatory concerns about consumer protection and financial stability.

[21] Interestingly, though not discussed at the roundtable, the push for a national QR Code standard emerged as the result of the influence of Chinese TechFins. According to reports, QR Code e-payments services launched by Alipay and WeChat Pay have dramatically reduced cash-dependency in China. For more, see "Nationwide push for cashless society in Thailand," *The Star*, January 8, 2018.

Finally, the BOT is again working with banks through its regulatory sandbox to establish industry e-KYC standards. Once implemented, individuals will be able to open financial accounts online or via mobile apps without ever setting foot in a physical bank. This is accomplished through the use of biometric verification, similar to India's Aadhaar identification system.

The challenges for full adoption, according to one participant, include privacy risks and the limited IT capacity of banks and government institutions. However, she believed, the benefits of the technology "to enhance efficiency, inclusivity, and productivity will overwhelm those barriers."

Several participants noted that the efforts to build Thailand's e-payments infrastructure will have widespread impact on how Thai citizens access financial services. One participant highlighted what he called "a very significant local event" that occurred days before the roundtable—the decision by the largest Thai banks to reduce fees on all online and mobile transfers to zero. This participant credited this milestone to the combination of technology-driven competition, government action in the form of the PromptPay platform, and leadership from the private sector to embrace the change.

"Clearly," he said, "what is defining change is not traditional competition. It is not regulation in its old form, but it is change coming from technology. This brings us back to the question of who or what should be responsible for changing the financial landscape. Technology combined with regulation—not least as a result of the government and Bank of Thailand's PromptPay initiative—led to the kind of change that we want to see, which is the reduction of costs and greater access. From the FinTech perspective, this is happening. It's exactly why there is a FinTech industry."

Box C. PromptPay

PromptPay is the first payments infrastructure in Thailand to enable the transfer of funds using proxy IDs, such as the National Citizen ID or a mobile number, to identify the recipient of the funds. The system was developed by a company owned by commercial banks in close coordination with the Bank of Thailand. According to the BOT, the full rollout of the PromptPay platform is going to occur in two phases. In the first, the platform allows peer-to-peer transfers via bank websites, mobile apps, and ATMs. In the second phase, PromptPay services will be used to deliver government payments, subsidies, welfare assistance, and tax refunds. Additionally, the BOT and Thai commercial banks are working with authorities and banks in Singapore to explore the possibility for connecting the PromptPay platform and Singapore's PayNow system to facilitate cross-border transfers. One roundtable participant called PromptPay "a crucial shared infrastructure that will be the key driver for further financial innovation."

SMART REGULATION IN THE AGE OF FINANCIAL INNOVATION

Given the speed of technological change and the challenges facing traditional financial institutions as they attempt to adapt to the new environment, roundtable participants returned repeatedly to a fundamental question: What role should Thai regulators play in the evolution of the financial services industry?

In response to this question, several roundtable participants urged caution about early government interventions in the FinTech sector. They argued that premature policy decisions can derail valuable experimentation and hold back developments that would expand productivity and financial inclusion. These participants pointed to China, where a lack of government regulation enabled the rapid expansion of financial technologies led, in large part, by TechFin[22] firms. "It could be argued," one person said, "that the growth of some of the big Chinese players—Alipay and Tencent, in particular—that moved very aggressively and successfully into financial services was largely a consequence of a lack of regulation. A certain regulatory burden didn't exist for non-bank players." Another participant agreed, noting that the People's Bank of China and the China Banking Regulatory Commission are structured to focus on financial entities, not necessarily on financial activities. "The internet companies," she said, "are viewed as nonfinancial companies, and so effectively no one regulates them."

While acknowledging the Chinese experience, other participants noted that FinTech firms often prefer a clear regulatory structure. "From the industry side," said one participant from a blockchain company, "we actually welcome regulation. The key is to find the balance between heavy-handed regulation and a vacuum." As another participant noted, a regulatory hurdle helps distinguish legitimate players from FinTech startups with little to offer the industry. At the same time, one Thai participant explained, a sense

[22] In responding to this point, the participant who had worked on FinTech development in India noted that China was "much further along in their economic journey" than India. When Aadhaar was launched, Chinese GDP per capita was already over US$5,000, while in India it was still less than US$1,500. "The Chinese firms were able to grow faster," this same participant explained, "because of a strong consumer base that was already there." In India, though, the government had a larger role to play in supporting industry development.

of urgency to pass new legislation and reform regulations to address FinTech innovations has added additional stressors to regulators and industry participants alike. Due to the constraint on time, the most practical choice was to draft the new digital assets law along the same structure as the securities law and subsequently test out its application.

