



**Asia-Pacific  
Economic Cooperation**

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# APEC FinTech Scoping Study

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**APEC Economic Committee**

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## Background

The growth of digital economies, accelerated by COVID-19, has transformed many industry sectors as consumers, businesses, and government agencies adopt digital technologies and applications. Throughout 2020, lockdowns greatly impacted the daily operations of several vertical industries and limited access to different types of goods and services. Moreover, as fear of the pandemic spread, people increasingly relied on digital channels to fulfil their needs. This included FinTech firms and digital solutions for making online payments, ranging from paying for groceries and receiving government grants to borrowing money and paying for cross-border e-commerce.

APEC member economies' efforts to push for cashless transactions have facilitated these changes, and the volume of digital transactions is set to continue rising due to a growing global reliance on digital devices, channels, and platforms for school, work, and entertainment. However, despite the innovation and adoption of new technologies, challenges persist. While the overall economic benefits of promoting and accelerating FinTech developments are clear, the extent to which APEC member economies have enacted policies that enable FinTech firms to flourish remains uncertain. By better understanding the various policies and regulatory frameworks, as well as potential divergences of measures throughout the APEC region, regulators can better identify and facilitate ways to enable innovation and facilitative practices both domestically and internationally.

Given the critical importance of FinTech to economic prosperity, and building on the earlier study **APEC Financial Services: Increasing APEC's FinTech and RegTech Capabilities Post-COVID-19**, this **APEC FinTech Scoping Study** seeks to provide a landscape assessment of (i) the typology and number of FinTech firms in APEC, to demonstrate the rich variety of approaches and provide on-ground evidence of FinTech development in member economies; (ii) the foundational regulatory frameworks and enabling policies for FinTech growth and innovation; and (iii) current FinTech activity in APEC member economies, exploring links between the strength of the member economy's policy environment, the level of FinTech activity, and its progress towards achieving socioeconomic development outcomes, such as in e-commerce, health, and education. These findings will support APEC member economies to (i) implement and align foundational policy and regulatory frameworks; and (ii) engender closer cooperation to encourage, promote, and grow the use of FinTech across the APEC region.

This report is structured as follows:

- **Section 1: Understanding APEC's FinTech Landscape** presents an in-depth assessment of the variety of FinTech innovations, which are classified into four major segments: Payments, Digital Banking and Alternative Finance, WealthTech, and Other Innovations. Insights on major hubs identified for each segment, as well as emerging trends, are presented. This section also presents a qualitative overview of the stakeholders involved, including regulators, industry players, and international organisations, as well as the respective roles they play in facilitating FinTech growth and innovation.
- **Section 2: FinTech Policies and Regulations in APEC** examines key policy and regulatory issues for APEC-level discussions and presents a qualitative review of (i) enabling policies that are encouraging FinTech growth and innovation; and (ii) foundational regulatory frameworks that support the wider progress of digital transactions. The scoping study is focused on policies and regulations in the first instance as they form the fundamental building blocks of any framework to drive growth.

- **Section 3: Sizing APEC's FinTech Opportunity** assesses the current state of FinTech activity and estimates the size of FinTech opportunity for APEC economies, exploring any links between the strength of the given economy's policy and regulatory environment, the amount of FinTech activity, and its progress towards achieving socio-economic development outcomes. The section examines possible statistical relations between the policy environments of APEC economies, the proportion of digital transactions, and economic growth through regression analysis.
- **Section 4: Conclusions and Recommendations** draws together key insights from the previous sections and provides recommendations for APEC member economies to consider as the next steps in encouraging greater coordination and cooperation for FinTech growth and innovation.
- **Appendix I** sets out the FinTech profile of each APEC member economy, including top FinTech segments in-market, major industry stakeholders, major enabling and foundational major industry stakeholders, key enabling policies and regulation and foundational frameworks, the share of digital transactions as a percentage of all transactions within the economy, and other key figures.
- **Appendix II** sets out the economic impact methodology, which includes sizing the volume and average value of digital transactions in APEC, sizing the volume of digital trade in APEC, and the regression analysis for the policy index and key economic indicators.

# Executive Summary

## Key Takeaways

**There is varying maturity in the level of FinTech development across APEC, with certain economies home to a large number and variety of FinTech firms while others have a higher concentration of specific segments.** Major FinTech hubs such as the US and China dominate the landscape in terms of the number of firms headquartered and operating in-market, likely owing to their large economic stature. Other economies, such as Australia; Canada; Hong Kong, China; and Singapore have sizable FinTech markets relative to their economic size.

**Payments is a priority FinTech segment for almost all APEC economies both in terms of volume and share of the domestic market.** This reflects the importance of payments both to the digital economy and as a key element of financial inclusion efforts. Payment firms headquartered in APEC account for almost half (43.4%) of all FinTech firms headquartered in APEC. Services that are gaining attention in this segment include digital wallets, buy-now-pay-later services, and cross-border payments.

**Major hubs for digital banking and alternative finance include the US and China, with both economies home to industry pioneers and regulatory innovation in the segment.** The development of digital banks and alternative finance is also prominent in smaller FinTech markets like Mexico and Peru, driven in part by low banking penetration and underutilisation of formal financial services. An emerging trend that is gaining increasing regulatory attention is the growing presence of large technology companies, or 'Big Tech' firms, offering services in digital lending.

**Major hubs for WealthTech, which includes services like robo-advisory and robo-investing, are primarily developed economies like Australia; China; Hong Kong, China; and the US,** where the financial market and regulations governing such activities are relatively well developed. The exception to this is Thailand, a developing economy with a vibrant WealthTech segment that accounts for 30.91% of its local FinTech market in terms of firms headquartered in-economy. Advancements in technology are allowing for increasingly personalised advisory services, while the emergence of new investor segments is driving interest in new asset classes like digital currencies and sustainability-focused investment products.

**APEC economies with a vibrant market for other FinTech innovations beyond payments, digital banks and alternative finance, and WealthTech, include China; Canada; Chile; Chinese Taipei; and the US.** Areas that have seen notable research and development (R&D) and capital investment are digital technologies and services for regulatory compliance, supervisory analytics, financial administrative processes, blockchain, artificial intelligence, and cybersecurity.

**Each of the five major ecosystem stakeholders identified has its own unique role and influence in the development of a vibrant FinTech landscape.** The five major stakeholders are central banks and financial regulators; FinTech start-ups and non-traditional financial sector players like technology and telecommunication companies; banks and financial institutions; retail consumers; and regional and international organisations.

**Across APEC, economies have introduced a range of policies and regulations that are enabling and foundational to FinTech growth and innovation.** Enabling policies and regulations, such as those that encourage interoperability between domestic payment systems or govern a specific FinTech

activity, apply to specific portions of the domestic FinTech ecosystem and can encourage greater innovation and efficiency. On the other hand, foundational policies and regulations, such as data privacy regulations, cybersecurity frameworks, consumer protection, etc., apply to sectors beyond just finance but provide the necessary building blocks for FinTech products and services, such as cross-border payments that are essential for digital trade. The mix of enabling and foundational frameworks that economies have introduced suggests that there is no one-size-fits-all solution to creating a policy environment that supports FinTech growth and innovation. Instead, the varying approaches economies choose to take are likely due to domestic contexts.

**In sizing APEC’s FinTech opportunity, economies with stronger foundational policies and regulations were observed to have a higher number of digital transactions,** even after controlling for the size of the labour force and level of development (GDP per capita). This observation reinforces the hypothesis that strong foundational policies and regulations (data protection, cybersecurity frameworks, consumer protection, competitive business environments, etc.) are important for unleashing the benefits of FinTech and supporting digital economy growth.

**That said, a strong enabling policy environment for FinTech was found to be correlated with higher GDP per capita,** wherein a one-point increase in the enabling policy environment for the FinTech pillar of our policy index corresponded with a USD371 increase in GDP per capita two years later. This suggests that a stronger focus on policies and regulations that directly enable FinTech can have a positive impact beyond the financial services sector, benefitting the entire economy.

**Our findings suggest that both enabling and foundational policies and regulations are necessary to unlock the full economic potential of FinTech.** This strengthens the case for governments to focus on building policy environments that are conducive for FinTech to thrive, creating economy-wide gains.

## Recommendations

APEC provides a strong coordination mechanism for its constituent members to share good practice policies on FinTech, generating diffuse economic benefits such as greater consumer choice and protection, financial inclusion, and more vibrant digital economies. It is critical that individual APEC markets encourage greater harmonisation between their FinTech policy regimes to unlock these benefits at scale.

In addition, as policies and regulations form the foundation of FinTech growth across APEC economies, coordinated and harmonised policy regimes will set the region up for accelerated progress by facilitating institutional collaboration and supporting infrastructure development, innovation, and demand.

APEC and its member economies can consider undertaking a range of short-term and longer-term actions in this regard.

Key short-term actions include:

- **Establish a high-level FinTech coordination process:** To ascribe FinTech innovation with a requisite level of priority on APEC’s broader policy agenda, a high-level FinTech coordination group or process could be established. The purpose of this group would be to agree on key policy objectives in the FinTech space for APEC and member economies and provide guidance and resources to working-level groups on FinTech policies. This group could initially be formed as

part of the APEC Economic Committee or Finance Ministers' Process but would require cross-functional teams from across governments to ensure success.

- **Create good practice policy guidelines:** Several APEC economies have world-class FinTech policy regimes, both in terms of foundational and enabling frameworks. APEC could develop a detailed compendium of good practices in each of these areas for policymakers to reference, thereby encouraging greater harmonisation in anticipation of more formal agreements or policy initiatives. Key good practice areas include e-KYC frameworks, cross-border payments, and data localisation thresholds.
- **Develop cross-border FinTech pilot initiatives:** To demonstrate the benefits of coordination at the APEC level in FinTech, all or a subset of member economies could develop a pilot regulatory initiative in an emerging area of innovation. There are many viable areas for a pilot programme, including the implementation of Cross-Border Privacy Rules (CBPR) to facilitate greater data sharing specifically in the finance sector, creating a set of regional guidelines for the use of AI in finance, or creating a cross-border regulatory sandbox to encourage innovation in RegTech.

Key long-term actions include:

- **Develop a comprehensive FinTech cooperation framework:** APEC member economies could develop a comprehensive framework to enable cooperation in the FinTech space, setting out key economic targets and policies to grow their FinTech sectors. An initial three-year roadmap could be developed, with targets then geared for five-year intervals. Key strategies as part of this plan could be (1) encourage FinTech innovation; (2) examine domestic regulations with a view to harmonisation; (3) examine cross-border interoperability; and (4) align with broader economic agendas.
- **Create capacity-building programmes to facilitate cross-border digital trade:** There are key disparities between data privacy and cross-border data sharing regimes across different APEC economies. A capacity-building programme for APEC economies could be beneficial to address these concerns and provide the knowledge and technical training necessary to implement good practice policies.
- **Examine common data collection and reporting standards for FinTech sectors:** A key challenge in the development of this report was the lack of (i) uniform data availability on the FinTech landscape, as well as (ii) a more robust common data source to compare FinTech policies in APEC member economies. This creates barriers to measuring progress efficiently and effectively in the long term. To address this concern, APEC members could coordinate to examine common data collection and reporting standards for their FinTech sectors, which cover various aspects of the data presented in this report. This data could be published through a public portal or a FinTech 'index' to facilitate progress comparisons and better external research.
- **Establish an APEC FinTech Innovation Hub:** Disparities in the size of FinTech start-up ecosystems across APEC members are expected due to the differences in their respective economic sizes, but start-ups in certain economies could be further disadvantaged if their local ecosystems are less developed because of a lack of available capital and knowledge sharing between firms. An APEC-level start-up accelerator programme could be extremely beneficial in this regard, providing firms from all members with access to the capital and knowledge they need to develop innovative products and services. Accelerators could be hosted in more developed member economies, such as the US, and investors could draw from the public sector, private sector, institutional investors, and impact investors.



# 1. Understanding APEC's FinTech Landscape

To develop a comprehensive understanding of APEC's FinTech landscape, it is important to understand the variety of FinTech innovations occurring in each market, as well as to get a sense of the major stakeholders, given the variety of roles that they can play. This section covers both aspects in detail:

- Section 2.1 provides an in-depth assessment of FinTech innovation across four major segments, with insights for major markets in each of these segments; and
- Section 2.2. provides an overview of the stakeholders involved, including regulators, industry players, and international organisations.

## 1.1 FinTech Innovation in APEC

Innovation in FinTech is booming across APEC, with both established players and emerging start-ups developing new products and services. In this report, we have viewed **FinTech as any technologically enabled innovation in the financial service sector that could result in new business models, applications, processes, or products with an associated material effect on the provision of financial services.**<sup>1</sup>

Innovation in FinTech is vast and diverse, but for the purpose of this report, we have classified it into four broad segments. These segments have been derived based on similar classifications by international organisations such as the Bank for International Settlements (BIS) and data aggregators such as PitchBook, as well as an analysis of the major segments emerging in APEC economies:

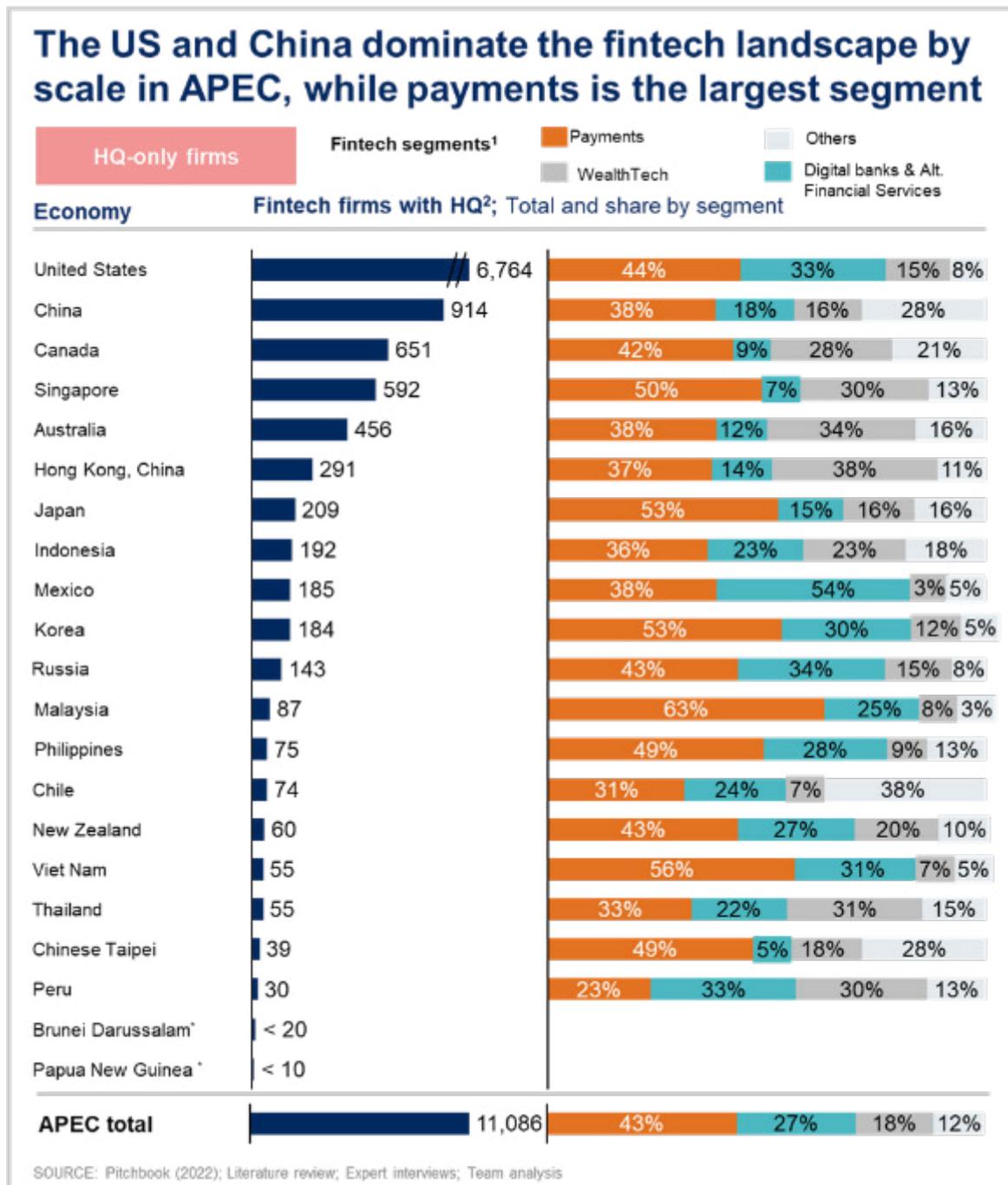
- **Payment services**, including payment processing services and online payment platforms;
- **Digital banking and alternative finance**, including digital banks and alternative financial services like digital lending and online crowdfunding platforms;
- **WealthTech**, including robo-advisors, trading platforms, and investment management tools for new digital assets; and
- **Other innovations**, including applications that do not fall into the aforementioned segments, such as InsurTech, RegTech, financial administrative tools, etc.

The prevalence of these innovations varies significantly across APEC, with certain markets home to a large number and variety of FinTech firms, while others have a higher concentration of specific segments. A summary of the FinTech firms headquartered in each market and the share by segment is presented in Figure 1 below, while a similar summary of all firms operating in each market, regardless of headquarters location,<sup>2</sup> is available in Figure 2 overleaf.