As they discussed regulatory questions, roundtable participants identified a number of other tensions that affect FinTech policymaking, both in Thailand and around the world.[23] In particular, they pointed out that disintermediation complicates policymaking that has traditionally been focused on regulating intermediaries; generational distrust sometimes corrupts the dialogue between policymakers and entrepreneurs; parties disagree on how to define investor protection; and the borderless nature of the supply and demand of FinTech products can frustrate national rulemaking.

From this discussion, participants suggested new principles for regulating in a fast-moving environment of financial innovation. These principles are elaborated below, followed by a small case study from the most recent frontier in financial innovation: the challenges of regulating cryptocurrencies.

THE PILLARS OF A FUTURE-ORIENTED REGULATORY POLICY

According to one roundtable participant, too much of the regulatory discussion—both in microcosm at the roundtable and in the wider policy discussions in Thailand during the preceding several months—had been focused on the problems facing the industry at the present moment. This participant argued that striving to fix today's problems would leave tomorrow's unresolved and encouraged those gathered at the roundtable to "look further into the future, maybe five years, 10 years from now." In that future, he asked, "what is the role of FinTech? What kind of environment do we want to create? Let's start the regulatory discussion from that vision."

[23] The discussion was held in the context of two pending pieces of legislation: the Draft Law on Business Promotion and Public Access to Services through Financial Technology (also known as the "FinTech Act") and the Draft Law on Digital Asset Businesses (sometimes also referred to as the "Cryptocurrency Act"). The former is still in the drafting process, while the latter became a law with full force and effect in May 2018.

Over the course of the roundtable, participants laid out what they saw as the pillars for a future-oriented regulatory approach. There was general consensus that, at a minimum, such an approach would have four components:

1) the regulation of activities, not entities

2) rules around data stewardship and data sharing

3) a responsive regulatory process that could keep pace with rapid technological change

4) regional cooperation.

Each of these potential pillars is discussed in greater detail here.

Regulating activities, not institutions: Throughout the roundtable, participants returned to the need for regulators to transform from regulating financial entities to regulating financial activities. As one participant explained, "The whole architecture of the digital economy is all about the unbundling of value." Both FinTech firms and TechFins are selecting the components of the traditional financial services industry they can best optimize and then offering consumers products formerly controlled by banks. "This unbundling," the same participant said, "leads to the need for activity-based regulation. Regulators will have to start looking at activities broken into small pieces and will need to start putting proportionate regulation for that small activity." As another participant said, "There needs to be more of a focus on what services are being offered, irrespective of how the business identifies itself."

This transformation, though, will require regulatory expansion, both of jurisdiction and of resources. To bring all of the small players under proper regulatory supervision, one participant predicted, regulators will likely need to require that more firms become licensed than they do today. And supervising the licensing process and the large number of newly licensed entities will likely require larger regulatory teams.

Likewise, monitoring the financial activity of TechFins and platforms will likely mean regulators need to invest in their own tech talent as well as their own data-processing and analytics power.

Eventually, changes in the industry will also necessitate a change in law to empower banking, payments, insurance, asset management, and markets regulators to properly oversee non-traditional actors moving into these fields. Legal overhauls take years, and so one participant encouraged policymakers to "conduct a cross-sectoral review of all financial regulations in order to anticipate the changes that will be needed."

Accountable data stewardship: The collection and analysis of unprecedented amounts of data underlie almost all of the technological advances discussed above. As roundtable participants noted, the data feeding into financial product development now includes personal information shared on social media platforms in addition to traditional deposit and credit data. In this new environment, participants agreed, a responsible regulatory framework should set rules for the use of consumer data.[24]

Several participants argued that the individual must remain the ultimate owner of his or her data. Financial institutions may use those data, with consent, to benefit the customer, but they do not in turn become the proprietors of the information. "If banks use data," one participant said, "to provide better service to consumers, that is acceptable, but taking their data and secretly selling it to others is something that should not be done."[25]

Taking this principle one step further, another participant suggested that consumers should have a greater ability to opt-in to data portability schemes so data provided to one organization can be shared, even automatically, with others. Her point was that a shared data infrastructure—a common KYC platform, for instance—would introduce greater competition into the financial services industry

[24] One participant pointed to IBM's guiding principles for AI as a good model. IBM emphasizes that AI development should be guided by 1) purpose, with decisions made for the benefit of end users; 2) transparency of what data are used and how data analytics processes are created; and 3) human capacity investment, meaning ethical development of AI ought to also involve training human users on how to harness the technology..

[25] The roundtable discussion took place soon after revelations that personal data from millions of Facebook users had been inappropriately used for political profiling by Cambridge Analytica, a British political consulting firm.

and would empower consumers to make better choices by removing the frictions of creating new accounts by eliminating needlessly tedious paperwork. However, as might be imagined, the banks and broker-dealers tend to prefer to keep their data siloed, and some Thai banks have advocated against new data-portability laws. "Their thinking is still, 'Why should we help our competitors?'" this same participant explained.

The solution to some of this industry pushback would be a national data architecture built on a trusted digital identity along the lines of the India Stack. If the Thai government were to pursue a similar path, as it is doing already in some ways, data stewardship and security must be at the forefront of the policy debate, according to several people. The roundtable participant who had worked on the India Stack said, "Who owns the data? What kind of data do firms have access to? Proactively regulating these things in the beginning is something any government moving in this direction should do."

A responsive regulatory process: Roundtable participants generally agreed that the current process of legal and regulatory reform was inadequate to the pace of technological change. As one participant said, "Today, policymakers build policies around white papers, studies, and public consultations, with a three-year timeframe to get a policy right. But they no longer have the luxury of this longer-term approach. The technology is shifting at a faster rate than they can write their white papers." Alternative approaches proposed at the roundtable, each of which is explored below, included the expanded use of regulatory sandboxes, the establishment of self-regulating organizations, and the potential for using technology itself as a regulatory tool to make compliance automatic.

Regulatory sandboxes: "The right approach toward the future of finance," said one participant from the Thai FinTech sector, "should be experimenting before regulating." The regulatory sandbox approach allows FinTechs to conduct live marketplace experiments without worrying about running afoul of regulations.

The regulatory sandbox approach allows FinTechs to conduct live marketplace experiments without worrying about running afoul of regulations. At the same time, sandboxes give regulators a chance to learn about new technologies and consider how to interpret existing rules based on the practice of real companies, not on theory. The formal nature of the sandbox also provides a powerful venue for engaging the legal community as well as legislators to help address, as one participant said, the disconnect between laws written many years ago and cutting-edge technologies. Of course, as several roundtable participants noted, this approach has already born fruit in Thailand through the development of the QR Code national standard in the BOT's payments sandbox.

Self-regulatory bodies: Several participants suggested that one way to address the lag-time between industry innovation and regulatory response would be to empower the private sector to regulate itself. As an example of how this idea works in practice, participants pointed to the Japan Securities Dealers Association (JSDA) which, as its website says, "extensively regulates market intermediaries. Its self-regulatory functions encompass rulemaking, enforcement, inspection, disciplinary action, accreditation of sales representatives, and dispute mediation."[26] As a self-regulatory organization (SRO), the JSDA has the authority under Japanese law to determine acceptable business practices among members and to enforce national regulations, including through imposing penalties and, in some cases, expelling members from the association.

In another approach, several participants recommended something short of establishing legally empowered SROs. The private sector, they argued, should collaborate on the development of industry standards for FinTech innovation that address issues of transparency, inclusion, and financial stability, as well as technical issues of interoperability of platforms. Such standards could serve as the basis of future regulatory policy.

[26] "Association Outline," Japan Securities Dealers Association, available here: www.jsda.or.jp/en/about/

As one participant said, "Maybe the private sector themselves can sit together and think of what they can offer the government, instead of sitting back and accepting regulations as given. The government and the private sector look at each other as enemies. Why? That is not the way to the future we want."

An example of this kind of effort, according to roundtable participants, is the ASEAN Financial Innovation Network (AFIN). As defined in the AFIN Consultation Document, the initiative is "a collaborative network of banks, FinTechs, and non-banks in which participants can develop common approaches to business, regulatory, and technical challenges." AFIN also operations "an 'industry sandbox' in which participants can integrate and test applications with each other via a cloud-based architecture."[27] AFIN has become an important venue for the ASEAN Bank Association to engage with FinTechs and to discuss interoperability issues. An early principle of the initiative has been the potential value of granting regulators observer status within the network so that they can gain insight into potential risks posed by new technologies and into how industry players are working to manage those risks. No ASEAN regulator has yet acceded to an official observer status, but AFIN plans to proactively reach out to them as the association matures.[28]

Policy markup language: Though not explored in depth at the roundtable, one participant introduced the idea of embedding technology directly into regulatory compliance, or what others have called dynamic or adaptive regulation.[29] The participant noted that when governments open up their data through APIs, they will also be able to develop a "policy markup language" or a set of rules requiring some form of regulatory compliance as a condition for interacting with the data. Developers would then code in automatic compliance as they worked on new applications.