<sup>1</sup> Financial Stability Board, Bank for International Settlements (2017) FinTech credit, market structure, business models, and financial stability implications, [https://www.bis.org/publ/cgfs\\_fsb1.pdf](https://www.bis.org/publ/cgfs_fsb1.pdf)

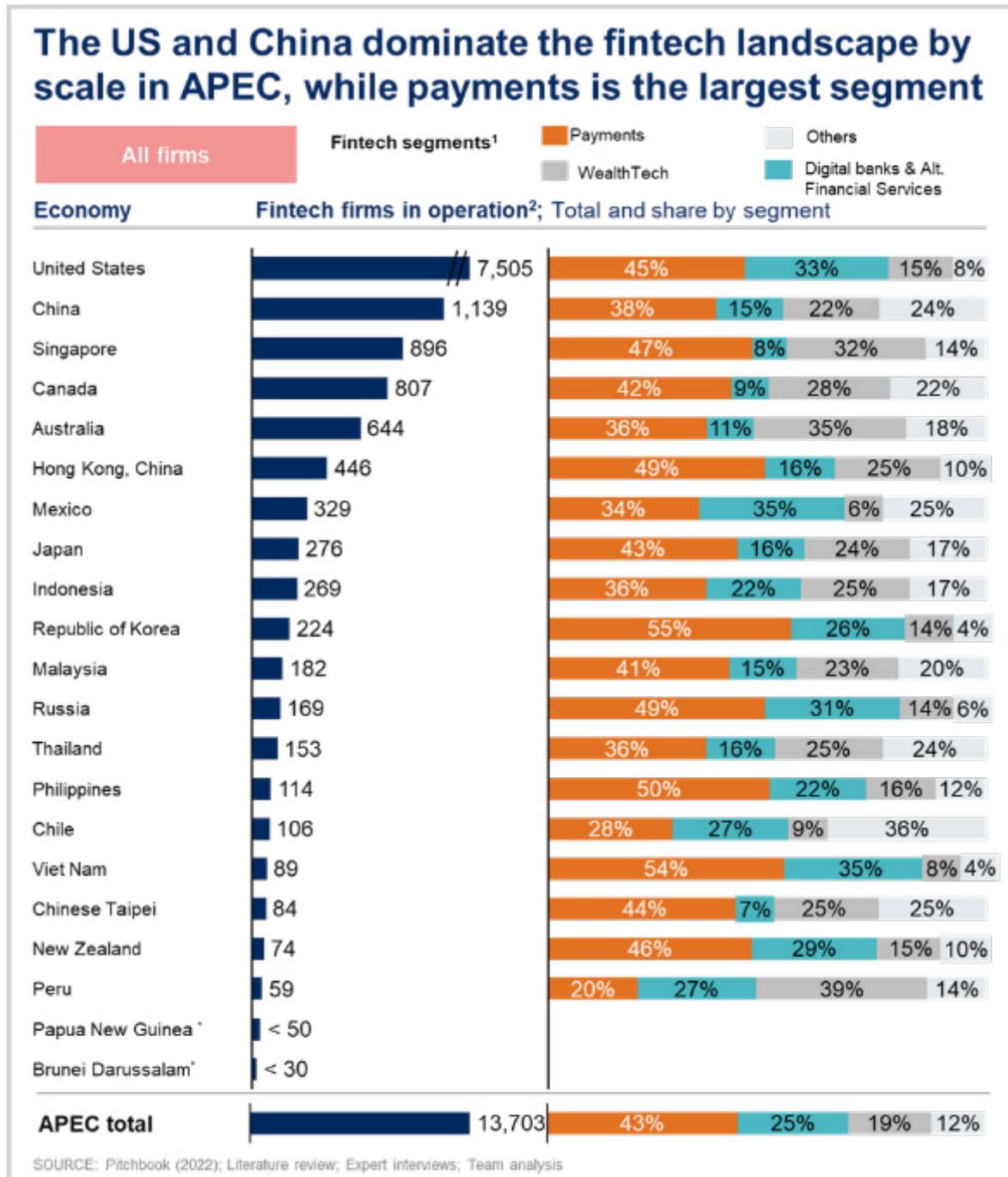
<sup>2</sup> This includes FinTech firms headquartered in an APEC economy with operations in another APEC economy, as well as FinTech firms operating in an APEC economy with headquarters outside of APEC.

Figure 1: Summary Analysis of FinTech firms headquartered in APEC



- The payment segment includes payment processing services and online payment platforms; Digital banking and alternative financial services like digital lending and crowdfunding platforms; the WealthTech segment includes robo-advisors, trading platforms, and investment management tools; Others includes all other products and services that do not fall into the above segments, including applications such as InsurTech, financial administrative tools, etc.
  - Firms that are currently in business captured in the Pitchbook database as of June 2022 headquartered in-economy.
- \* Breakdown not available in the Pitchbook database; the number of firms has been estimated through external desktop research.

Figure 2: Summary Analysis of all FinTech firms operating in APEC



1. The Payments segment includes payment processing services and online payment platforms; Digital banking and alternative financial services like digital lending and crowdfunding platforms; the WealthTech segment includes robo-advisors, trading platforms, and investment management tools; Others includes all other products and services that do not fall into the above segments, including applications such as InsurTech, financial administrative tools, etc.
  2. Firms that are currently in business captured in the Pitchbook database as of June 2022 operating in-economy, regardless of headquarters.
- \* Breakdown not available in Pitchbook database; number of firms has been estimated through external desktop research.

The analyses demonstrate that the United States (US) and the People's Republic of China (China) dominate the FinTech landscape in terms of the number of FinTech firms headquartered and operating in-economy, reflecting their status as global 'hubs' for FinTech.

At the aggregate level, it appears that there are significant differences in the total number of firms operating in a particular economy versus only those headquartered; i.e., over 25 percent more in all economies except for the US; China; Canada; Republic of Korea (Korea); New Zealand; and Russia. These differences are even greater in smaller economies such as Chinese Taipei; Mexico; Malaysia; and Thailand.

Furthermore, it is interesting that there are not many economies with significant differences in the percentage share of segments when comparing firms headquartered versus all firms operating in-market. This suggests that in segments where domestic firms are particularly concentrated, foreign firms have also been able to enter the local market. It could also mean that certain segments (for example, payments) are simply more important or attractive to the global FinTech market at this point in time.

When we look at specific segments, at the aggregate level, the payments segment is the largest in terms of the number of firms, underscoring its maturity relative to the others. This segment also constitutes the largest share of the domestic FinTech market for almost all APEC economies, except for Chile; Hong Kong, China; Mexico; and Peru.

Such insights are further explored in the following sub-sections, with each sub-section consisting of:

- An overview of the characteristics of the segment, including major products and services;
- A summary of the top three trends observed across APEC in terms of emerging innovations;
- An assessment of the major ‘hubs’ in each segment, with ‘hubs’ defined as economies with the highest concentration of FinTech firms (i.e., total number of firms) headquartered in-market for a particular segment across APEC; and
- An assessment of the segment’s relevance and importance to individual economies, covering economies whereby the segment accounts for a large share of the domestic FinTech market both at a headquarters level and for all firms operating at the in-market level.

### 1.1.1 Payments

Digital payment services improve the ease of conducting transactions online, reducing the costs and risks of handling physical cash and improving the transparency of monetary transactions. Demand for digital payments has grown significantly over the past decade and is only expected to keep rising, fostered by improved broadband and mobile data access, the introduction of new technologies to accept and pay for transactions, improvements to the digital infrastructure that underpins payment service systems, a reduction in costs due to economies of scale offered by FinTech, and innovations in regulation. The significant curtailment of in-person transactions during the COVID-19 pandemic further spurred the uptake of non-cash payments, and this behavioural change appears to be permanent. Globally, cashless payment volumes are set to increase by more than 80% from 2020 to 2025, almost tripling from current volumes by 2030.<sup>3</sup>

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<sup>3</sup> PWC (n/a) Payments 2025 & beyond, <https://www.pwc.com/gx/en/industries/financial-services/publications/financial-services-in-2025/payments-in-2025.html#macro5>

The digital payments segment has seen a variety of innovations that can be classified into two broad sub-segments:

- **Payment processing services:** Refers to firms and technologies that assist in the completion of card or digital wallet transactions. This includes firms that provide payment gateway services, online remittance services, buy-now-pay-later (BNPL) solutions, cross-border payments, real-time transactions, and payment platforms between business-to-business (B2B), peer-to-peer (P2P), business-to-business-to-consumer (B2B2C), and others.
- **Online payment platforms:** Refers to firms and technologies that assist in providing a platform that enables storage, use, and interface for the transfer of cash and assets online. This includes firms providing mobile wallet and digital wallet services, cryptocurrency providers, and other digital asset service providers, among others.

Additionally, a growing number of payment firms combine two or more of the activities described above, such as mobile wallets that allow for P2P money transfers. In APEC economies, the payments landscape is particularly vibrant and forms the largest segment of the FinTech sector. Overall, there are more than 4,800 payment firms headquartered across APEC, or 43.4% of the APEC total.<sup>4</sup> This includes over 2,400 firms in the online payment platform space and almost 2,400 firms in payment processing services, or 22.0% and 21.4% of total firms headquartered in APEC, respectively.

Recent innovations in the payments segment have focused on three different business models: digital wallets, BNPL, and cross-border payments. See Box 1 below for further details.

### Box 1: Emerging Trends in Digital Payments



**Growing use of digital wallets:** Digital wallets allow users to store payment methods (e.g., cards, cryptocurrencies, digital assets, etc.) and enable online payment for an endless list of goods and services. They are also increasingly being used for a variety of online financial activities and transactions, such as savings and investment, and, in some cases, access points for gaming and loyalty programs. Globally, the use of digital wallet-based transactions is expected to account for more than half of all e-commerce payment transactions by 2024 as consumers increasingly shift from physical card-based payments to account-based or QR-code-based transactions. For some emerging markets in Southeast Asia, the uptake of digital wallets has already outpaced the adoption of credit cards, in part driven by the convenience of digital wallets as the first point of contact for mobile payments.<sup>5</sup>



**Buy-Now-Pay-Later (BNPL) services.** BNPL or 'data-led lending'<sup>6</sup> is another emerging payment method. Providers of BNPL services essentially take on the task of underwriting customers, managing instalments, and collecting payments, sometimes with zero interest or additional charges. For businesses, BNPL services can lead to higher customer conversion rates, higher

<sup>4</sup> Access Partnership team analysis of PitchBook data

<sup>5</sup> PWC (n/a) Payments 2025 & beyond, <https://www.pwc.com/gx/en/industries/financial-services/publications/financial-services-in-2025/payments-in-2025.html#macro5>

McKinsey (2022) Mobile wallets: Southeast Asia's new digital life hack, <https://www.mckinsey.com/industries/financial-services/our-insights/mobile-wallets-southeast-asias-new-digital-life-hack>

<sup>6</sup> UOB (2021) FinTech in ASEAN 2021: Digital takes flight, <https://www.uobgroup.com/techecosystem/news-insights-FinTech-in-asean-2021.html>

average order values, and a wider customer reach.<sup>7</sup> APEC economies that have seen a considerable uptake in this service include Australia; New Zealand; and the US.<sup>8</sup>



The **rise in cross-border payments** is driven by several factors. Globally, growth in cross-border trade, widespread adoption of digital payment innovations like digital wallets, as well as persistent consumer demand for faster, simpler, transparent, and more convenient ways to move money across borders have further spurred the rise of new entrants to challenge incumbent providers in the payments space. Advancements in digital technologies that enable faster and more secured transfers, as well as access to domestic clearing and settlement systems previously accessible only by traditional banks and financial institutions, have also contributed to a growing variety of cross-border digital payments/remittance service providers. The rise of new asset classes that operate on decentralised finance (DeFi) networks, such as cryptocurrencies and digital assets, further adds to the complexity and vibrancy of the cross-border payments sector. Additionally, central banks of several APEC economies are jumping on this trend and exploring new methods, such as central bank digital currencies (CBDCs), to facilitate cross-border inter-bank settlements, among other use cases.<sup>9</sup>

### APEC Hubs for Payments

When we consider economies with the highest concentration of payment firms headquartered in-market, the **US; China; and Singapore** appear as major payment hubs in APEC, hosting some of the largest payment firms in the world and acting as pioneer markets for emerging payment trends. Further detail on the number of payment firms headquartered in each economy, as well as notable examples of established and/or emerging players in the segment, is provided below.

- The **US** has 2,970 payment firms headquartered in-market, or 61.8% of the APEC total. The size and scale of the payments market in the US are unsurprising given it is home to some of the largest payment firms in the world, such as Visa, Mastercard, PayPal, Stripe, and Fiserv. These companies maintain global operations and have spearheaded many of the innovations used in payments today. The economy is also home to a vibrant payments start-up scene, with companies like MobileCoin providing P2P tokenised payments to facilitate instant and secured transactions; Qwil, a company that advances earned salary ahead of an employee's pay cycle without disrupting the employer's cash flow; and BrainTree, a global payments partner that integrates payment processing companies with popular digital wallets to offer users a seamless payments experience, among many others.<sup>10</sup>
- **China** has 350 payment firms headquartered in-market, or 7.3% of the APEC total. China's payments market includes well-known mobile payment platforms, such as Ant Group's Alipay and Tencent's WeChat Pay and QQPAY, which dominate China's trillion-dollar mobile commerce market. Alipay and WeChat Pay pioneered the use of digital wallets in China, creating ecosystems that allowed third parties to offer an endless variety of online goods and services that consumers can purchase by linking their cards and accounts to the digital

<sup>7</sup> Stripe (n/a) An introduction to buy now, pay later payment methods, <https://stripe.com/en-gb-sg/guides/buy-now-pay-later#introduction>

<sup>8</sup> JP Morgan (2021) Global e-commerce trends report, <https://www.jpmorgan.com/solutions/treasury-payments/global-ecommerce-trends-report#:text=In%202021%2C%20only%2020%20percent,continue%20to%20grow%20in%20popularity>.

<sup>9</sup> BIS (n/a) Project Dunbar: International settlements using multi-CBDCs, <https://www.bis.org/about/bisih/topics/cbdc/dunbar.htm>

<sup>10</sup> MobileCoin, <https://mobilecoin.com/>; Qwil, <https://www.qwil.com/>; BrainTree, <https://www.braintreepayments.com/>

wallet.<sup>11</sup> Their huge market presence also helped popularise innovations like QR-code payments, which facilitate easier checkouts and improve the consumer experience. Other notable players in the payments space include FenBeiTong, which provides a corporate mobile wallet app that helps track business expenses and recently reached unicorn status with its latest funding round in February 2022, and Happay, a BNPL mobile application that allows users to delay payments without additional charges or interests, among others.<sup>12</sup>

- **Singapore** has 294 payment firms headquartered in-market, or 6.1% of the APEC total. Notable payment firms headquartered in Singapore include Coda Payments, a developer of cross-border payments and distribution platforms, 2C2P, a provider of online payment processing services intended to help companies accept payments from banked and unbanked transactions, and Xfers, a payment processing platform that offers credit card processing and Internet banking transfers. Popular emerging players, among others, include Atome, a BNPL platform; Finmo, a B2B2C payment platform; and YouTrip, a multi-currency mobile wallet with zero-transaction fees catering specifically to digital-savvy travellers.<sup>13</sup>

### *Payments as the Largest Domestic Segment*

A different set of economies emerge when we consider payment firms as a share of the domestic FinTech market. Across APEC, **Malaysia; Viet Nam;** and **Korea** have some of the highest percentages of payment firms headquartered in-market as a share of their domestic FinTech market, as detailed below.

- **Malaysia** has one of the highest percentages of payment firms headquartered in-market as a share of its domestic FinTech market across APEC. Payment firms make up 63.22% of local FinTech firms, indicating the vibrancy and importance of the segment to Malaysia's digital economy and trade. The segment includes several well-known firms, such as Touch'nGo, iPay88 Malaysia, and GHL Systems Bid, which provide payment gateway services. Malaysia is also home to emerging start-ups involved in BNPL solutions and online remittance services, such as RiiPay and EasyPay Transfers, respectively.<sup>14</sup>
- **Viet Nam** is another prominent example, with payment firms accounting for 56.36% of the total FinTech firms headquartered within its economy. Notable firms include VNPay, one of the largest payment firms in Viet Nam that offers a variety of payment options and services, including digital wallets, QR code payments, bill payments, ticket booking, and mobile banking. Another prominent player is MoMo, Viet Nam's most popular e-wallet app, which reached unicorn status in its latest round of funding in December 2021.<sup>15</sup>
- Payment firms in **Korea** make up more than half (53.26%) of the total number of FinTech firms headquartered in the economy. Prominent domestic players include mobile wallet providers like NaverPay, KakaoPay, and Toss, which collectively account for almost 90% of

<sup>11</sup> JP Morgan (2019) E-commerce payments trend: China, <https://www.jpmorgan.com/merchant-services/insights/reports/china>

<sup>12</sup> FenBeiTong, <https://www.fenbeitong.com/>; Happay, <https://www.happay.com/>

<sup>13</sup> Coda Payments, <https://www.codapayments.com/>; 2C2P, <https://2c2p.com/>; Atome, <https://www.atome.sg/>; Xfers, <https://www.xfers.com/sg/>; Finmo, <https://finmo.net/>; YouTrip, <https://www.you.co.sg/>

<sup>14</sup> Touch'nGO, <https://www.touchngo.com.my/>; iPay 88, <https://www.ipay88.com/>; GHL, <https://www.ghl.com/>; RiiPay, <https://riipay.my/>; EasyPay Transfers, <https://www.easypaytransfers.com/>

<sup>15</sup> Nikkei Asia (2021) Viet Nam e-wallet MoMo gains unicorn status with \$200m investment, <https://asia.nikkei.com/Business/Technology/Viet-Nam-e-wallet-MoMo-gains-unicorn-status-with-200m-investment>

users in the mobile payments market.<sup>16</sup> All three firms offer a range of services in addition to their popular mobile wallets. For example, KakaoPay and Toss have both ventured into the digital banking sector, while Naver Pay is part of the Internet conglomerate Naver Corporation, which has a popular web platform and domestic search engine. There is also a growing number of FinTech companies that use blockchain technology to provide payment solutions in Korea. For instance, Chai is an app-based payments platform that uses an Application Programming Interface (API) and blockchain technology to enable companies to integrate with a range of payment options for a better consumer experience.<sup>17</sup>

A slightly different picture emerges when we account for all firms operating in-market, regardless of headquarters location. While Korea's and Viet Nam's FinTech sectors still see a heavy focus on payments, we also see the Philippines emerge as a vibrant domestic market, with 50.44% of FinTech firms operating in-market involved in the payments space. This suggests there is a large number of foreign payment firms operating in the Philippines, with many of these foreign firms domiciled in economies like Australia; China; Germany; New Zealand; Sweden; Singapore; and the US, among others.<sup>18</sup> An example of a foreign payments firm operating in the Philippines is Remitly, a popular remittance company based in the US.

Additionally, as noted above, the payment segment constitutes the largest share of the local FinTech market for almost all APEC economies, with the exception of Chile; Hong Kong, China; Mexico; and Peru. For these four economies, FinTech firms involved in the other three segments accounted for the largest share of their respective FinTech market, as discussed in further detail below.

### 1.1.2 Digital Banking and Alternative Finance

Across APEC, the banking and financial service market (deposit-taking, credit, loans, and fundraising) has undergone a significant digital transformation in the past decade. While established institutions such as banks, credit unions, and other traditional lenders remain important sources of funding for businesses and households, many are also turning to alternative digital solutions to meet their needs. For some APEC economies, particularly those with emerging markets, the rise of alternative financing options can help accelerate financial inclusion efforts and boost SME financing rates.

Alternative finance service providers typically leverage new technology to automate and upgrade legacy systems, rely on data-driven analysis to make faster, more accurate decisions, and are not required to operate physical branch networks that can be costly to maintain. Such provisions can lead to lower costs for the service provider and improve the latter's ability to reach a wider customer base, in turn allowing for lower prices and more affordable options for consumers. As these services are delivered online, consumers can access them anytime and are no longer bound by a physical location when choosing the financial service provider that best suits their needs. Moreover, the entry of new players can help boost the overall competitiveness of the sector. Some alternative financial services also rely on non-traditional data sources to measure the creditworthiness of potential clients. This can be particularly important for individuals or SMEs that

<sup>16</sup> Fortumo (2021) Mobile wallets spotlight: South Korea, <https://fortumo.com/blog/mobile-wallets-spotlight-south-korea/>

<sup>17</sup> Chai, <https://chai.finance/>

<sup>18</sup> Access Partnership team analysis of PitchBook data

lack formal credit histories and would have been unable to obtain financing based on traditional credit assessment methods.<sup>19</sup>

In APEC, firms involved in digital banking and alternative finance constitute the second largest segment after payments with almost 3,000 firms, or 27.1% of the APEC total.<sup>20</sup> This includes traditional financial institutions that have adopted digital technologies to improve the provision of their services, as well as a wide variety of alternative financial services firms, ranging from digital-only banks and invoice trading platforms to P2P lending platforms and crowdfunding marketplaces.<sup>21</sup> Emerging trends in this segment are AI-driven digital lending decision-making, digital banks, and open banking frameworks, as detailed in Box 2 below.

### Box 2: Emerging Trends in Digital Banking and Alternative Finance



**Rise of AI in digital lending services:** Digital lending platforms such as P2P lending or crowdfunding platforms facilitate the provision of credit without bank intermediation by matching borrowers to lenders directly. Some platforms do so by allowing lenders to pick and match with borrowers, while others form loan packages or go through online auctions. In recent years, a growing number of digital lending platforms are leveraging AI technology and alternative data sources to develop more holistic borrower risk profiles and help lenders make better-informed decisions, resulting in faster loan disbursement for the borrower and lower default risks for the lender.<sup>22</sup>



**Spread of digital banks:** Digital banks provide traditional banking services via digital means. Some digital banks start with a single banking activity, usually payments, before expanding into other lines like deposit-taking and credit services to capture cross-subsidisation opportunities as their user base grows. Increased adoption of digital financial services and initiatives by governments to accelerate financial inclusion efforts have contributed to the rise of digital banking, particularly in economies with highly underbanked and unbanked populations. The introduction of regulatory initiatives such as special digital bank licences, electronic-know-your-customer (e-KYC) frameworks, and the opening of banking rails to non-traditional financial service providers have also helped boost adoption and innovation in this field.



**Growing acceptance of open banking:** Open banking or open financial data allows third-party developers to use open APIs to build value-add applications around a financial institution. These applications give consumers greater flexibility and visibility over how they manage their accounts and contribute to a more complex and competitive banking ecosystem. The extent to which open banking is adopted in a market can be closely linked to the local regulatory approach. In markets where the central bank or financial regulator has allowed third-party access to select non-public customer data, open banking providers may find it easier to develop better, more unique offerings. For example, SGFindex is a first-of-its-kind public-private open banking initiative launched in Singapore that uses the National Digital Identity (NDI) to retrieve personal financial information aggregated from participating banks and government agencies. In comparison, despite the introduction of a FinTech Law in 2018 that paved the way for open banking services, adoption in Mexico has been slow as access given to non-bank financial institutions is only to non-

<sup>19</sup> BIS (2020) Regulating FinTech financing: digital banks and FinTech platforms, <https://www.bis.org/fsi/publ/insights27.pdf>

<sup>20</sup> Access Partnership team analysis of Pitchbook Data.

<sup>21</sup> For the purpose of this report, examples provided in this section focused on FinTech start-ups or FinTech firms and not traditional financial institutions like banks that have adopted digital technologies to enhance their service and product offerings.

<sup>22</sup> OECD (2020) digital disruption in banking and its impact on competition, <https://www.oecd.org/competition/digital-disruption-in-banking-and-its-impact-on-competition-2020.pdf>

Forbes (2022) Six alternative lending trends to watch in 2022 and beyond, <https://www.forbes.com/sites/forbesfinancecouncil/2022/01/19/six-alternative-lending-trends-to-watch-in-2022-and-beyond/?sh=6b0a500c70d4>

confidential personal financial data, such as ATM locations or information about a bank's service offerings.<sup>23</sup>

### *APEC Hubs for Digital Banking and Alternative Finance*

APEC economies with a high concentration of digital banks and firms offering alternative financial services headquartered in-market include the **US**; **China**; and **Mexico**. Further details on the number of FinTech firms in this segment that are domiciled in each economy, as well as notable examples of established and/or emerging players in the segment, are provided below.

- The US** has 2,247 firms headquartered in-market in this segment, or 75% of the APEC total.<sup>24</sup> This includes established players like LendingClub, a pioneer in the FinTech-enabled P2P lending industry; Upstart, a P2P lending provider using AI to drive lending solutions built on the cloud; and SoFi, the consumer finance and digital bank provider, among others. Emerging players in this space further demonstrate the creativity and diversity of digital banking and alternative financial services. For example, Column is the first 'national-chartered bank' established with the intention of growing its user base through open banking applications; QuantamRe is a crowdfunding platform for property using blockchain technology; and HedgeLab is the developer of a capital-efficient protocol that provides liquidity for cryptocurrency assets and offers its users interest-free loans.<sup>25</sup> There are also a number of large technology companies or 'Big Tech' players that are emerging as prominent players in this sector in the US. See Box 3 for further details.

#### **Box 3: Big Tech in Finance**

An emerging trend in the US is the presence of large technology firms or 'Big Tech' companies providing credit facilities and loans to small businesses and consumers. For example, Lending DocAI is a mortgage lending tool developed by Google Cloud to help mortgage companies speed up the process of evaluating a borrower's income and assets using machine learning (ML) models to automate routine document reviews.<sup>26</sup> Amazon maintains a credit facilities programme under Amazon Lending for sellers on its platform. There are also third-party firms that cater solely to Big Tech platforms, such as Accrume, a digital lending platform that provides financing solely to third-party sellers on Amazon's platform.<sup>27</sup>

- China** is another major hub for digital banking and alternative finance services in APEC, with 163 firms headquartered in-market or 5.4% of the APEC total. Notably, China's P2P lending market saw explosive growth around the mid-2010s. Digital P2P lending firms were heralded as a boon to the local financial sector due to their ability to improve access to finance for SMEs and underbanked populations until a wave of scandals and mass defaults in 2017/2018 saw regulators intervene, leading many surviving P2P lenders to pivot into other service functions like asset management and cryptocurrency.<sup>28</sup> Chinese regulators have also played

<sup>23</sup> Open Banking Excellence (2021) The state of open banking in LatAm, <https://www.openbankingexcellence.org/blog/the-state-of-open-banking-in-latam/>

<sup>24</sup> Access Partnership team analysis of Pitchbook data.

<sup>25</sup> Column, (n/a) about, <http://column.com>; HedgeLab (n/a), <http://www.hege.so>

<sup>26</sup> Google Cloud (n/a) Lending DocAI, <https://cloud.google.com/solutions/lending-doc-ai>

<sup>27</sup> Amazon Seller Central (n/a), Seller Lending Program,

[https://sellercentral.amazon.com/gp/help/external/help.html?itemID=ZN5DX64LP2QYZ69&ref=efph\\_ZN5DX64LP2QYZ69\\_cont\\_G2](https://sellercentral.amazon.com/gp/help/external/help.html?itemID=ZN5DX64LP2QYZ69&ref=efph_ZN5DX64LP2QYZ69_cont_G2)

<sup>28</sup> Kapronasia (2020) Reflecting on what went wrong with P2P lending in China, <https://www.kapronasia.com/china-banking-research-category/reflecting-on-what-went-wrong-with-p2p-lending-in-china.html>;

an important role in the local digital banking sector, this time leading the wave of special licensing frameworks for digital banks in Asia, with Big Tech-backed digital banks such as Tencent's WeBank and Alibaba's MyBank among the leading players. Other types of services offered in this segment include companies providing credit evaluation tools using data mining and ML algorithms, crowdfunding platforms for consumer assets like property and cars, online credit facilities via mobile phones, online credit management platforms, micro-finance banking services, cloud-based credit monitoring and risk management tools for retail loans, unsecured credit loan platforms, peer-to-industrial chain lending platforms, and many more.

- **Mexico** has 99 firms headquartered in-market in this segment, or 3.3% of the APEC total. Alternative financial services like P2P lending and crowdfunding platforms are popular in Mexico, driven in part by low banking penetration and underutilisation of formal financial services.<sup>29</sup> The total transaction value of the alternative lending segment in Mexico is projected to reach USD234.4 million in 2022 and will see an compound annual growth rate (CAGR) of 3.86% between 2022 and 2026.<sup>30</sup> Notable players include Konfio, a financing platform that gained rapid popularity during the COVID-19 crisis among SMEs struggling to access government support and traditional bank financing,<sup>31</sup> Prestadero, a popular P2P lending platform that offers competitive rates on loans and investments and a popular alternative to traditional bank services,<sup>32</sup> and Donadora, a crowdfunding platform for social causes.<sup>33</sup> Mexico has also seen a rise in digital banks, such as Kubo, Klar, and Fondeadora, among others, following the introduction of its overarching FinTech Law 2018, which laid the foundation for various FinTech services, including digital-only banks.

### *Domestic Hubs for Digital Banking and Alternative Finance*

With respect to digital banking and alternative finance services as a share of the domestic FinTech market, a slightly different set of economies appear. While **Mexico** remains a prominent market for digital banking and alternative finance, with firms headquartered in-market accounting for more than half (53.5%) of domestic FinTech firms, economies like **Peru** also appear as major domestic hubs, with digital banking and alternative finance services respectively accounting for 33.57% and 33.33% of their local FinTech market.

In **Peru**, while traditional banks remain the main source of loans for companies, the use of alternative financing options, such as digital loans and crowdfunding platforms, is becoming increasingly popular, especially among SMEs.<sup>34</sup> Adoption appears to be driven by slow access to credit from traditional banks and flexible repayment conditions offered by alternative lending

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Mckinsey (2018) What today's shakeout in China's P2P lending market means for FinTech, <https://www.mckinsey.com/cn/our-insights/perspectives-on-china-blog/what-todays-shakeout-in-chinas-peer-to-peer-lending-market-means-for-FinTech>

<sup>29</sup> BIS (2020) The dawn of FinTech in Latin America: landscape, prospects, and challenges.

<sup>30</sup> Statista (2022) Alternative lending – Mexico, <https://www.statista.com/outlook/dmo/FinTech/alternative-lending/mexico>

<sup>31</sup> Reuters (2021) Mexican FinTech Konfio says now worth \$1.3 bln with new capital, <https://www.reuters.com/article/mexico-konfio-idUSL1N2QV1VZ>

<sup>32</sup> Finovate (2021) Cinco de Mexico: 5 of the region's top FinTechs, <https://finovate.com/cinco-de-mexico-5-of-the-regions-top-FinTechs/>

<sup>33</sup> Mexico Business News (2021) Donadora, unlocking fundraising access to everyone,

<https://mexicobusiness.news/finance/news/donadora-unlocking-fundraisings-access-everyone>

<sup>34</sup> OECD (2022) financing SMEs and Entrepreneurs 2022 - Peru, <https://www.oecd-ilibrary.org/sites/2b9cb6d3-en/index.html?itemId=/content/component/2b9cb6d3-en>

platforms.<sup>35</sup> Several emerging players in this space are using alternative data or non-traditional collateral to offer loans. For example, InstaCash is a lending marketplace that accepts a pre-authorized line of credit from banks as collateral, while Kashin is a micro-lending platform that provides small loans to underbanked individuals and controls for risks using social reputation scores and smartphone-based variables.<sup>36</sup> Digital banks are also becoming popular choices in this segment, with companies like Ligo<sup>37</sup> leading the sector in offering personal accounts and card services to its users. Additionally, we note that financing for this segment in Peru came predominantly from venture capital firms, followed by accelerators and incubators.<sup>38</sup>

When we consider the share of all digital banking and alternative finance firms operating in the economy regardless of headquarters location, a different picture emerges, with **Viet Nam** and the **US** appearing as major markets. Firms in this segment account for 34.91% of Viet Nam's domestic market and 32.88% of the US's domestic market. This suggests that both the US and Viet Nam have a high number of foreign firms in this segment. For Viet Nam, the majority of foreign firms are from neighbouring Southeast Asian economies like Indonesia and Singapore. An example is Funding Societies, a P2P lending platform headquartered in Singapore specialising in short-term SME financing. In the US, an example of a foreign firm is Finastra, a popular digital lending platform offering solutions in retail banking, transaction banking, lending, and treasury capital markets, headquartered in the United Kingdom.<sup>39</sup>

### 1.1.3 WealthTech

WealthTech combines the use of advanced data analytic solutions like AI and big data to provide flexible and cost-effective alternatives to traditional wealth management and financial advisory services. It enables greater access to investment tools, strategies, and services that were typically available only to wealthy or high-net-worth individuals for a wider base of consumers, including first-time investors and under-tapped segments like women. The ease of use and popularity of WealthTech solutions has seen the industry grow exponentially in the past couple of years, with global funding almost tripling from USD0.6 billion to USD1.6 billion between 2020 and 2021.<sup>40</sup>

The variety of innovations present within the WealthTech segment can be broadly categorised into three main activities: online investing, trading and exchanges, and wealth management tools.

- Online investment platforms are typically managed by wealth management firms that leverage advanced analytics to automate asset allocation and cater to clients' risk tolerance and financial goals. This ranges from micro-investing firms that allow individuals to save, deposit, and invest at much lower thresholds with no minimum balance required, to robo-advisors that provide financial insights and sophisticated portfolio management strategies for established financial institutions and banks.<sup>41</sup>

<sup>35</sup> Gomez, G.Navvaro Barranzuela, J.A, Marchena Ojeda, L.M, Crowdlending as a financing alternative for MSMEs in Peru, [http://scielo.senescyt.gob.ec/scielo.php?script=sci\\_abstract&pid=S1390-86182022000100161&lng=e&nrm=iso&tlng=en](http://scielo.senescyt.gob.ec/scielo.php?script=sci_abstract&pid=S1390-86182022000100161&lng=e&nrm=iso&tlng=en)

<sup>36</sup> Instacash (n/a), <https://instacash.pe/es>; Kashin (n/a), <https://kashin.app/>

<sup>37</sup> Ligo (n/a) About, <https://ligo.pe/>; Financial Brand (2021) The most popular digital-only banks in the world, <https://thefinancialbrand.com/124264/the-most-popular-digital-only-banks-in-the-world-neobank-FinTech-square-revolut-monzo/>

<sup>38</sup> Access Partnership team analysis of PitchBook data

<sup>39</sup> Funding Societies (n/a) About, <https://fundingsocieties.com/>; Finastra, <https://www.finastra.com/>

<sup>40</sup> Statista (2021) Global investment activity in WealthTech, <https://www.statista.com/statistics/1313101/global-investment-activity-in-WealthTech/#:~:text=In%202021%2C%20the%20total%20value.and%200.5%20billion%20U.S.%20dollars.>

<sup>41</sup> Norman Alex (2019) WealthTech a game changer for wealth management, <https://www.normanalex.com/2019/09/23/WealthTech-a-game-changer-for-wealth-management/>

- Trading platforms range from digital brokers that seek to simplify the trading process for amateur and even seasoned investors, to those that boast access to private markets and all major global exchanges. These platforms also include firms that specialise in new asset classes like digital assets or sustainability-focused investment products.
- Wealth management tools include portfolio management platforms that allow investors to aggregate and manage their various accounts onto a single platform, platforms that aggregate useful financial and non-financial information as well as expert advice to enable individual investors and financial institutions to make better-informed investment decisions, and platforms that specialise in safekeeping investments like digital assets.