[27] Developed by the International Finance Corporation (IFC) and supported through technical advice from the Monetary Authority of Singapore, AFIN was established initially as a non-profit organization. For more, see "Consultation Document," ASEAN Financial Innovation Network, October 2017, available here: http://afin.tech/index.php/afin-consultation-paper/

[28] Author's correspondence with AFIN.

[28] Lawrence Baxter, a law professor at Duke University, has argued, "Notwithstanding possible cultural resistance by regulators themselves, the development of automated compliance, reporting, and monitoring is perhaps inevitable because it is hard to see how they will otherwise meet the demands of regulating extreme financial complexity. Large amounts of automation might be our only hope for cabining the gigantic and dynamic financial industry within the limits of safety and fair conduct." See "Adaptive Financial Regulation and RegTech: A Concept Article on Realistic Protection for Victims of Bank Failures," *Duke Law Journal*, Vol. 66:567, 2016.

Regional cooperation: Given the borderless nature of cryptocurrencies and the financial products offered by international TechFins, several roundtable participants argued that a national framework was insufficient. As one participant said, regulations remain "country-based, geographically limited, and inward-looking." Digital assets, though, are essentially borderless. Linking this borderless market to a discussion of investor protection, one participant argued that rules denying Thais access to cryptocurrencies or crypto-assets "would end up driving the end-investors out of the country, thus defeating the whole purpose of wanting to protect them." Another participant agreed. "New developments," he said, "merit the question as to whether regulators can continue to act independently in-country on issues related to cryptocurrencies and FinTech in general. When services are being offered by big tech firms that are operating across borders, we need global standards, rather than individual countries each struggling to come up with their own framework."

The lack of a homogenous regulatory environment in ASEAN also holds back the expansion of FinTech products in Southeast Asia, argued several participants.[30] "The border," one participant said, "is one of the most important constraints preventing technology from expressing its full capacity." Another participant asked, "Can ASEAN have an Alipay or a PayPal? I think it's unlikely, because in the bigger economies you'll have six different sets of regulations to comply with and six different strategies." This same person called for ASEAN countries to pursue some form of regulatory passporting so that compliance in one country enables an international firm to operate in others. Even having two ASEAN countries commit to such an approach, he suggested, would unlock a significant amount of FinTech investment in the region.

[30] This is another motivation for the AFIN project described above.

THE NEXT FRONTIER: REGULATING CRYPTOCURRENCIES

Distributed ledger technologies, such as blockchain, enable the issuance of newly created digital currencies, tokens, and financial

and non-financial digital assets.[31] Such cryptocurrencies and digital securities pose significant challenges for regulators, who either have to adapt existing rules to a strange new world or draft new standards for a sector they often do not fully understand. As participants at the Bank of Thailand-Milken Institute roundtable discussed, these issues were a prominent part of the policy debate in Thailand during the drafting and negotiations process of a new piece of legislation called the Digital Asset Business Act, which would later be put into effect as a Royal Decree as described in greater detail in Box D below.[32]

While there was a lack of consensus about their long-term viability, participants generally agreed that the growth and volatility of cryptocurrency markets and the rapid increase in ICOs of new cryptocurrencies should prompt a regulatory response.[33] Since their invention, cryptocurrencies have been used by criminal enterprises to mask transfers for illegal activity, and so governments have an interest in bringing the "dark activity," as one participant called it, into the light. Likewise, regulators want to protect unsophisticated investors from taking unduly risky positions or falling for potential scams.

As roundtable participants discussed the proposed Thai legislation (which, at the time, had not yet gone into effect), they returned to two key regulatory priorities. The first priority for regulators across the ASEAN region, according to one participant, should be to ensure that cryptocurrencies adhere to international AML/CFT and KYC standards. Given the opaque, often anonymous, nature of these markets, however, compliance trading in cryptocurrencies is difficult. As one person pointed out, "Who owns a digital asset, and to whom are they selling? At the end of the day, it's an IP address. We don't know where the IP address originates or who is behind it." The lack of transparency in these markets, he argued, undermined the imperative of resilience the Governor set out in his opening remarks, because without meeting basic AML/CFT standards, the crypto-markets would never legitimately be able to interact with traditional

[31] As an example of non-financial cryptoassets, one participant pointed to the recent initiative by the government of the Republic of Georgia to move their public land title registry onto a blockchain. For more on this development, see "Governments may be big backers of the blockchain," The Economist, June 1, 2017.