Additionally, there is a growing number of hybrid WealthTech firms that combine two or more of the activities above, such as companies that provide both automated advisory and investment services to consumers, or investment platforms that allow users to invest and share investment experience, tips, and stock sentiment on the same platform to create a community-based service.

In APEC, WealthTech forms the third largest FinTech segment after payments and digital banking/alternative finance. Overall, there are almost 2,000 firms headquartered across APEC, or 17.7% of the APEC total.<sup>42</sup> Emerging trends in this segment include increased automation of wealth management and asset allocation, increased personalisation of advisory services, and growing interest in new asset classes like digital currencies and ESG-driven investment products. Refer to the text box below for further details.

#### Box 4: Emerging Trends in WealthTech



**Advancements in robo-advisors or robo-investing platforms.** Robo-advisors or robo-investing platforms that leverage advancements in big data analytics and AI to enhance investment decision-making and automate asset allocation are increasingly introduced. Assets are allocated based on personalised investment strategies formulated from user inputs on financial goals and risk tolerance. Players include micro-investing platforms that allow individuals to start investing in a few simple steps at much lower investment thresholds, and typically do not require minimum balance-keeping or lock-in fees. Several robo-advisors and robo-investing platforms are also beginning to use gamification and P2P sharing to keep users engaged on the platform, playing into a growing behaviour of shared user experience.<sup>43</sup>



**Increasingly personalised investment solutions and new investor segments:** Emerging client segments, such as women, first-time investors, and engaged investors that express their personal values in investment decisions (e.g., investing in sustainable assets), will push many wealth-management firms to rethink services and offer more customised and holistic investment management. Many will seek to tap into new technologies that have made investment operations like direct indexing, fractional share trading, and zero or minimal online commissions more accessible and even necessary.<sup>44</sup>

<sup>42</sup> Access Partnership team analysis of PitchBook data.

<sup>43</sup> Deloitte (n/a) FinTech startups focusing on invest tech, <https://www2.deloitte.com/lu/en/pages/financial-services/articles/FinTech-startups-focusing-on-invest-tech.html>

<sup>44</sup> FinTech magazine (2022) Wealth management trends and the 'new normal', <https://FinTechmagazine.com/financial-services-finserv/wealth-management-trends-and-the-new-normal>;

Mckinsey (2022) US wealth management: a growth agenda for the coming decade, <https://www.mckinsey.com/industries/financial-services/our-insights/us-wealth-management-a-growth-agenda-for-the-coming-decade>



**Rise of private markets and new asset classes in individual portfolios.** A growing number of large private market firms are building out retail distribution capabilities and vehicles to make it easier for clients to access products previously reserved for institutional investors, such as private debt, real estate, infrastructure, and natural resources. Likewise, across APEC, there has been a rise in asset management firms and investment trading platforms that cater specifically to digital assets (e.g., digital currencies, tokens, stablecoins, etc.), driven by the latter's surge in popularity among retail investors that has seen its market capitalisation surge from USD100 billion in 2019 to over USD2.5 trillion in 2022.<sup>45</sup>

### *APEC Hubs for WealthTech*

APEC economies with a high concentration of WealthTech firms headquartered in-market include the **US; Canada; and Singapore**. Details on the size of the domestic market relative to the APEC total, as well as information on notable emerging and established players in this segment, are provided for each economy below.

- As with both payments and digital banking/alternative finance services, the **US** has one of the highest concentrations of WealthTech firms across APEC with 1,001 firms, or 51% of the APEC total. The economy is home to a number of pioneers in WealthTech, such as Acorns, an investment platform that rounded-up payment transactions to the nearest dollar and helped invest that money into a diversified fund; WealthFront, a popular automated investment management platform founded in 2011; RobinHood, a vertically integrated stock trading platform that offers cryptocurrency trading, dividend reinvestment, fractional shares, recurring investments, and IPO access; Finmason, a customisable, cloud-based WealthTech platform that uses API to connect its users to every major investment product in the world; Gemini, one of the early developers of a fully integrated cryptocurrency exchange platform that allows users to buy, store, and earn interest in cryptocurrency and has over USD25 billion in cryptocurrency under custody; and Addepar, a portfolio management platform founded in 2009 that consolidates a user's various accounts and investments and enhances them with relevant market and third-party data, among others.<sup>46</sup>
- **Canada** is another major market for FinTech firms involved in asset management and capital markets, with 180 companies or 9.17% of the APEC total. Established players include FinHaven, developer of a capital markets investment platform that leverages blockchain to simplify transactions; Irwin, an AI-based investor relationship management software provider; and WealthSimple, an online investment management platform with over CAD15 billion (USD11.26 billion) in assets under management, among others.<sup>47</sup> Emerging players have focused on new products like digital assets, cryptocurrencies, and sustainability-focused assets like green bonds and clean energy investments. This includes companies such as CoinSmart, a multi-cryptocurrency trading platform; AMI, a digital asset management platform designed to help wealth management firms navigate the world of digital assets on

<sup>45</sup> Mckinsey (2022) US wealth management: a growth agenda for the coming decade, <https://www.mckinsey.com/industries/financial-services/our-insights/us-wealth-management-a-growth-agenda-for-the-coming-decade>

<sup>46</sup> Acorns, <https://www.acorns.com/>; Robinhood, <https://robinhood.com/us/en/>; Finmason, <https://www.finmason.com/about>; Gemini, <https://www.gemini.com>

<sup>47</sup> FinHaven, <https://www.finhaven.com/>; Irwin, <https://www.getirwin.com/>; <https://www.wealthsimple.com/en-ca>;

behalf of their clients; and CoPower, developer of a sustainable investment platform intended to simplify clean energy investing, among others.<sup>48</sup>

- **Singapore** is also a major hub for WealthTech, with 178 companies or 9.07% of the APEC total. Popular players include EndowUs, a robo-advisor and investment firm that invests funds from a user's Central Provident Fund and Supplementary Retirement Scheme<sup>49</sup> accounts; StashAway, a robo-investing platform that offers users personalised investment portfolios with no minimum balance requirements or lock-in fees; Bambu, a robo-advisory platform for financial institutions that uses a proprietary ranking algorithm to recommend relevant investment ideas for its clients based on a personalised risk profile; and SmartKarma, a popular investment insight tool for professional investors.<sup>50</sup> Similar to Canada and the US, emerging players in the segment include firms offering asset management and trading platforms for cryptocurrencies and other digital assets, such as AscendEX, ADDX, and BitGet, among others.

### *Domestic Hubs for WealthTech*

When we consider WealthTech firms headquartered within the economy as a share of the local FinTech market, an entirely different set of economies appear, with major markets including economies like **Australia; Hong Kong, China; and Thailand**. This suggests that WealthTech is a particularly vibrant FinTech segment in economies across APEC, irrespective of market size (in terms of the total number of firms). Further details on each economy's segment size and notable established and/or emerging players are provided below.

- In **Australia**, WealthTech accounts for 33.99% of FinTech firms headquartered in-market. Notable players have focused on expanding investment and wealth management access to the masses. This includes companies like Grow Inc., developer of a savings and investment management platform that links bank accounts, rounds-up spare change, tracks and accesses market tips, and sets funds aside as superannuation funds for the future; SuperHero, developer of an investment platform aimed at making investment accessible and understandable for everyone; and SelfWealth, a company engaged in the provision of flat fee online securities brokerage services and also offers accounts for those below the age of 18 for investors to invest on their behalf, among others. Notable emerging players in investment management services include companies like PropHero, an AI-enabled digital property investment platform founded in 2020 that handles the due diligence and acquisition process of transactions and aims to make property investing simple and transparent; Bloom Impact Investing, a company founded in 2019 with the aim of making climate impact investing accessible; and Amasa, a company founded in 2018 that provides users with a platform to aggregate their various portfolios and access and select community approved DeFi investment portfolios that best suit their goals and risk tolerance.<sup>51</sup>
- In **Hong Kong, China**, WealthTech firms account for 37.8% of the domestic FinTech market. The market is home to several leading WealthTech firms in Asia, such as Aquumon, a leading

<sup>48</sup> CoinSmart, <https://www.coinsmart.com/>; AMI, <https://www.amipro.ca/>; CoPower, <https://copower.me/>

<sup>49</sup> The Central Provident Fund is Singapore's compulsory savings and pension plan for citizens and permanent residents; The Supplementary Retirement Scheme, is a voluntary savings scheme for retirement available to citizens and permanent residents.

<sup>50</sup> EndowUs, <https://endowus.com/>; StashAway, <https://www.stashaway.sg/>; Bambu, <http://www.bambu.co/>

<sup>51</sup> PropHero, <https://prophero.com.au/>; Bloom Impact Investing, <https://www.bloom-impact.com/>; AMasa, <https://www.amasa.io/>

big data and quantitative technology robo-advisor and one of the first to ever receive full licensing provisions from the US; Hong Kong, China; and China; and Quantifeed, a leading robo-investment platform that offers a library of trading strategies, thematic investments, and portfolio allocations to major banks, brokers, and wealth managers in Asia.<sup>52</sup> Emerging players in the sector include companies like Diginex Solutions, an ESG-reporting company that uses multiple blockchain-based platforms to capture granular information on supply chain management, as well as companies providing asset management and trading services for digital assets, such as Aspen Digital, an online platform for safekeeping digital assets, and Sigmadex Foundation, operator of a cross-chain, multi-asset marketplace built on a decentralised and community-driven liquidity protocol.<sup>53</sup>

- In **Thailand**, WealthTech firms make up 30.91% of the domestic FinTech market. WealthTech companies in Thailand offer a range of services and technology solutions that are comparable to those of wealthier, more mature WealthTech markets despite its considerably smaller size. Notable players include RoboWealth, a pioneer in robo-advising operating as a mutual fund brokerage securities company under supervision from Thailand's Securities and Exchange Commission (SEC); Finnomena, an all-in-one digital wealth management platform aimed at the mass market; StockRadars, a mobile-based stock analysis application designed to mitigate portfolio risks; and T-Box, operator of a capital markets platform that allows users to buy, sell, and trade high-quality digital tokens,<sup>54</sup> among others.

Accounting for all WealthTech firms operating within an economy regardless of headquarter location, **Peru** emerges, with the segment accounting for 38.98% of its local FinTech market. The entry of Peru indicates WealthTech to be a particularly important segment for the local economy despite not having a high percentage of WealthTech firms headquartered in the economy. Many of the foreign WealthTech firms are from neighbouring economies like Chile, Argentina, and Colombia.<sup>55</sup> An example of one such firm is Finvox, a Chilean-headquartered online trading platform designed to promote the expansion of financial services to the masses.<sup>56</sup>

#### 1.1.4 Other Innovations

Integration of digital technologies into financial services and related services has given rise to a variety of other innovations beyond the three segments above. This includes innovations like InsurTech<sup>57</sup>, RegTech<sup>58</sup>, financial administrative tools, community management platforms, project

<sup>52</sup> Aqumon, <https://www.aqumon.com/en/>; Quantifeed, <https://www.quantifeed.com/>

<sup>53</sup> Diginex Solutions, <https://www.diginex.com/>; Aspen Digital, <https://www.aspendigital.co/>; Sigmadex Foundation, <https://www.sigmadex.org/>

<sup>54</sup> RoboWealth, <https://www.robowealth.co.th/>; Finnomena, <https://www.finnomena.com/>; StockRadars, <https://www.stockradars.co/>; T-box, <https://tbox.net/>

<sup>55</sup> Access Partnership team analysis of PitchBook data.

<sup>56</sup> Capitalizarme, <https://www.capitalizarme.com/>

<sup>57</sup> InsurTech is a combination of the words 'insurance' and 'technology' and refers to a community of technology-led companies that are using technology innovations to improve and disrupt the current insurance industry model. Source: <https://www.investopedia.com/terms/i/insurtech.asp>

<sup>58</sup> RegTech is a combination of the words 'regulatory' and 'technology' and refers to a community of technology-led companies that manage and perform regulatory processes within the financial industry through technology, with main functions involving monitoring, reporting, and compliance, <https://www.investopedia.com/terms/r/regtech.asp>

management tools, and other services that assist financial sector companies in offering their products and services.

### *APEC Hubs for Other Innovations*

There are 1,298 firms in other innovations headquartered in APEC, or 11.7% of the APEC total.<sup>59</sup> Leading economies in this segment include the **US** with 42.06% (546 firms) of the APEC total, **China** with 19.9% (259 firms), and **Canada** with 10.7% (137 firms). Examples of notable development in this segment within each economy are provided below.

- In the **US**, the InsurTech industry is a particularly vibrant sector within this segment. InsurTech players leverage new technologies to innovate and disrupt the current industry mould. The ability to process and mine vast, diverse sources of data have allowed InsurTechs to offer increasingly personalised products and better customer experiences. For example, companies like GoHealth and eHealth provide consumers with a marketplace of health insurers and use proprietary ML algorithms to help users find the option best suited to their needs. Other companies, like Gabi, provide users with a platform to manage their current policies and present better options and opportunities to switch policies. There is also a growing number of firms that specialise in providing software solutions for insurance providers. This includes companies like Screenshot, developer of a claims management software designed to transform end-to-end claims processes through digitisation and intelligent automation; Gradient AI, a software-as-a-service (SaaS) predictive analytics platform designed to help commercial insurers automate and improve underwriting results, reduce claim costs, and improve operational efficiencies; Bees360, a company that combines deep-learning and drone technology to make the claim processes for home property more accurate, cost-effective, and efficient, and many more.<sup>60</sup> Additionally, digital innovations in the financial sector have led to the emergence of non-traditional players in the insurance industry offering policies to cover new types of products. For example, Gemini, the popular US-based cryptocurrency exchange platform, offers an insurance policy against the theft of digital assets from its wallet as a result of a security breach, data hack, or employee theft.<sup>61</sup>
- In **China**, the RegTech industry has seen a number of unique applications as the sector shifts from a compliance management focus to active prevention and control. The sector is also seeing growing interest from regulators, with China's central bank noting the need to accelerate the comprehensive application of RegTech as part of its FinTech development plan for 2022-2025.<sup>62</sup> Notable players include AHI-FinTech and DaoKou JinKe. The former provides an AI-prediction model to offer anti-money laundering/counter-terrorism financing (AML/CTF), anti-fraud, smart audit, and operational risk assessment services. The latter provides a financial risk management and enterprise mapping software that offers risk management tools like constraint monitoring systems, illegal fundraising detection, and an

<sup>59</sup> Access Partnership team analysis of PitchBook data.

<sup>60</sup> GoHealth, <https://www.gohealth.com/>; Gabi, <https://www.gabi.com/>; Screenshot, <http://www.screenshotclaims.com/>; Gradient AI, <https://www.gradientai.com/technologyad5e50f2>; Bees360, <https://www.bees360.com/>

<sup>61</sup> Gemini (2018) Digital assets insurance, <https://www.gemini.com/blog/digital-assets-insurance>

<sup>62</sup> China Banking News (2020) RegTech in China shifts from compliance management to active control government report, <https://www.chinabankingnews.com/2020/09/09/RegTech-in-china-shifts-from-compliance-management-to-active-control-government-report/>

China banking news (2022) Chinese central bank releases 2022-2025 FinTech development plan, <https://www.chinabankingnews.com/2022/01/06/chinese-central-bank-releases-2022-2025-FinTech-development-plan/>

AI-powered enterprise map that captures upstream and downstream entity relationships, among other services.<sup>63</sup>

- In **Canada**, there is an emerging sub-segment of firms leveraging technology to provide a diverse range of financial administrative services to serve the financial sector and other industries. For example, Zafin is a provider of a SaaS cloud-based software that allows banks and financial institutions to manage products, pricing, billing, and risk analytics across the entire client relationship on a single platform. NexJ Systems is an enterprise customer management solutions firm for financial institutions that offer services ranging from customer relationship management to know-your-customer and client onboarding processes. Railz is an accounting and financial data API that collects financial data and business accounting information from all the major local accounting service providers on third parties. The firm enables financial institutions to make better informed decisions, such as whether to provide financing to an SME, based on real-time information retrieved by Railz's API.<sup>64</sup>

### *Domestic Hubs for Other Innovations*

When we consider the number of firms in this segment that are headquartered in-market as a share of the domestic FinTech market, major economies include **Chile** (37.84%); **China** (28.34%); and **Chinese Taipei** (28.21%). Examples of notable developments within this segment for Chile and Chinese Taipei are provided below.