[32] The Royal Decree or Emergency Decree is a type of primary legislation in Thailand, enacted in a special circumstance perceived to require urgency. The Council of Ministers (the most authoritative body of the executive branch) may approve an Emergency Decree, which then becomes enforceable without parliamentary approval. The Parliament will then be asked to review such a legislative measure at the next available meeting. If the Parliament votes in favor of the Emergency Decree, it will become a permanent law attaining the same status as an Act of Parliament. Should the Parliament vote against the decree, it will be repealed at that time. The Emergency Decree on Digital Asset Businesses B.E. 2561 was first published in the Royal Gazette on May 13, 2018. Subsequently, the Parliament gave its vote of approval on May 18, 2018.

[33] Globally, the money raised by ICOs increased from less than US$100 million in 2016 to US$3.9 billion in 2017, according to data from CoinSchedule, an ICO listing portal. This exponential increase continued in 2018; by May, the money raised through ICOs stood at US$7.3 billion.

financial institutions for which AML/CFT and KYC compliance are compulsory and indispensable.

A second urgent priority, according to many roundtable participants, would be to set rules to protect investors, particularly unsophisticated investors. Participants discussed this priority as it relates to both the primary and secondary markets for digital assets. The rules around ICOs, one participant argued, should reflect those for any traditional securities issuance. As he explained, "There are certain steps required in getting money from the public." Legitimate issuers will be able to accurately communicate important information to the public about company management, business practices, and the proposed use of funds. For issuers raising funds for illicit activities, though, the disclosure requirements can alert supervisory authorities as well as investors to potentially fraudulent behavior.

Still, given the new technology involved, one participant believed that ICOs represent "a great sandbox candidate." He noted the Monetary Authority of Singapore (MAS) had recently issued an invitation for anyone working on ICOs to apply for the MAS's regulatory sandbox, where they could experiment with business models in a relaxed regulatory environment and work directly with regulators to show how ICOs could meet disclosure standards. At the time of the roundtable, however, no one working on ICOs had taken up the MAS's offer, leaving the impression that these issuers either a) do not want to bring their activity under regulatory scrutiny or b) already know their digital assets cannot pass basic regulatory hurdles.

In the secondary market, a number of participants asserted that selling cryptocurrencies and digital tokens to unsophisticated investors constituted a serious risk. They pointed to the high volatility of the Bitcoin market and to the fact that soaring Bitcoin prices in the previous year had brought a number of new intermediaries of questionable quality to the market.

At the same time, some participants argued, investors had no way of accurately and consistently assessing the value of a digital asset. "Not even banks know how to advise cryptocurrencies," one participant said. "Getting advice from someone who is illiterate is actually bad advice." One participant concluded that the sector needed to "have a regulatory framework that would allow for transactions in the light that people can see and can understand."

Others, though, urged a lighter touch. "My view on ICO regulation," one person said, "is caveat emptor. This is a new, fake currency: buyer beware." Another participant, referencing the Governor's first imperative, argued, "If we take investor protection to be interpreted as insulating everyone from any type of loss, then that's not productive." This participant suggested that over-emphasizing investor protection could be interpreted by consumers as a promise that these markets are risk-free. Even sophisticated investors lose money, he noted, adding, "That's part of participating in markets."

Box D. New Thai FinTech Legislation

The Draft Law on Business Promotion and Public Access to Services through Financial Technology

The Draft FinTech Act is intended to help Thai businesses and FinTech startups utilize financial innovations. The Act is being revised after public hearings and is slated to be submitted to the National Legislative Assembly. The Thai FinTech association supports the bill and believes it will make Thai firms more competitive against foreign FinTech firms. The act aims to:

1. Strengthen confidence in electronic transactions as a normal means of settlement
2. Facilitate access to government information for know-your-customer (KYC) purposes
3. Support electronic identity verification
4. Allow access to anonymous government data in order to develop financial products and services.

According to a 2017 press release, the SEC believes the act will "create opportunities for established and potential business operators to maximize the use of FinTech in developing financial and investment services with less legal limitations and more efficient information access."

Box D. New Thai FinTech Legislation (cont.)

The Royal Decree on the Digital Asset Businesses B.E.2561

The recently enacted Royal Decree on Digital Asset Businesses establishes a new regulatory regime for cryptocurrency platforms as well as those businesses that issue digital tokens. The decree's enforcement provisions include potential fines and prison sentences for fraudulent and unauthorized cryptocurrency transactions and initial coin offerings (ICOs).