- In **Chile**, the domestic RegTech and financial administrative services sectors appear to be particularly vibrant due to companies like FinToc, Chipax, RegCheq, and Ceptinal, many of which receive backing from venture capital firms.<sup>65</sup> FinToc develops APIs designed to integrate with financial institutions to provide payments, personal finance management, KYC processes, and consumer credit services linked to a user's bank account. Chipax helps businesses better manage their cash flow and other financial statements by automating certain back-end processes like connecting sales and purchase invoices and managing expenses, among other operations. RegCheq and Ceptinal are RegTech firms that automate AML regulatory compliance checks and support due diligence management for financial sector companies.<sup>66</sup>
- In **Chinese Taipei**, a considerable portion of this segment consists of companies that focus on research and development of the underlying technologies that are used in FinTech services, such as AI, AML, cybersecurity, blockchain, cloud services, and advanced data analytics. This includes companies like Appier, a leading AI-driven marketing platform for consumer engagement that offers services across several industries, including finance and insurance<sup>67</sup>; CoolBitX, developer of blockchain and crypto-asset solutions, including a mobile hardware wallet and messaging service that assists digital asset providers to share required

<sup>63</sup> KPMG (2021) 50 Leading FinTech enterprises in China, <https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2021/01/china-FinTech-50.pdf>;

Ahi-FinTech, <https://www.ahi-FinTech.com/index.html>; Daokou Jinke, <https://www.daokoujinke.com/>

<sup>64</sup> Zafin, <https://zafin.com/>; NexJ Systems, <http://www.nexj.com/>; Railz, <https://railz.ai/>

<sup>65</sup> Access Partnership team analysis of PitchBook data

<sup>66</sup> Chipax, <https://www.chipax.com/>; Fintoc, <https://fintoc.com/>; Ceptinel RegTech, <http://www.ceptinel.com/#/>; RegCheq, <https://regcheq.com/en/home/>

<sup>67</sup> Appier, <https://www.appier.com/en/industry/finance-insurance/>

compliance data that is in line with global regulatory standards; NexTrex, a company that provides cloud-based cash flow and financial management software to MSMEs; and Xrex, a developer of blockchain-driven products to help crypto-exchanges and trading platforms facilitate cross-border trade and transfer of digital assets, among others.<sup>68</sup>

Accounting for all firms operating in this segment regardless of headquarter location, **Mexico** emerges as a notable market, with firms operating in this segment accounting for 24.92% of its domestic market. This suggests that a significant number of foreign firms in this segment are operating in the economy. Foreign firms operating in Mexico are primarily from the US, Latin America, and Europe. An example of one such firm is Jeeves, an all-in-one financial stack platform to help businesses grow. The company is headquartered in New York, US, with operations in Mexico, Canada, Columbia, Chile, the United Kingdom, and parts of Europe.<sup>69</sup>

## 1.2 FinTech Ecosystem Stakeholders

This section identifies five major stakeholders in the FinTech ecosystem and their respective roles in shaping FinTech innovation and policies. Specifically, they are:

- **Central banks and financial regulators**, and their role in setting the agenda or regulatory tone for an emerging FinTech activity;
- **FinTech start-ups and non-traditional financial sector players** like technology companies and telecommunication service providers that challenge the status quo;
- **Banks and financial institutions** that provide funding and financial infrastructure (e.g., accounts, cards, and settlement systems) that FinTech services rely on;
- **Retail consumers** that drive demand for new, better, and more innovative offerings; and
- **International organisations** and their role in advancing regional frameworks and collaboration, as well as helping to set common standards and international good practices.

### 1.2.1 Central Banks and Financial Regulators

Central banks, supervisory commissions, and monetary authorities can have one of the biggest influences on the growth and development of the FinTech sector. They help set the domestic agenda for the overall sector, identify key policies and regulations that govern the sector, and deploy resources to encourage development in a specific area, especially in times of need. For example, in May 2020, MAS and several other government stakeholders jointly launched an SGD6 million FinTech solidarity Grant to help Singapore-based FinTech firms maintain their operations and retain their employees during the COVID-19 pandemic. This was in addition to a larger SGD125 million support package for the wider financial and FinTech sector to deal with the immediate challenges of COVID-19 and to position the sector for a strong recovery and future growth.<sup>70</sup>

In economies where regulatory enforcement is strong, financial regulatory authorities also have substantial influence in shaping the emergence of new technologies and players in the FinTech

<sup>68</sup> Nextrek, <https://www.nextrek.co/>; Xrex, <https://xrex.io/>

<sup>69</sup> Jeeves, <https://www.tryjeeves.com/>

<sup>70</sup> MAS (2020) Covid-19 support package for FinTechs, <https://www.mas.gov.sg/development/FinTech/covid-19-support-package-for-FinTechs>

sector by providing clarity and setting parameters that can encourage adoption. For example, in Australia, government policies on open banking standards and data portability rights will help to drive adoption within the FinTech and banking sectors. A 2020 survey of key industry leaders in the financial sector found that 71% of industry respondents intended to capitalise on these policies, including the Consumer Data Right<sup>71</sup> to develop new services for their companies that leverage open banking standards, with 60% planning to do so within the year.<sup>72</sup>

Central banks and financial regulators can also influence the emergence of non-traditional players in the financial/FinTech sector. For example, in recent years, central banks and regulators in APEC economies like Australia; China; Japan; Korea; and the US have voiced concerns over the influence of large technology companies, or Big Tech, in the financial/FinTech sector, with some choosing to introduce regulations to widen their oversight authority over these non-traditional financial players.

Additionally, central banks and financial regulatory authorities have the ability to introduce programmes that have a direct impact on the growth and innovation of the FinTech sector. For instance, financial authorities in many APEC economies are responsible for establishing regulatory sandboxes that can help both regulators and innovators better understand the risks and rewards of a new FinTech innovation. They also have the ability to set domestic agendas that encourage the use of FinTech to support other domestic policy agendas, such as financial inclusion efforts and increasing access to financing for SMEs or underbanked populations. For example, the central bank of Papua New Guinea has introduced programmes on digital financial literacy and AgriTech training to help improve financial inclusion efforts and build a digitally aware society. Likewise, in Indonesia, the Financial Service Authority (Otoritas Jasa Keuangan) has developed a digital financial curriculum to improve financial literacy and inclusion rates and improve the overall financial well-being of its population.<sup>73</sup>

## 1.2.2 Start-Ups and Non-Traditional Financial Sector Players

FinTech start-ups have helped reimagine the relationship between consumers and financial service providers. Their ability to address many existing pain points long overlooked by established institutions, and offer better, more accessible, and convenient solutions on how consumers save, borrow, invest, manage, transfer, and pay have made them essential to the current financial system. By being digital-first (and often digital-only), FinTech companies have been able to expand into new mediums and channels for customer acquisition, drive significant reductions in cost to serve through process and workforce optimisation, and offer segment-specific propositions at a scale that matches their customer base. FinTech companies' innovative use of data also allows for more personalised products and a better consumer experience, especially in the area of retail banking, payments, wealth management, and insurance. In economies where there are large unbanked or underbanked populations and a consolidated financial sector, the entry of new FinTech start-ups that challenge the status quo can improve the overall competitiveness of the sector, introduce new innovations to

<sup>71</sup> See Australia's landscape summary on page 68 for further detail on the Consumer Data Right.

<sup>72</sup> Frollo (2020) The state of Open Banking Report 2020, <https://frollo.com.au/open-banking/state-of-open-banking-report-2020/>

<sup>73</sup> APEC (2021) APEC Financial Services: Increasing APEC's FinTech and RegTech Capabilities Post-COVID-19, [https://www.apec.org/docs/default-source/Publications/2021/10/APEC-Financial-Services/221\\_GOS\\_APEC-Financial-Services-Increasing-APECs-FinTech-and-RegTech-Capabilities-Post-COVID-19.pdf](https://www.apec.org/docs/default-source/Publications/2021/10/APEC-Financial-Services/221_GOS_APEC-Financial-Services-Increasing-APECs-FinTech-and-RegTech-Capabilities-Post-COVID-19.pdf)

the financial service industry, and support domestic agendas like financial inclusion and greater SME financing.

The digital transformation of financial services has not been limited to start-ups and existing financial sector players. Non-traditional entrants such as technology companies and telecom companies have also begun to foray into the sector. In the US, Japan, and China, Big Tech<sup>74</sup> companies such as Amazon, Google, Meta, Rakuten, and Tencent have expanded into the FinTech/ financial sector with offerings in the payments, credit, and wealth management segments.<sup>75</sup> A major competitive advantage that these firms have is their significant user bases established from non-financial services, offering masses of consumer data.<sup>76</sup> Telecom companies are also among the key players in enabling the thriving development of FinTech. Many FinTech innovations, products, services, and technology advancements are rooted in the ability to operate through a digital or mobile-first model, underpinned by the rapid acceleration of Internet connectivity and mobile penetration. For example, in Indonesia, telco provider Indosat ventured into mobile wallet services in the early 2010s, partnering with third parties and banks to offer mobile payment services. The company also tapped into its customer database to offer micro-insurance and micro-lending services.<sup>77</sup>

Additionally, we are also beginning to see partnerships between technology and telecom companies in their bid to enter the financial service sector. For example, the partnership between Grab, a ‘super-app’ company providing users with transportation, food delivery, and digital payments services across Southeast Asia, and Singtel, a leading telecommunications provider in Asia, to provide digital banking services in Singapore and Malaysia.<sup>78</sup>

### 1.2.3 Banks and Financial Institutions

While the growth of FinTech can be seen as a disruption to the incumbent financial institutions, they do not necessarily replace existing financial service providers, with many existing FinTech solutions still heavily reliant on incumbent financial institutions as facilitators of transactions. For example, in China, the widespread and rapid adoption of digital wallets like WeChat Pay and AliPay was fostered by high levels of bank account ownership, thereby enabling the former to ride on existing financial infrastructure in the form of accounts, bank cards, and interbank clearing and settlement systems.<sup>79</sup>

Incumbent financial institutions are also evolving with the FinTech market by building in-house FinTech solutions, acquiring stakes in high-growth FinTech companies, or partnering with new,

<sup>74</sup> Big Tech refers to large companies whose primary activity is digital services. Source: <https://www.bis.org/speeches/sp211006.htm#:~:text=The%20BIS%20and%20Financial%20Stability,primary%20activity%20is%20digital%20services>

<sup>75</sup> Amazon Lending, <https://sell.amazon.com/programs/amazon-lending>

Google Lending Doc AI, <https://cloud.google.com/solutions/lending-doc-ai>

Meta Pay, <https://pay.facebook.com/>

Rakuten FinTech Group Company, <https://global.rakuten.com/corp/about/company/FinTech.html>;

Tencent FinTech services, <https://www.tencent.com/en-us/business.html>

<sup>76</sup> International Monetary Fund (2022) BigTech in Financial Services, <https://www.imf.org/-/media/Files/Publications/FTN063/2022/English/FTNEA2022002.ashx>

<sup>77</sup> Indosat Ooredoo, (n/a) Lifestyle – Financial Services, <https://indosatooredoo.com/portal/id/psdigitalifestyle>

<sup>78</sup> Grab (2020) Grab-Singtel consortium to set up dedicated team to build Singapore’s next-generation digital bank, <https://www.grab.com/sg/press/others/grab-singtel-consortium-to-set-up-a-dedicated-team-by-2021-to-build-singapores-next-generation-digital-bank/>; Straits Times (2022)

Grab-Singtel and Sea Group consortia win Malaysia digital bank licenses, <https://www.straitstimes.com/business/banking/grab-singtel-and-sea-group-consortia-win-malaysia-digital-bank-licences>

<sup>79</sup> CGAP (2019) China digital payments revolution, <https://www.cgap.org/research/publication/china-digital-payments-revolution>

popular entrants to expand their service offerings. For example, in 2020, DBS, one of the largest banks in Singapore, formed a partnership with the digital payments partner Fave to offer consumers better cashback options. Users of the bank's digital wallet can scan SGQR codes at Fave-partnered merchants to receive instant cashback savings of up to 20%. For Fave-partnered merchants, the consolidation and acceptance of e-payments allow for better payment reconciliation, customer insights, and demographic data.<sup>80</sup> Additionally, financial institutions like banks, venture capital funds, and others remain an important source of funding for FinTech start-ups, offering banking-related services and resources that can facilitate their growth.

#### 1.2.4 Retail Consumers

Consumer demand drives much of the innovation seen across the FinTech sector, from payments and wealth management to credit financing and other sectors such as insurance, marketing, and property management. Innovations presented are generally focused on making sure the service is more convenient, affordable, accessible, personal, and secure for the average user. Network effects are also key for certain FinTech innovations, such as payment methods and personalised offerings, as they help cultivate demand and enable companies to reach economies-of-scale levels that make the innovation worthwhile. Improved data rights and the decentralisation of finance are also driving the availability of new products like cryptocurrency, marketplace financing/crowdfunding, and related services. Their prevalence in certain economies has required regulatory authorities to introduce new policies to safeguard consumer rights and AML/CTF efforts.<sup>81</sup>

#### 1.2.5 International Organisations

International organisations play a critical role in facilitating the setting of standards and processes across economies, encouraging the adoption of good practices and enabling cross-border financial products and services. Institutions such as the Bank for International Settlements (BIS) go beyond the provision of vital research and have been actively involved in driving tangible cooperation and discussions in the FinTech space. For example, the BIS Innovation Hub and Singapore's MAS are developing a prototype platform for supervisory analytics for banking supervision. The prototype will be published and shared with the public for further testing, customising, and scaling.<sup>82</sup>

International organisations can also provide critical aid and support to economies in implementing domestic FinTech agendas. Organisations such as the Alliance for Financial Inclusion (AFI), the ASEAN Financial Innovation Network (AFIN), ADB, WB, and International Finance Corporation (IFC), among others, support domestic FinTech growth and innovation through various channels, including the provision of funds for capacity-building, supporting digital and financial literacy programmes, and research that helps bring more service, such as microfinance, to communities.<sup>83</sup>

<sup>80</sup> The Strait Times (2020) DBS, Singtel partner Fave on digital payments, cashback, <https://www.straitstimes.com/business/banking/dbs-singtel-partner-fave-on-digital-payments-cashback>

<sup>81</sup> Gowling WLG (2022) Payment Services and Crowdfunding Services Are Now Regulated Under Canada's Anti-Money Laundering Framework, <https://gowlingwlg.com/en/insights-resources/articles/2022/canada-anti-money-laundering-framework-regulation/>

<sup>82</sup> BIS (2022) BIS Innovation Hub and Monetary Authority of Singapore develop prototype supervisory analytics platform, <https://www.bis.org/press/p220331.htm>

<sup>83</sup> APEC (2021) Harnessing FinTech Skills of Women-led MSMEs in Promoting Inclusive Growth Against COVID-19, [https://www.apec.org/docs/default-source/publications/2021/4/harnessing-finTech-skills-of-women-led-msmes-in-promoting-inclusive-growth-against-covid-19/221\\_ppwe\\_harnessing-finTech-skills-of-women-led-msmes.pdf?sfvrsn=1251bde6\\_1](https://www.apec.org/docs/default-source/publications/2021/4/harnessing-finTech-skills-of-women-led-msmes-in-promoting-inclusive-growth-against-covid-19/221_ppwe_harnessing-finTech-skills-of-women-led-msmes.pdf?sfvrsn=1251bde6_1)

## 2. FinTech Policies and Regulations in APEC

Appropriate policies and regulations can support and promote the growth of FinTech while allowing regulators to protect consumers and maintain market stability. Across APEC, economies have introduced a variety of approaches to governing the FinTech sector with these objectives in mind. Broadly, these approaches fall into two types:

- Policy frameworks and regulations that seek to create an **enabling environment** for FinTech and directly regulate FinTech activities. This includes policies such as domestic FinTech strategies, innovation facilitators, or bi-/multi-lateral FinTech cooperation agreements, as well as rules that regulate specific FinTech activities or novel services.
- Policy frameworks and regulations that are **foundational** to the wider digital economy and govern all types of digital transactions, including those in the FinTech sector. This includes laws on data privacy and protection, cybersecurity, intellectual property, consumer welfare, and competition, as well as digital native initiatives, such as e-KYC frameworks, digital identities, and algorithm guidelines.

This section covers both aspects in detail. Section 3.1 provides a qualitative review of the various FinTech-enabling policies and regulations that APEC economies have introduced to drive FinTech growth and innovation, while Section 3.2 provides an overview of the foundational frameworks and regulations that govern the wider digital economy. We note that the diverse mix of enabling and foundational frameworks observed within each economy supports the notion that there is no one-size-fits-all policy or regulatory solution to support and govern the FinTech sector. Instead, the assortment of enabling and foundational policies and regulations that APEC economies have chosen is likely due to a number of domestic contexts, such as regulatory and socioeconomic priorities.

### 2.1 Enabling Policies and Regulations

#### 2.1.1 Policies to Nurture the FinTech Industry

##### *Domestic FinTech Strategies*

Domestic FinTech strategies can be useful tools in shaping and promoting FinTech growth as they help economies set out the overarching vision for the sector, establish key objectives and goals, and identify relevant ministries and implementation measures. To this end, most APEC economies have introduced a domestic FinTech strategy that is periodically updated and typically published by the central bank or main financial regulator.

Domestic strategies put forth by advanced member economies tend to place emphasis on deepening the application of digital technologies in the financial sector and strengthening the economy's position as a global FinTech hub. These plans also tend to include initiatives to attract foreign direct investment and support the export of FinTech services. APEC Member economies that fall into this category include Australia; Hong Kong, China; Japan; Singapore; and Chinese Taipei.

In developing economies, domestic FinTech strategies typically focus on broad initiatives that encourage the digital transformation of the financial sector, promote digital financial inclusion, and support the growth of the digital economy. For example, Malaysia's Financial Sector Blueprint 2022-2026, published by the central bank, Bank Negara Malaysia, lists finance for inclusion and finance for

transformation as two of its three main themes.<sup>84</sup> In Indonesia, the central bank, Bank Indonesia (BI), published a Payment Systems Blueprint to navigate the payments sector in the era of digital economy and finance and support financial inclusion efforts. See **Box 5** for further details.

#### **Box 5: Bank Indonesia's Payments Strategy for Digital Financial Adoption and Inclusion**

In 2019, BI published the Indonesia Payment Systems Blueprint 2025 to serve as the central bank's policy direction on developing payment systems for the era of the digital economy and digital finance. The Blueprint sets out a six-year strategy (2019-2025), with five core 'visions' for the development of Indonesia's payments landscape, and identifies key initiatives to support these visions.

Key milestones to date include the introduction of a fast payment system that is accessible to both banks and non-bank payment services providers, the introduction of domestic standards for Open API and QR-code payments that support interoperability between banks and non-bank payment service providers, the introduction of BI Sandbox 2.0, which consists of a regulatory sandbox, innovation lab, and industrial sandbox, and reforms to several payments regulations, including payment service providers and system operators. An outcome of these milestones has been an uptake in the use of digital financial services, further supporting BI's digital financial inclusion efforts.<sup>85</sup>

Only a handful of economies, including the US; Canada; New Zealand; and Korea, have not published a domestic FinTech strategy in recent years. There are a few possible reasons for this. For example, it may be that the FinTech sector in these economies is deemed to have 'taken off', and thus the regulator has opted to focus on more activity-specific targets instead of introducing an overarching domestic plan, with the possibility of including these targets under broader digital economy plans.<sup>86</sup> It may also be due to different policymaking processes, whereby some economies introduce new domestic plans periodically based on a fixed schedule while others take a more flexible approach, only setting out new plans when required. It may also be the case that policymakers in some of these economies are playing catchup with consumer behaviour and industry innovation.<sup>87</sup>

#### *Government-led Innovation Facilitators*

Rapidly evolving business models and novel uses of data can pose a challenge for regulators to keep pace. At the same time, over-regulation or regulatory uncertainty can deter investment and make it difficult for FinTech start-ups to innovate and access capital. To overcome these challenges, innovation facilitators that encourage better exchanges of information and technology knowledge between regulators and innovators can help better balance the risk-and-reward outcomes of FinTech innovation.

<sup>84</sup> Bank Negara Malaysia (2022) Financial Sector Blueprint 2022-2026, <https://www.bnm.gov.my/publications/fsb3>

<sup>85</sup> Bank Indonesia (2019) Indonesia Payment Systems Blueprint 2025, <https://www.bi.go.id/en/publikasi/kajian/Documents/Indonesia-Payment-Systems-Blueprint-2025.pdf>

APEC Webinar on Strategies and Initiatives on Digital Financial Inclusion: Lessons from Experiences of APEC Economies (2022), Day 3 Presentation by Bank Indonesia.

<sup>86</sup> Korea's FinTech policy has progressed in three stages to date, beginning with the Adoption Period from 2013-2015, which culminated in the introduction of a FinTech policy roadmap to foster industry growth. This was followed by a 'Formative Period' between 2015-2017, which saw the government lowering entry barriers to electronic finance businesses and the emergence of FinTech start-ups in diverse fields such as crowdfunding, P2P lending, and robo-advisory services. The third and latest milestone in Korea's FinTech policy journey is the 'Expanding Period' from 2017-2019, which saw major breakthroughs in FinTech legislation, including the Special Act on Internet-only Banks (2018), the FinTech Innovation Support Act (2018), and the Act on P2P lending (2019). See; <https://www.fsc.go.kr/eng/po020101>

<sup>87</sup> For instance, while Canada continues to benefit from basic factors necessary to promote FinTech growth, the economy still has room to build a stronger reputation as a world-class hub for FinTech, with policymaking often playing catchup to consumer behaviour and industry innovation as public and private bodies in Canada push ahead with projects such as digital identity and banking-as-a-service models. See: <https://www.accenture.com/acnmedia/PDF-149/Accenture-FinTech-report-2020.pdf>

One of the most common types of innovation facilitators is the FinTech regulatory sandbox, which is present in most APEC economies. Sandboxes allow regulators and innovators to test and understand the impact of new types of products and services within a controlled environment and with certain regulatory exemptions. Some regulators have even used it to co-test solutions with innovators and shape new regulations. For instance, Singapore’s MAS launched an AI sandbox to validate the use of AI in finance against a set of ethical AI principles it co-developed with leading industry stakeholders to accelerate the adoption of AI in the financial sector.<sup>88</sup>

Another common FinTech facilitator is innovation hubs, which are typically housed under a government agency. These hubs tend to have broader mandates than regulatory sandboxes and can function as a one-stop portal for innovators to readily access regulators to discuss proposed FinTech innovations, gain guidance on navigating regulatory requirements, and potentially seek adjustments to specific regulations they may be subject to.<sup>89</sup> Some, like the Australian Securities and Investments Commission’s (ASIC) Innovation Hub, also host a regulatory sandbox as part of its scope to facilitate FinTech innovation.<sup>90</sup>

### Box 6: Innovation Hubs as an effective approach to building an enabling FinTech ecosystem

In 2015, ASIC launched its Innovation Hub to help FinTech businesses navigate the regulatory environment without compromising on investor and consumer trust and confidence. The Hub provides informal assistance to eligible FinTech businesses by facilitating ASIC licensing for innovative business models and regularly engaging with the FinTech community and a Digital Financial Advisory Panel on key issues at the nexus of finance, technology, and regulation. The Hub also helps eligible companies expand their businesses overseas by providing international referrals to economies with which ASIC has signed international cooperation agreements designed to break down barriers to market entry. Additionally, the Hub houses an Enhanced Regulatory Sandbox that allows eligible businesses to test certain innovative financial services or credit activities without first obtaining the relevant licensing.<sup>91</sup>

This wide range of assistance to FinTech businesses that an innovation hub can provide appears to support the argument that in many cases, innovation hubs can be more effective in developing a conducive ecosystem for FinTech to flourish than other types of innovation facilitators, such as a regulatory sandbox, which is most commonly a tightly defined safe space that grants temporary relief from certain regulatory requirements for select few entities that meet the entry tests. Furthermore, an innovation hub shares many of the same advantages present in a sandbox, such as facilitating pro-innovation dialogues between regulators and businesses or identifying regulatory areas to waive or modify for the purpose of trialling the innovation, etc., without having the challenges sandboxes can pose, such as significant financial contributions and the introduction of new legislation to establish and maintain a sandbox.<sup>92</sup>

In economies where there are no dedicated, government-led innovation hubs, state-owned banks or trade associations have taken the lead to promote FinTech development. For example, in New

<sup>88</sup> Monetary Authority of Singapore (2021) MAS launches global challenge to accelerate innovation in responsible AI solutions, <https://www.mas.gov.sg/news/media-releases/2021/mas-launches-global-challenge-to-accelerate-innovation-in-responsible-ai-solutions>

<sup>89</sup> Buckley et. al (2019) Building FinTech ecosystems: regulatory sandboxes, innovation hubs and beyond, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3455872](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3455872)

<sup>90</sup> ASIC, Enhanced Regulatory Sandbox, <https://asic.gov.au/for-business/innovation-hub/enhanced-regulatory-sandbox/>

<sup>91</sup> ASIC, Innovation Hub, <https://asic.gov.au/for-business/innovation-hub/>

ASIC, International co-operation, <https://asic.gov.au/for-business/innovation-hub/asic-and-FinTech/is-my-FinTech-company-eligible-for-assistance/international-co-operation/>

ASIC, Enhanced Regulatory Sandbox, <https://asic.gov.au/for-business/innovation-hub/enhanced-regulatory-sandbox/>

<sup>92</sup> Buckley et. al, (2019) Building FinTech ecosystems: regulatory sandboxes, innovation hubs and beyond, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3455872](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3455872)

Zealand, the trade association FinTech NZ runs an innovation hub in addition to operating as a collective lobbying apparatus.<sup>93</sup>

### *Government Grants and Government-backed Venture Funds*

Direct government funding in the form of research and innovation grants typically focuses on advancing domestic research and innovation of an emerging technology, rather than for a specific FinTech product or service itself. Some government grants are made available to applicants on a tiered basis. For example, Australia and Singapore have introduced government grant programmes whereby the amount of funding provided is based on a company's historical and/or projected revenue falling within a certain range. There are also economies, such as Japan and Russia, that have introduced tax incentives for emerging technology companies to promote domestic innovation, including in the financial sector.<sup>94</sup> Government grants specific to the FinTech sector are less common; for example, the aforementioned FinTech Solidarity Grant offered by MAS.

Apart from government grants, some economies have also introduced government-backed venture capital (VC) firms to help start-ups access much-needed capital. Similar to government grants, these VC firms typically invest in tech start-ups across a range of industries instead of focusing on a particular sector or service. For example, in Malaysia, Cradle Seed Ventures is the venture capital arm of Cradle Fund Sdn Bhd, a government-backed early-stage investor in technology start-ups. In Singapore, the SG Founder equity scheme allows the government to directly co-invest with third-party investors in a technology start-up or provide funds to a VC firm that will then invest in eligible start-ups through a fund-of-funds approach.<sup>95</sup>

In the Philippines, the government has even introduced an Innovation Startup Act to help relevant agencies and state departments coordinate and monitor types of support for start-ups and start-up enablers, including the implementation of a start-up venture fund and government grant fund.<sup>96</sup>

### *Government-led Cross-border Agreements*

Growth in cross-border trade and growing demand for faster, more convenient, and transparent ways to make payments or transfer money across borders, as well as advancements in digital technologies, have facilitated a number of cross-border initiatives in the FinTech sector. Across APEC, collaboration and cooperation on cross-border FinTech solutions have largely come through formal trade cooperation agreements, bilateral initiatives, and multilateral platforms.

These agreements vary in terms of the level of cooperation and commitment, ranging from broad, high-level cooperation goals, such as information sharing and framework development with several economies, to specific FinTech initiatives like linked payment systems and joint regulatory sandboxes. In some instances, memorandums of understanding or statements of interest have been

<sup>93</sup> FinTechNZ (2022) Looking ahead - FinTech 22/23, <https://FinTechnz.org.nz/2022/05/31/looking-ahead-FinTech-22-23/>

<sup>94</sup> BDO (2020) New "Open Innovation tax incentive", <https://www.bdo.global/en-gb/microsites/tax-newsletters/corporate-tax-news/issue-55-june-2020/japan-new-open-innovation-tax-incentive%E2%80%9D#:~:text=The%20open%20innovation%20tax%20incentive,investment%20in%20a%20venture%20company.> International Comparative Legal Guides (2021) FinTech laws and regulations: Russia 2021-2022, <https://iclg.com/practice-areas/FinTech-laws-and-regulations/russia>

<sup>95</sup> StartupSG (2022) Startup SG Equity, <https://www.startupsg.gov.sg/programmes/4895/startup-sg-equity>

<sup>96</sup> Department of Trade and Industry (2019) Innovation and Startup Act, <https://innovate.dti.gov.ph/resources/laws-and-policies/innovation-and-startup-act/>

used as a light-touch approach to signal an economy's intention to cooperate on a certain topic to foster further developments.<sup>97</sup>

Among APEC economies, financial hubs like Australia; Hong Kong, China; and Singapore have been relatively more proactive on this front and lead in terms of the number of FinTech-specific cooperation agreements signed (36, 15, and 12 respectively). These three economies also account for most of the cooperation agreements signed with other APEC economies. Cooperation agreements on FinTech with non-APEC economies have typically been with leading economies, such as the United Kingdom, Switzerland, and the United Arab Emirates.

Beyond these bilateral initiatives, many APEC economies have also leveraged multilateral platforms to advance FinTech initiatives. Platforms such as the Global Financial Innovation Network (GFIN) and Financial Stability Board (FSB) are among the key avenues for collaboration. Such platforms may be a more effective medium for regional cooperation in identifying regional challenges and harmonising cross-border interoperability. In North and Latin America, FinTech development has commonly been integrated into regional agreements, such as the US-Mexico-Canada Agreement and the agreement among the Pacific Alliance economies of Chile; Mexico; and Peru, through the provision of guiding principles for FinTech collaboration.<sup>98</sup>

### Box 7: Cross-border Tie-Ups on Domestic Payment Systems

To date, cross-border initiatives to link domestic payment systems have gained the most traction. For example, the successful implementation of cross-border payment linkage between Singapore and Thailand<sup>99</sup> led the way in providing a collaboration of linkups between other neighbouring economies, facilitated by the multilateral platform the Association of Southeast Asian Nations (ASEAN).<sup>100</sup> The success and momentum of this initiative fuelled more ambitious projects, such as Project Nexus, which aims to build a network that fully integrates each economy's retail payment systems onto a single cross-border network for instantaneous and secure transfers.<sup>101</sup>

## 2.1.2 Policies to Regulate Established Services

### *Regulating FinTech Activities*

Most APEC economies have introduced laws or regulations that govern a specific FinTech product, service, or technology. The presence of such a regulation tends to reflect the maturity of a particular FinTech activity within the economy. For example, most economies have laws or regulations governing the use of digital payments—a relatively mature FinTech segment. Some economies, like Singapore, have introduced new laws to streamline the existing legislative regime and expand the scope of regulated payment services, while others, like Japan and Korea, have chosen to amend and

<sup>97</sup> Community Futures Trading Commission (n/a) FinTech Cooperation Arrangements, <https://www.cftc.gov/LabCFTC/FinTechCoopArrangements/index.htm>

<sup>98</sup> National Law Review (2020) The United States-Mexico-Canada Agreement – Paving the Way for a Cross-Border FinTech Sandbox, <https://www.natlawreview.com/article/united-states-mexico-canada-agreement-paving-way-cross-border-FinTech-sandbox>; BIS (2020) The dawn of FinTech in Latin America: landscape, prospects and challenges, <https://www.bis.org/publ/bppdf/bispap112.pdf>

<sup>99</sup> Monetary Authority of Singapore (2021) Singapore and Thailand Launch World's First Linkage of Real-time Payment Systems, <https://www.mas.gov.sg/news/media-releases/2021/singapore-and-thailand-launch-worlds-first-linkage-of-real-time-payment-systems>

<sup>100</sup> The Embassy of the Philippines (2021) PH and Singapore Sign FinTech Cooperation Agreement, <https://www.philippine-embassy.org.sg/ph-and-singapore-sign-FinTech-cooperation-agreement/>;

OpenGov (2021) The Philippines Seeks Cross-Border Payment Linkage with Malaysia and Thailand, <https://opengovasia.com/the-philippines-seeks-cross-border-payment-linkage-with-malaysia-and-thailand/>

<sup>101</sup> BIS (2021) Project Nexus: Blueprint for instant cross-border payments moves to testing phase, <https://www.bis.org/about/bisih/topics/fmis/nexus.htm>

update existing payments or electronic fund transfer laws. There are also economies that have chosen to regulate them under existing banking or financial services acts with additional oversight through central bank regulation, such as Malaysia; Indonesia; and China. Other FinTech services that have seen economies introduce new regulations or amendments to existing banking and financial services acts to accommodate the rapidly evolving nature of this sector include e-money/mobile money services, P2P and marketplace lending, and equity crowdfunding.

Certain APEC economies, like Mexico and Chile, have taken a slightly different approach towards regulating FinTech by introducing an overarching FinTech law that combines the various activity-specific regulations into a single document. The overarching law covers both established and novel Fintech services, setting the tone for the latter. For example, Mexico's Law to Regulate Financial Technology Institutions, which was introduced in 2018 and is more commonly referred to as the FinTech Law 2018, sets the stage for FinTech services like open banking, big data analytics, crowdfunding, cryptocurrency, e-money, robo-advisory, and regulatory sandboxes.<sup>102</sup> Likewise, Chile's forthcoming FinTech bill sets the stage for regulating cryptocurrency, P2P lending, digital banks, open banking, and online investment brokers.<sup>103</sup>

The US appears to be the exception to both cases, with FinTech firms not subject to any single federal or state regulator. Instead, depending on the activities, a FinTech company may be subject to oversight from a myriad of financial and state regulators, licensing, and registration requirements.<sup>104</sup>

### *Domestic Interoperability Initiatives*

Domestic interoperability initiatives can help foster FinTech innovation and growth insofar as they can level the playing field between incumbent and new players and set common standards across the industry. Few economies have domestic interoperability as a regulatory requirement. Singapore is a notable example here through its Payment Services Act, which reserves the right for MAS to mandate payment service providers to adopt a common set of standards to ensure interoperability.

Most economies instead chose to adopt 'softer' initiatives that encourage interoperability, such as the introduction of common QR code standards for payments or by allowing non-bank financial institutions access to the domestic FPS. The former is a relatively low-cost initiative to encourage interoperability between bank and non-bank payment services providers, while the latter encourages more usage of the FPS both in terms of transactions and players, which can boost competition and increase choice for consumers.

Member economies in Southeast Asia appear to be at the forefront of such domestic interoperability initiatives. Singapore; Malaysia; Indonesia; Thailand; and the Philippines have introduced common QR code standards in recent years to facilitate domestic payments interoperability between banks

<sup>102</sup> CGAP (2021) Is Mexico's "FinTech law" leading a new trend in FinTech regulation?, <https://www.cgap.org/blog/mexicos-FinTech-law-leading-new-trend-FinTech-regulation>

<sup>103</sup> S&P Global Market Intelligence (2021) Chile's FinTech bill raises expectations for growth in the sector, <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/chile-s-FinTech-bill-raises-expectations-for-growth-in-the-sector-67208860#:~:text=%22The%20law%20expands%20the%20perimeter,a%20license%20to%20conduct%20business.>

<sup>104</sup> ICLG, FinTech laws and regulations – United States, <https://iclg.com/practice-areas/FinTech-laws-and-regulations/usa#:~:text=There%20are%20currently%20no%20U.S.,described%20below%20in%20Section%203>

and non-banks. Except for Thailand, these economies have also allowed non-banks access to the domestic FPS.<sup>105</sup>

Across the rest of APEC, only Mexico and Hong Kong, China have introduced domestic interoperability initiatives similar to the four economies above. Specifically, Hong Kong, China has introduced the HKQR standard for retail payments and allowed non-banks access to the Faster Payment System in 2018.<sup>106</sup> In Mexico, the central bank launched CoDI in 2019, which is a merchant-presented QR code that is directly linked to the FPS. Other economies, such as Australia; Japan; Peru; Chinese Taipei and Viet Nam, have launched common QR code standards or are in the process of doing so, but have either limited their application to banks only (e.g., Viet Nam) or restricted access for non-bank financial institutions to the FPS.<sup>107</sup> Brunei Darussalam is in the process of implementing a digital payment hub, which is expected to launch by Q4 2023. This project will allow the integration of multiple payment systems and instant payments across all local banks. Additionally, the project will introduce a national QR code and other features such as request to pay and fund transfers from e-wallets to bank accounts.