Under the new rules, the SEC will be charged with regulating cryptocurrencies, which will now be considered digital assets, as well as other digital tokens and related businesses. Digital asset exchanges and broker-dealers will be required to register with the SEC within 90 days of the decree coming into force. In addition, companies looking to raise funds through ICOs must first obtain approval from the SEC and only offer the digital tokens through the authorized ICO portal. Businesses failing to comply with the Royal Decree will be charged with criminal provisions in which both the offences and the degree of penalties are comparable to the Securities and Exchange Act. Enacted at the same time as the Royal Decree on the Digital Asset Businesses, a revision to Revenue Code 19 establishes a 15 percent tax on digital asset profits on digital asset trades.

The Ministry of Finance supported the decree as necessary to prevent money laundering, tax avoidance, and other crimes. The authorities believe that by appropriately regulating this market, they will be able to increase consumer protection and gain investor confidence for operating businesses in Thailand. A number of FinTech entrepreneurs opposed the measure, however, arguing that by being overly restrictive the decree will discourage investment and useful market innovations.

Prepared by Daniel Murphy, Milken Institute Center for Financial Markets

CONCLUSION

The development of financial technologies and the emergence of new competition in the form of large TechFin firms has introduced novel challenges for traditional banks and regulators. While banks are successfully adopting many new technologies, the participants at the Bank of Thailand-Milken Institute roundtable in Bangkok believed that, in general, banks were unlikely to fully "disrupt themselves" due to ingrained bureaucratic cultures and, in many cases, a lack of technical talent. Participants also doubted whether banks and FinTechs could successfully work together for a number of reasons. Instead, many participants saw platform dominance as the most probable future for the financial industry. Banks, they thought, were likely to either serve as financial utilities for the TechFin firms or to transform themselves into platforms through open banking.

As for the role of government agencies to shape the future of finance, roundtable participants cited the development of the India Stack, the BOT's build-out of Thailand's e-payments infrastructure, and the Monetary Authority of Singapore's API registry as examples of positive government involvement in FinTech development. While they acknowledged that regulating new technologies has led to tensions among policymakers and between regulators and the industries they regulate, participants believed that a future-oriented financial regulatory policy framework was possible. A key component of such a framework, though, would be a better regulatory process itself, one able to keep pace with the rapid development of financial technology.

Taken as a whole, the roundtable pointed toward several overarching recommendations for policymakers in Thailand, as well as those in other ASEAN countries working to oversee the deployment of new technologies and the expansion of non-traditional financial-service providers.

CONCLUSION

The core recommendations that arose from the discussion in Bangkok are the following:

- *Evaluate current processes for regulatory reforms to determine whether they are adequately responsive to the pace of technological change.* Regulators should examine what changes may be needed to accelerate rule-making decisions.

- *Empower regulators to supervise new technologies and entities*. Governments will need to ensure regulators have the human and systems capacity needed to effectively monitor new financial activities and enforce regulatory standards.

- *Create forums and processes that encourage coordination and collaboration among relevant government agencies*. As platforms reduce or eliminate barriers between various financial products and service providers, the regulatory response will require a cooperative approach from central banks, securities regulators, ministries of finance, and other relevant agencies.

- *Engage in ongoing consultation with both private-sector incumbents and new entrants.* Regulators should seek to more fully understand how proposed rules will affect traditional financial institutions, FinTech startups, and expanding TechFins. This engagement certainly includes, but is not limited to, continued FinTech experimentation within regulatory sandboxes.

- *Encourage the establishment of responsible industry standard-setting bodies*. Governments should look for opportunities to encourage the private sector to put forward its own standards for the responsible development and interoperability of FinTech innovations through organizations such as the ASEAN Financial Innovation Network. When possible, regulators should seek to participate in such associations as official observers.

- *Assess the opportunity—and the proper parameters—for the adoption of open-banking solutions for bank-FinTech collaboration*. Open banking may help bring down the barriers for further collaboration between traditional banks and FinTech startups, enabling platform economies of scale with benefits for businesses and consumers. However, this will require a new regulatory approach, and regulators should determine what role they wish to play to catalyze this kind of partnership.

- *Take a strategic approach to the cross-border nature of many financial technologies*. In many cases, the supply of FinTech products, the consumer demand, and the sources of capital investing in FinTech companies are international in nature. Foreign companies and technologies may bring welcome new competition that drives increases in productivity and inclusion. Likewise, harmonizing regulations or enabling regulatory passporting may help create economies of scale among ASEAN countries.