### Box 8: Japan's Domestic Interoperability Initiatives

Japan has seen a shift towards expanding access of non-bank financial institutions to banking services. In 2020, a taskforce was established to explore ways to improve domestic interoperability by allowing non-bank payment service providers to participate in the Zengin System, the payment clearing and communication system used by banks, and the change was put in place in October 2022. Elsewhere, amendments to the Payment Services Act in May 2021 saw the removal of numerical transfer caps placed on fund transfer services by non-bank financial institutions, which could prompt more non-bank entry into traditional banking services.<sup>108</sup>

In China and Korea, the use of QR code payments has been largely driven by large technology companies, such as WeChat and Alipay in China and NaverPay and KakaoPay in Korea. Each of these players operates its own proprietary QR code, and their dominance suggests that the introduction of a common QR code standard may not contribute significantly to promoting domestic interoperability. That said, regulators in both these economies have sought to encourage interoperability through potential non-bank access to domestic FPS.<sup>109</sup> The rest of the APEC member economies, including Canada; Chile; New Zealand; Papua New Guinea; Russia; and the US, have yet to announce or introduce plans for a common QR code standard. Non-bank financial institutions in these markets also have limited or indirect access to the FPS.

## 2.1.3 Policies to Regulate Novel Services

### *Digital Bank Licensing*

Digital banks, at times referred to as Internet-only banks, virtual banks, or neo-banks, replicate to a large extent the service provided by traditional banks, only through virtual channels for distribution.

<sup>105</sup> The Ken (2021) No entry for FinTechs in Thailand's payments revolution, <https://the-ken.com/sea/story/no-entry-for-FinTechs-in-thailands-payments-revolution/>

<sup>106</sup> Hong Kong Monetary Authority (2018) FSP Activation Ceremony, <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2018/09/20180928-3/>

<sup>107</sup> BIS (2021) Developments in retail fast payments and implications for RTGS systems, <https://www.bis.org/cpmi/publ/d201.pdf>

<sup>108</sup> Mondaq (2021) Japan's amended Payment Services Act could prompt more nonbank entries into traditional banking services, <https://www.mondaq.com/fund-management-reits/1068086/japan39s-amended-payment-services-act-could-prompt-more-nonbank-entries-into-traditional-banking-services>

<sup>109</sup> BIS (2021) Developments in retail fast payments and implications for RTGS systems, <https://www.bis.org/cpmi/publ/d201.pdf>

At the same time, they maintain different business models from traditional banks and present new opportunities and risks to the financial sector. Recognising this, most regulators in APEC have taken steps to introduce some form of initiative to better address the specificities around this emerging FinTech sector.

Some economies have chosen to introduce a new licensing category specific to digital banks. Issuances of licenses are limited and closely regulated by the central bank or main financial regulator. Member economies that fall into this category include China; Hong Kong, China; Philippines; Malaysia; Singapore; Chinese Taipei and Thailand.<sup>110</sup> Korea has gone one step further and issued an Internet-only Banking Act in 2018,<sup>111</sup> though the Financial Services Commission (FSC) has only granted Internet-only bank licenses to three companies: KakaoBank, Toss Bank, and K Bank.

Other economies, such as Australia; Canada; Indonesia; Japan; New Zealand; Russia; the US; and Viet Nam, have allowed digital banks to operate under existing bank acts and related regulatory frameworks, with some adjustments.<sup>112</sup> In Australia, a licensing regime has been introduced to allow new entrants, including digital banks, to operate in a restricted phase with limited activity for up to two years until it becomes a fully licensed bank. Similarly, in the US, digital banks often start with an alternative licence, such as e-payments, or e-wallets, before seeking additional licences as they introduce new service offerings.<sup>113</sup> In Indonesia, digital banks are licensed as standard banks with some specific provision in the regulatory framework,<sup>114</sup> while in Viet Nam, digital banks are only allowed to operate as offshoots or in partnership with an existing traditional bank.<sup>115</sup>

There are also some economies where a regulatory framework for digital banks have yet to be introduced but remains under consideration, such as Brunei Darussalam; Papua New Guinea; Peru; and New Zealand. For instance, in Brunei Darussalam, despite the current market size, the Central Bank of Brunei Darussalam (BDCB) has had discussions with several interested parties in establishing a digital bank and welcomes discussions from financial service providers with a strong value proposition. The central bank also has the flexibility to adjust a bank's licensing requirement to introduce new bank activities, including digital banking.

### *Open Banking Frameworks*

Another regulatory initiative that has seen increasing interest is open banking frameworks, which use APIs to make select bank data available to non-bank third parties. Much of the value in open banking is expected to initiate from retail channels, where strategic partnerships can present banks

<sup>110</sup> Thailand is reportedly in the process of issuing its digital banking licensing framework. FinTech News (2022) Thailand seeks to join the digital bank race in Southeast Asia, <https://FinTechnews.sg/58911/virtual-banking/thailand-seeks-to-join-the-digital-bank-race-in-southeast-asia/>

<sup>111</sup> Kim & Chang (2018), Improvements to Regulations on Internet-only Banks, [https://www.kimchang.com/en/insights/detail.kc?sch\\_section=4&idx=18873](https://www.kimchang.com/en/insights/detail.kc?sch_section=4&idx=18873)

<sup>112</sup> Alliance for Financial Inclusion (2021) Policy framework on the regulation, licensing, and supervision of digital banks, [https://www.afi-global.org/wp-content/uploads/2021/11/DFSWG-framework\\_FINAL.pdf](https://www.afi-global.org/wp-content/uploads/2021/11/DFSWG-framework_FINAL.pdf)

<sup>113</sup> Deloitte (2020) Digital banks in Asia Pacific: adding value to financial services? <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/financial-services/deloitte-cn-digital-banks-in-asia-pacific-adding-value-to-financial-services-en-200901.pdf>

Mckinsey (2021) Lessons from the rapidly evolving regulation of digital banking, <https://www.mckinsey.com/industries/financial-services/our-insights/lessons-from-the-rapidly-evolving-regulation-of-digital-banking>

<sup>114</sup> Alliance for Financial Inclusion (2021) Policy framework on the regulation, licensing, and supervision of digital banks, [https://www.afi-global.org/wp-content/uploads/2021/11/DFSWG-framework\\_FINAL.pdf](https://www.afi-global.org/wp-content/uploads/2021/11/DFSWG-framework_FINAL.pdf)

<sup>115</sup> Viet Nam News (202) Experts Consensus: Viet Nam has favorable factors for neobanks to develop, <https://VietNamnews.vn/economy/770391/experts-consensus-viet-nam-has-favourable-factors-for-neobanks-to-develop.html>

and non-bank service providers with opportunities to expand their services, increase sales, and identify new revenue streams.<sup>116</sup>

Just over half of APEC member economies have introduced a framework to encourage the adoption of open banking initiatives. These include Australia; China; Hong Kong, China; Korea; Indonesia; Japan; Malaysia; Mexico; Philippines; Russia; Singapore; and Chinese Taipei, with six other economies— Canada; Chile; New Zealand; Thailand; the US; and Viet Nam<sup>117</sup>—either in the process of introducing one or actively considering doing so. For economies where regulators have yet to introduce an open banking framework, it is likely the case that the FinTech market is still relatively nascent, such as with Brunei Darussalam<sup>118</sup>; Papua New Guinea; and Peru, or that the adoption of open banking applications to date has been largely driven by industry players, such as in the case of China.<sup>119</sup>

### *Central Bank Digital Currency*

Interest in in wholesale and retail CBDC has grown in recent years, with many central banks actively considering its use to advance policy goals. Some hope to use it as a tool to complement financial inclusion efforts, some to enhance settlement efficiency between financial institutions, and others to serve as a safe, convenient payment instrument in jurisdictions where cash is dwindling—or a combination of several or all the above.<sup>120</sup>

Economies such as Australia; Canada; Chile; Indonesia; Japan; Philippines; and Singapore have indicated a preference in exploring the development of wholesale CBDCs, with Australia; Canada; Japan; and Singapore having completed pilot trials and experiments for wholesale CBDCs such as Project Jasper<sup>121</sup>, and Project Dunbar<sup>122</sup>. Other economies, such as Korea; Mexico; and Viet Nam have focused on the development of a retail CBDC. There are also some economies, such as Hong Kong, China; Malaysia; Peru; Thailand; Chinese Taipei; and the US<sup>123</sup> that are exploring options in both retail and wholesale CBDC. For example, the Hong Kong Monetary Authority's Project Aurum is

<sup>116</sup> Accenture (n/a) Open banking, <https://www.accenture.com/us-en/insights/banking/open-banking>

<sup>117</sup> Department of Finance Canada (2022) Government moves forward with open banking and names a lead, <https://www.canada.ca/en/department-finance/news/2022/03/government-moves-forward-with-open-banking-and-names-a-lead.html>  
Open Banking Excellence (2021) The state of open finance in Chile, <https://www.openbankingexcellence.org/blog/the-state-of-open-finance-in-chile/>

Reuters (2022) Thai central bank plans rules on virtual banks, open banking, <https://www.reuters.com/world/asia-pacific/thai-cbanc-plans-rules-virtual-banks-open-banking-2022-03-25/>

FPF.org (2021), The future is open: the US turns to open banking, <https://fpf.org/blog/the-future-is-open-the-u-s-turns-to-open-banking/>

The Paypers (2021) Viet Nam making steps towards open banking, <https://thepaypers.com/online-mobile-banking/Viet-Nam-making-steps-towards-open-banking--1247616>

<sup>118</sup> The central bank of Brunei Darussalam (BDBC) has plans to conduct a feasibility study on open API for financial institutions within the economy, as part of the BDBC's 2021-2025 strategic plan.

<sup>119</sup>The rapid rise of superapps such as AliPay and WeChat Pay, which layered a variety of digital services within its ecosystem, meant that Chinese regulators had little need to take steps to encourage open banking adoption. It is only in the past couple of years that Chinese regulators have stepped in with a massive restructuring of the FinTech industry, which has forced companies like Ant Group to stop renting out their platforms to banks and accept a new host of regulations that require platforms to be regulated as a financial institution if they provide loans, including using their own capital. See: <https://www.digfingroup.com/open-banking-asia-2/>

<sup>120</sup> BIS (2021) BIS Innovation Hub work on central bank digital currency, <https://www.bis.org/about/bisih/topics/cbdc.htm>

BIS (2018) Central bank digital currencies, <https://www.bis.org/cpmi/publ/d174.pdf>

<sup>121</sup> Project Jasper was a collaborative research initiative between the public and private sector to explore how distributed ledger technology could transform the wholesale payments system undertaken by the Bank of Canada, and several private sector stakeholders. See: <https://www.bankofcanada.ca/research/digital-currencies-and-fintech/projects/#Partnerships>

<sup>122</sup> Project Dunbar is an interbank cross-border pilot program between the central banks of Australia; Malaysia; Singapore; South Africa; and the BIS Innovation Hub. See: <https://www.mas.gov.sg/publications/monographs-or-information-paper/2022/project-dunbar>

<sup>123</sup> The New York Federal reserve has participated in pilot trials to enhance cross border payments using wholesale CBDCs. The US federal reserve has issued a research paper on the potential role and functions of retail CBDCs. See: <https://www.newyorkfed.org/newsevents/news/financial-services-and-infrastructure/2022/20221110>; <https://www.federalreserve.gov/econres/feds/retail-cbdc-and-us-monetary-policy-implementation.htm>

a two-tier CBDC prototype carried out in collaboration with the BIS Innovation Hub and the Hong Kong Applied Science and Technology Research Institute which explores the development of a technology stack comprised of a wholesale interbank system and a retail e-wallet system with two different types of tokens.<sup>124</sup> Thailand, a leader in the development of CBDCs, have completed trials in the development of wholesale CBDCs and are now beginning to explore pilot trials to test and study the design and development of a retail CBDC.<sup>125</sup> Other economies, such as Brunei Darussalam and Papua New Guinea are still in the early stages of exploring and monitoring potential use cases for CBDCs.<sup>126</sup>

China is the exception to the above. It is the only APEC economy that has gone beyond exploration and pilot testing to launch a beta version of its digital yuan, also known as the e-CNY. Launched in April 2022 by China's central bank, the People's Bank of China (PBOC), the e-CNY is a digitised version of China's Renminbi and has been designed mainly for use in high-frequency, small-value retail transactions.<sup>127</sup>

### *Crypto-asset Regulations*

At present, many economies underscore that cryptocurrency assets are not considered legal tender while allowing cryptocurrency providers and exchanges to operate within their respective jurisdictions. In economies where cryptocurrency can be bought and sold, current regulatory and legislative actions have required crypto exchanges to register with appropriate governing bodies, like the SEC in the US or MAS in Singapore, and adhere to various banking and securities laws. These governing bodies have also requested or required crypto exchangers and providers to help fight against the use of cryptocurrencies for nefarious purposes and provide regulators with the types of digital currency and assets facilitated by the individual exchange.

With respect to crypto regulatory frameworks, while many economies have chosen to not regulate, some are in the process of determining appropriate legislation. For example, Australia and Canada have more robust regulatory standards for cryptocurrencies, including standards governing what constitutes a cryptocurrency exchange and which financial laws cryptocurrency exchange providers must adhere to.<sup>128</sup> Some economies have announced plans to begin developing cryptocurrency laws and regulations that build upon existing legislation. For example, Japan passed a bill to introduce

<sup>124</sup> BIS (2022) Aurum: a two-tier retail CBDC system, <https://www.bis.org/about/bisih/topics/cbdc/rcbdc.htm>

<sup>125</sup> BOT (2022) BO Press Release No. 58/2022 Findings from multiple central bank digital currency bridge (mBridge) pilot and next steps, <https://www.bot.or.th/English/PressandSpeeches/Press/2022/Pages/n5865.aspx>;

BOT (2022) BOT Press Release No. 39/2022 Progress of Retail Central Bank Digital Currency (Retail CBDC) development, <https://www.bot.or.th/English/PressandSpeeches/Press/2022/Pages/n3965.aspx>

<sup>126</sup> BDCB continues to monitor the development of CBDCs and to build its capacity and readiness in the area, but has no immediate plans to introduce one in the near future considering the high level of financial inclusion and ongoing progress of national digital payment initiatives.

<sup>127</sup> China Briefing (2022) China launches digital yuan: what you need to know, <https://www.china-briefing.com/news/china-launches-digital-yuan-app-what-you-need-to-know/>

Deutsche Bank (2021) Digital yuan: what is it and how does it work? <https://www.db.com/news/detail/20210714-digital-yuan-what-is-it-and-how-does-it-work>

<sup>128</sup> In Australia, cryptocurrency exchanges that exchange fiat currency for cryptocurrency are subject to anti-money laundering and counter-terrorism financing regulation in Australia as issued by AUSTRAC. ASIC also provides guidance regarding obligations for businesses involved with crypto assets under the Corporations Act 2001. See: <https://www.austrac.gov.au/business/industry-specific-guidance/digital-currency-exchange-providers>; <https://asic.gov.au/regulatory-resources/digital-transformation/crypto-assets/> International Comparative Legal Guides (2021) FinTech laws and regulations Canada, 2021-2022, <https://iclg.com/practice-areas/FinTech-laws-and-regulations/canada>

formal regulations<sup>129</sup> on stablecoins,<sup>130</sup> while Mexico is currently studying how to further advance regulation on the subject to protect citizens.<sup>131</sup> In other jurisdictions, cryptocurrency regulations have been promulgated by executive decree, as has been the case in the US; Chinese Taipei; and Thailand. There are also economies that have outright prohibited cryptocurrency exchanges, such as China.<sup>132</sup>

Lastly, an increasing number of economies have begun to institute financial reforms to tax crypto asset exchanges and holdings. Canada and New Zealand, for example, have revised parts of their tax code to include crypto assets, while the existing language of the Philippines' tax code has been interpreted to apply to crypto assets as well. Approaches to taxing crypto assets vary, with Canada treating cryptocurrency as a financial transaction applicable to capital gains taxes whereas New Zealand treats cryptocurrency as a form of property.

## 2.2 Foundational Frameworks

### 2.2.1 Data Governance and Security

#### *Strong Data Privacy and Protection Laws*

Personal data protection legislations recognise the need to safeguard personal data from misuse while allowing organisations to collect, access, and store the data for legitimate and reasonable purposes. When done right, data protection regimes can foster consumer trust in businesses, promote data sharing and innovation, and strengthen an economy's position as a trusted data hub for businesses.

In APEC, almost all member economies have introduced legislation protecting personal data rights. Economies that have not are either in the process of introducing one, such as in the case of Viet Nam; Indonesia; and Brunei Darussalam, or have aspects of it covered under their cybersecurity act, such as in the case of Papua New Guinea. The most effective of these laws typically presents a clear definition of terms and responsibility, straightforward consent and privacy requirements, and well-defined penalties for misbehaviour. The legislation also establishes the authority of the personal data protection commission or agency that is responsible for reviewing and administering the legislation.