- *Establish standards for how businesses—both in the financial-services industry and in other sectors—collect, store, and share the online data generated by individuals*. As individuals increasingly share details of their financial and private lives online, policymakers should set in place rules for the ethical use of that data.

In conclusion, the application of new technologies within financial services is clearly changing the industry and has given rise to new challengers to traditional institutions as well as new complexities for public policy. While some aspects of the future of finance are coming into focus, the full picture remains uncertain. However, with a sound regulatory environment and engagement among all relevant stakeholders, there is significant potential for the emergence of a financial sector that is more productive, inclusive, and resilient.

LIST OF ACRONYMS

TAFIN	ASEAN Financial Innovation Network
AML/CFT	Anti-Money Laundering and Combating the Financing of Terrorism
API	Application programming interface
ASEAN	Association of Southeast Asian Nations
BOT	Bank of Thailand
DLT	Distributed ledger technology
ICO	Initial coin offering
IoT	Internet of Things
JSDA	Japan Securities Dealers Association
KYC	Know-your-customer
LG	Letter of guarantee
MAS	Monetary Authority of Singapore
SCB	Siam Commercial Bank
SMEs	Small and medium-sized enterprises
SRO	Self-regulating organization
TBA	Thai Bankers' Association

GLOSSARY OF FINTECH TERMS IN THIS REPORT

Aadhaar: A unique 12-digit number linked to an individual's biometric and demographic data, which is issued by the Unique Identification Authority of India (UIDAI)

AML/CFT requirements: Financial transparency requirements, including know-your-customer (KYC) provisions, for financial institutions (broadly defined) aimed at preventing the illegal use of funds

Blockchain: A type of distributed ledger technology, initially developed for cryptocurrency markets, that provides a digital, decentralized, public record of transactions among a network of users, updated regularly through the addition of new "blocks" or batched additions to the database verified by users

Chatbot: Interactive software that can respond in real-time to questions and inputs from consumers in a way that mimics human text messaging

Cryptocurrencies: Digital or virtual currencies, the most famous of which is Bitcoin, that use distributed ledger technology to offer a payments alternative to government-issued currencies

Distributed ledger technology (DLT): The technology that enables the creation of a shared, decentralized database that provides a permanent record of transactions between geographically and institutionally diverse participants connected over the internet, without the need for a central arbiter or authority

eKYC: A paperless process that allows banks to meet know-your-customer requirements in real-time via verified data submitted online

FinTech: The use of technology in the provision of financial products and services

India Stack: The digital architecture built on top of the Aadhaar unique identification system in India in order to reduce the costs and time associated with public and private service delivery and push India further toward a cashless, paperless economy

GLOSSARY OF FINTECH TERMS IN THIS REPORT

Initial coin offering (ICO): A method of raising capital online through the sale of newly invented digital coins or tokens

Internet of Things (IoT): Networks of physical devices, such as electronics, appliances, machines, and vehicles, equipped with sensors that collect and share data over the internet

Machine learning: The use of algorithms to process large amounts of data and apply statistical findings to improve the performance of specific tasks without the intervention of human programmers

Open APIs: Sets of public coding rules for external software developers that ensure various kinds of applications can interface with an institution's own underlying systems and proprietary datasets

Open banking: The use of open APIs to facilitate consumer consent for sharing banking data with third party financial service providers, with the aim of fostering greater competition in the banking sector and, in some cases, enabling banks to more easily incorporate FinTech applications created by third parties into their own processes and product offerings

PromptPay: A payments initiative launched in 2016 in Thailand to enable the transfer of funds using proxy identification methods, such as a state-issued ID or a mobile number, to identify the recipient of the funds

Quick Response (QR) Code: A machine-readable, black-and-white square barcode with various applications, including its use to initiate payments when scanned by a smartphone camera

Regulatory sandbox: A tailored and often relaxed regulatory environment in which select financial firms can test FinTech products for a set period of time under close supervision by regulators

TechFin: A technology firm with a large user base (typically in the tens of millions or larger) that has moved laterally from its core business into financial services

APPENDICES

APPENDIX 1. SELECT MILESTONES FOR THE THAI FINTECH SECTOR

2016

- Thailand created the Ministry of Digital Economy and Society (MDES) to promote digital business.

- The Bank of Thailand introduced regulations to enable electronic know-your-customer (e-KYC) processes. This regulation delineates permissible technology and processes for e-KYC, with the goal of encouraging financial institutions to effectively provide financial services using a variety of innovations under the sound risk management framework.

- The Bank of Thailand launched its regulatory sandbox for banks and other entities under its authority.

- The PromptPay national payments system was launched, with the potential to save Thai banks over US$2 billion over the next ten years according to the Thai Bankers' Association.

2017

- The Bank of Thailand and the Monetary Authority of Singapore (MAS) signed a FinTech Cooperation Agreement and Memorandum of Understanding on Banking Supervision.

- Five of Thailand's largest banks exited the Bank of Thailand's regulatory sandbox with permission to offer standardized QR code payments through the PromptPay system to the general public. Later, three additional banks received the same approval.

- The Thai Securities and Exchange Commission launched its own regulatory sandboxes focused on different aspects of financial services.

· Thailand's Office of Insurance Commission established a regulatory sandbox for InsurTech firms to test their products.

2018

· The Bank of Thailand restricted financial institutions from a variety of activities relating to cryptocurrencies, such as trading in cryptocurrencies and allowing customers to use their credit cards to buy cryptocurrencies.

APPENDIX 2. THE SINGAPORE APPROACH

At the Bank of Thailand-Milken Institute roundtable, Sopnendu Mohanty, the Chief Fintech Officer of the Monetary Authority of Singapore, presented the following 10 priorities as a guide for governments seeking to develop policy frameworks for a digital-services economy. He presented the principles as a technology-plus-policy stack to engender and enable a next-generation financial services industry.

1. *Trusted digital identities*: The foundation for a next-generation digital economy, including a digital financial services industry, is a unique, trusted digital identification for individuals and businesses along the lines of the Aadhaar platform in India.

2. *Trusted digital data hub*: Data from various sources will need to be consolidated and stored on a platform so that they may accessed and analyzed by authorized entities.

3. *Consent*: The third layer of the stack is a consent architecture so that citizens are empowered to consent to how their digital identity and the digital data they create are used.

4. *Public infrastructure for the digital economy*: In the traditional, physical economy, the government plays a facilitating role through financing the construction of roads, ports, hospitals, schools, water management plants, and other public goods.

The digital equivalents of such utilities will be needed in the new economy. Examples may include a common KYC utility or a credit information platform for small and medium-sized enterprises (SMEs).

5. *Data residency policies*: Policymakers will need to set rules about how and where— domestically or internationally—data are created, stored, and shared in a way that respects citizens' privacy.

6. *Data processing and scale computing*: Once the data exist, the question remains as to how they are analyzed. Public policy will need to address the coming advances in quantum computing, edge computing (the interaction and data processing of networked devices at a local level), and cloud computing.

7. *Unbundling processes and open architectures*: The digital economy is based on unbundling processes, optimizing them, and often re-combining them. In the financial services industry, TechFin firms and platforms epitomize this approach. In this environment, regulators will increasingly need to see processes and products in their unbundled form and regulate them accordingly, regardless of what kind of company is offering them. This will likely mean an expansion in the numbered of licensed entities, a development which will almost certainly increase the remit of regulatory authority while also increasing the burden on regulatory resources. It will also likely mean setting rules for the expanded use of open APIs across industries, including in financial services.

8. *The regulatory process*: The speed of technological change is outpacing the capacity of the traditional policymaking processes to keep up. As a result, instead of basing regulations on studies and consultations, regulators will increasingly need to develop rules from the evidence of data analysis and controlled experimentation in regulatory sandboxes.

9. *FinTech talent and literacy*: Policymakers should think now about the skillsets citizens will need to thrive in the digital economy and should put into place practical initiatives to develop those skillsets, both among future FinTech professionals and the consumers who will need to be able to understand the benefits and risks of the products the industry is selling them. At the most basic level, this includes the "financial personal hygiene" of refusing to share passwords and making those passwords difficult to hack.[34]

10. *Cybersecurity*: The final component of a robust policy framework will be the policies and processes that protect the digital economy from disruptive attacks.

[34] The hygiene metaphor is deliberate and refers to the kinds of educational campaigns the government of Singapore undertook as the nation emerged from poverty and became a high-income country. For example, in the late 1960s and early 1970s, the Ministry of Health organized a campaign to distribute toothbrushes to school students and teach them how to use them. For more, see "Teeth brushing exercise, 1969," National Archives of Singapore, June 19, 2015. The article is available here: www.nas.gov.sg/blogs/archivistpick/teeth-brushing/

ABOUT US

ABOUT THE AUTHORS

John Schellhase is an associate director at the Milken Institute Center for Financial Markets, where his work primarily focuses on financial-market development in developing countries.

Staci Warden is the executive director for global markets development at the Milken Institute, where she leads initiatives on strengthening capital markets, access to capital, financial technology, and financial education.

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ABOUT US

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