Some APEC economies have introduced world-class data privacy regimes that are compliant with global good practices. For example, economies such as Japan; Korea; New Zealand; and Canada have introduced data protection measures adequate to the European Union's (EU) General Data Protection Regulation (GDPR), thereby allowing for personal data to flow freely between these jurisdictions. Others have introduced new legislation or amendments to existing acts that are

<sup>129</sup> Nikkei Asia (2022) Japan adopts law to regulate stablecoins for investor protection, <https://asia.nikkei.com/Spotlight/Cryptocurrencies/Japan-adopts-law-to-regulate-stablecoins-for-investor-protection#:~:text=Under%20the%20new%20law%2C%20which,reinforce%20anti%2Dmoney%20laundering%20measures.>

<sup>130</sup> Stablecoins are a type of cryptocurrency with their value pegged to a legal tender currency

<sup>131</sup> International Comparative Legal Guides (2021) FinTech laws and regulation: Japan, 2021-2022, <https://iclg.com/practice-areas/FinTech-laws-and-regulations/japan>; Banxico (2019) Circular Notice 4/2019 on the operations with virtual assets of credit institutions and financial technology, <https://www.banxico.org.mx/marco-normativo/normativa-emitida-por-el-banco-de-mexico/circular-4-2019/circular-4-2019.html>

<https://cointelegraph.com/news/japan-plans-to-tighten-crypto-exchange-regulation-to-enforce-sanctions>

<sup>132</sup> Markets Insider (2021) Timeline of Beijing's regulatory changes, <https://markets.businessinsider.com/news/currencies/china-crypto-crackdown-timeline-regulatory-bitcoin-ether-solana-dogecoin-bans-2021-9>

influenced by the GDPR but take into consideration local government requirements. For example, Thailand's newly effected Personal Data Protection Act has adopted elements of the GDPR, particularly on issues like data processing, data collection, and data storage, but takes into account local perspectives on consent.<sup>133</sup>

The US is an exception to the trend of introducing a dedicated personal data protection law that is uniformly applied across the whole economy. In the US, individual states enact their own data privacy and protection laws. Applicable federal laws that cover privacy are based on specific data types, such as credit data or health information. Only three states—California, Virginia, and Colorado—have comprehensive personal data protection laws, while at least four other states—Massachusetts, New York, North Carolina, and Pennsylvania—are considering proposals to introduce more comprehensive data protection frameworks.<sup>134</sup> Arguably, this patchwork of federal and state-level data privacy and protection laws in the US does not automatically lend itself to ease of doing business for companies, and it appears that the situation is unlikely to change further due to gridlocks in law-making at the federal level.

### *Robust Data Sharing Frameworks*

Data-sharing frameworks that provide clear data governance and classification standards can remove regulatory ambiguity and enable greater data flows. It can also help set common standards that facilitate interoperability and provide organisations with guidelines on sharing data in a transparent and systematic manner that helps protect the information being shared while allowing for its legal and useful application. This in turn helps foster trust between sharing parties and ensures compliance with local data protection laws.

Most data-sharing frameworks in APEC incorporate a risk or sensitivity assessment to data classification and adopt an equivalency or mutual recognition approach to standards for data protection. Some economies have developed data-sharing frameworks to help businesses navigate the complexity of the matter. Singapore, for example, developed the Trusted Data Sharing Framework to help businesses overcome challenges in addressing trust between data providers and to develop 'trusted data'.<sup>135</sup> Others have regulated sharing of government data through legislation. In Australia, parliament recently passed the *Data Availability and Transparency Act 2022*, which establishes a legislative scheme for sharing Australian Government data. The Act provides a framework for safe and fit-for-purpose data sharing by permitting Commonwealth government agencies to share data with accredited users for one or more of three data sharing purposes: delivery of government services, informing government policy and programme, and research and development. Only Australian entities can be accredited to participate in the scheme.<sup>136</sup>

A critical development in cross-border data sharing over the past two decades has been the implementation of APEC's Cross-Border Privacy Rules (CBPR) System. CBPR system is a government-backed, accountability-based mechanism that facilitates privacy-respecting data flows and allows

<sup>133</sup> US International Trade Administration (2022) Thailand Personal Data Protection Act, <https://www.trade.gov/market-intelligence/thailand-personal-data-protection-act#:~:text=Thailand's%20first%20consolidated%20law%20to,the%20enforcement%20begin%20in%202022>

<sup>134</sup> New York Times (2021) The state of consumer data privacy laws in the US, <https://www.nytimes.com/wirecutter/blog/state-of-privacy-laws-in-us/>

<sup>135</sup> IMDA (2019) Trusted Data Sharing Framework, <https://www.imda.gov.sg/-/media/Imda/Files/Programme/AI-Data-Innovation/Trusted-Data-Sharing-Framework.pdf>

<sup>136</sup> Australian entities are limited to the Commonwealth, State and Territory bodies, and Australian universities. See: <https://www.legislation.gov.au/Details/C2022A00011>

governments to certify businesses that adhere to a set of data privacy policies consistent with the APEC privacy framework. Currently, Australia; Canada; Korea; Japan; Mexico; Philippines; Singapore; Chinese Taipei; and the US are participating in the certification system.<sup>137</sup>

Another critical development in data sharing is the introduction of data localisation requirements by member economies. Requirements are typically sector-specific and present in the local data protection or cybersecurity laws. APEC economies that have introduced or plan to introduce data localisation requirements on financial information, such as banking, credit, or tax records, are Australia; Chile; China; Indonesia; Korea; Mexico; New Zealand; Chinese Taipei; and Viet Nam.<sup>138</sup>

### *Robust Cybersecurity Measures*

Robust and up-to-date cybercrime and cybersecurity measures are critical for safeguarding users and providers in the digital economy. They provide clarity on data security procedures, protect critical information infrastructures, define what constitutes illicit activity in cyberspace, and stipulate legal processes to enforce and investigate online crime, abuse, and other illegal actions.

APEC economies have taken varying approaches towards governing cybersecurity and crime. Some economies, like Singapore, have introduced comprehensive cybersecurity laws that outline measures to prevent, manage, and respond to cybersecurity threats and incidents, as well as to identify and regulate owners of critical information infrastructure (CII).<sup>139</sup> Other economies govern cybersecurity obligations under several legislations. For example, in Australia, applicable laws include the Criminal Code Act, the Privacy Act, the Crimes Act, the Security of Critical Infrastructure Act, and the Telecommunications (Interception and Access) Act, in addition to state-level privacy acts and criminal codes.<sup>140</sup> There are also economies that have passed legislation to further strengthen cybersecurity and the protection of CII. For example, the US Congress passed the Strengthening American Cybersecurity Act in March 2022, which paid particular attention to security incident reporting requirements for entities in critical infrastructure sectors. In Indonesia, President Joko Widodo signed into effect Presidential Regulation No. 82 of 2022 on Vital Information Infrastructure to prevent the misuse of electronic information and transactions that can cause public disturbances.<sup>141</sup>

Effective cybersecurity regimes typically have dedicated agencies to oversee the implementation, revision, and coordination of cyber policies, with some economies maintaining more than one agency responsible for providing guidance on cybersecurity measures. For example, in Canada, the Communications Securities Establishment is the technical authority for cybersecurity and information assurance and operates the Canadian Centre for Cyber Security (CCCS) as part of its

<sup>137</sup> About CBPRS (2022) CBPRS, <http://cbprs.org/about-cbprs/>

<sup>138</sup> Baker Mckenzie (2022) Global data privacy and security handbook – Australia,

<https://resourcehub.bakermckenzie.com/en/resources/data-privacy-security/asia-pacific/australia/topics/data-localizationresidency>

Baker Mckenzie (2020) global data privacy and security handbook - Canada, <https://resourcehub.bakermckenzie.com/en/resources/data-privacy-security/north-america/canada/topics/data-localizationresidency>

Baker Mckenzie (2020) Global data privacy and security handbook – Chile, <https://resourcehub.bakermckenzie.com/en/resources/data-privacy-security/latin-america/chile/topics/data-localizationresidency>

Baker Mckenzie (2022) Global data privacy and security handbook – Indonesia,

<https://resourcehub.bakermckenzie.com/en/resources/data-privacy-security/asia-pacific/indonesia/topics/data-localizationresidency>

ITIF (2021) How barriers to cross-border data flows are spreading globally, what they cost, and how to address them, <https://itif.org/publications/2021/07/19/how-barriers-cross-border-data-flows-are-spreading-globally-what-they-cost/>

<sup>139</sup> Singapore Cybersecurity Act (2018), <https://sso.agc.gov.sg/Acts-Supp/9-2018/>

<sup>140</sup> ICLG (2022) Cybersecurity laws and regulations Australia, <https://iclg.com/practice-areas/cybersecurity-laws-and-regulations/australia>

<sup>141</sup> Government Regulation No. 82 of 2022 on Protection for Vital Information Infrastructure, <https://setkab.go.id/en/president-jokowi-issues-presidential-regulation-on-protection-for-vital-information-infrastructure/>

mandate. The latter is responsible for issuing alerts and advisories on potential, imminent, or actual cyber threats, incidents, or vulnerabilities that affect the economy's critical infrastructures. Cybersecurity provisions for a critical infrastructure sector have also been used to strengthen the resilience of the sector. In addition to the CCCS, financial regulators like the Office of the Superintendent of Financial Institutions, the Canadian Securities Administrator, the Investment Industry Regulatory Organisation of Canada, and the Mutual Fund Dealers Association of Canada, are also expected to monitor, detect, report, prevent, and mitigate cyber incidents involving their respective members.<sup>142</sup>

In some economies, common cybersecurity standards are used to strengthen the resilience of the critical infrastructure sector. In Australia, the Prudential Standard CPS 234 Information Security issued by the Australian Prudential Regulation Authority (APRA) sets out common information security standards to ensure that APRA-regulated entities take measures to be resilient against information security incidents, including cyber-attacks, by maintaining an information security capability commensurate with information security vulnerabilities and threats.<sup>143</sup>

## 2.2.2 Consumer Protection and Market Competition

### *Anti-Money Laundering/Counter-Terrorism Financing*

The risks posed by money laundering and financing terrorism are major concerns for an economy's financial system and the security of its citizens. A common approach adopted by most APEC economies is the Risk-Based Approach (RBA) to AML/CTF by the intergovernmental Financial Action Task Force (FATF), which expects regulators and financial institutions to identify, assess, and understand ML/TF risks and take measures commensurate to the risks posed, while also mitigating them effectively. A variation to the RBA is a tiered customer-due-diligence approach, with Mexico as a notable example. See the box below for further details.

#### **Box 9: Mexico's Tiered Approach to Account Opening**

In 2011, Mexico approved a tiered scheme for opening deposit accounts at credit institutions. The scheme has four 'tiers' to provide some flexibility on account opening, particularly for low-value, low-risk accounts. The level of scrutiny and monitoring increases progressively with higher transaction values. Notably, the scheme introduced a 'Level 1' account that was exempt from identity verification requirements on the basis that these accounts were of low value and low risk. Although the identities of account holders were not verified, transactions from these accounts were monitored for suspicious activity.<sup>144</sup>

Effective AML/CTF rules and frameworks also need to continuously adapt to evolving risks posed by technological innovation, the increased integration of global financial flows, the ingenuity of criminals to exploit gaps and loopholes in systems, and the global nature of terrorist organisations.

<sup>142</sup> ICLG (2022) Cybersecurity laws and regulations Canada, [https://iclg.com/practice-areas/cybersecurity-laws-and-regulations/canada#:~:text=Under%20Section%20430\(1.1\)%20of,offence%20is%2010%20years'%20imprisonment](https://iclg.com/practice-areas/cybersecurity-laws-and-regulations/canada#:~:text=Under%20Section%20430(1.1)%20of,offence%20is%2010%20years'%20imprisonment)

<sup>143</sup> Australia Prudential Regulation Authority (2019) Prudential Standard CPS 234 Information Security, [https://www.apra.gov.au/sites/default/files/cps\\_234\\_july\\_2019\\_for\\_public\\_release.pdf](https://www.apra.gov.au/sites/default/files/cps_234_july_2019_for_public_release.pdf)

<sup>144</sup> CGAP (2013) Mexico's tiered KYC: an update on market response, <https://www.cgap.org/blog/mexicos-tiered-kyc-update-market-response/>

CGAP (2011) A bold move toward simplifying AML/CTF: lessons from Mexico, <https://www.cgap.org/blog/bold-move-toward-simplifying-amlcft-lessons-mexico>

CGDEV (2021) A decision tree for digital payment services: The case of Mexico, <https://www.cgdev.org/sites/default/files/Mexico-Decision-Tree.pdf>

To this end, APEC economies have responded by introducing new measures or expanding the scope of existing AML/CTF regulations. For example, Australia; Singapore; and Japan are examples of economies that have introduced AML/CTF regulation of businesses that provide services related to crypto-assets. This regulation includes requirements for risk-based measures to detect and disrupt financial crime, such as transaction monitoring irrespective of the transaction value.<sup>145</sup> Some economies have also expanded regulations to cover emerging FinTech-specific services, such as e-money/digital wallets and crowdfunding platforms.<sup>146</sup> For example, in 2022, Canada updated its AML/CTF regulation to introduce regulations covering crowdfunding platforms and specific payment providers of electronic fund transfers.<sup>147</sup>

### *Financial Consumer Protection*

A well-functioning financial system requires a high degree of consumer trust. Unfair business practices in financial products and services, including false advertising, misleading representation, deceptive pricing, and non-compliance regarding standards and obligations, are among the risks that can jeopardise consumer trust. It is therefore important for economies to have robust consumer protections in place to safeguard against these risks.

All APEC economies have adopted some form of consumer protection regulation. Financial consumer protection regulations are commonly introduced as a part of an economy-wide, sector-agnostic consumer protection law (e.g., Chile's Consumer Protection Law (Law No. 19,496)) or regulations integrated into laws governing financial services (e.g., Japan's Payment Services Act (Act No. 59 of 2009), the Banking Act (Act No. 59 of 1981)). While the integrated regulations are adequate foundations, many economies have introduced standalone policies and laws targeted at financial consumer protection. Chinese Taipei;<sup>148</sup> Korea;<sup>149</sup> and the Philippines<sup>150</sup> have adopted these standalone regulations as they offer the authorities more direct oversight to revise or expand the existing scope of regulations in response to the rapid growth of financial products and services offerings.

In APEC member economies, the authority in charge of financial consumer protection differs. The responsibility commonly falls under the mandate of central banks or a designated consumer financial authority. However, this difference does not seem to lead to any discernible differences in the type of policies and enforcement adopted. Nonetheless, as financial products and services become more prevalent, independent consumer financial authorities may be better equipped to

<sup>145</sup> AUSTRAC (2022) Digital currency exchange providers, <https://www.austrac.gov.au/business/industry-specific-guidance/digital-currency-exchange-providers>; MAS (2022) Prevention of Money Laundering and Countering the Financing of Terrorism, <https://www.mas.gov.sg/-/media/MAS-Media-Library/regulation/notices/AML/notice-626/MAS-Notice-626-Amendment-2022-1.pdf?la=en&hash=44F67AC60C70B29913976226FE908AC6E626EB08>;

ICLG (2022) Anti-Money Laundering Laws and Regulations – Japan, <https://iclg.com/practice-areas/anti-money-laundering-laws-and-regulations/japan>

<sup>146</sup> Gowling WLG (2022) Payment Services and Crowdfunding Services Are Now Regulated Under Canada's Anti-Money Laundering Framework, <https://gowlingwlg.com/en/insights-resources/articles/2022/canada-anti-money-laundering-framework-regulation/>; The Register (2022) Japan lets its banks and other entities issue stablecoins, [https://www.theregister.com/2022/06/06/japan\\_regulates\\_stablecoin/](https://www.theregister.com/2022/06/06/japan_regulates_stablecoin/)

<sup>147</sup> ZDNet (2022) Canada includes crypto and crowdfunding under laundering and terrorism financing laws, <https://www.zdnet.com/article/canada-expands-terrorism-financing-laws-to-include-crypto-and-crowdfunding/>

<sup>148</sup> Laws & Regulations Database of The Republic of China (Taipei) (n/a) Financial Consumer Protection Act, <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=G0380226>

<sup>149</sup> Financial Services Commission (n/a) Financial Consumer Protection Act, <https://www.fsc.go.kr/eng/po070101>

<sup>150</sup> BIS (2022) Proposed Financial Consumer Protection Act, <https://www.bis.org/review/r220121b.htm#:~:text=The%20enactment%20of%20the%20FCP,centric%20standards%20of%20business%20conduct.>

respond to the innovation and challenges of FinTech and could implement more accessible and efficient recourse mechanisms.

Recognising the need to bolster consumer protection in line with innovation in financial sectors, economies have moved swiftly to introduce new consumer protection regulations. China, for example, has introduced new rules and pursued ongoing discussions on ways to make clear the responsibility of FSPs offering robo-advisory services, as well as the role of digital platforms that are expanding their business offerings into the financial sector.<sup>151</sup> Similarly, Singapore has also highlighted the need to strike a balance between fostering the growth of crypto-related services and safeguarding consumer interest through measured enforcement, such as the ban on cryptocurrency service providers advertising to the general public.<sup>152</sup>

### *Competitive Business Environment*

A business environment with clear and easy-to-navigate regulations can promote competition and spur innovation. Given the abundance of opportunities in FinTech, business-friendly economies are likely to attract more private enterprises and skilled talent that contributes to the sector. This is in line with the APEC Services Competitiveness Roadmap (2016-2025) and the need to facilitate effective financial markets.<sup>153</sup>

Strong intellectual property (IP) protection is usually an indicator of an economy's emphasis on fostering innovation and research and development. Based on the World Economic Forum's IP Protection ranking under the Global Competitiveness Report, IP protection law varies widely across APEC member economies.<sup>154</sup> This indicates that there is still room for economies to put in place more enabling policies to foster FinTech growth and to leverage good practices or cooperation with the world's five major IP offices.<sup>155</sup>

Even with strong IP protection, economies may still regard the financial sector as a 'strategic' or 'critical' sector that requires stricter regulation, which can limit market entry and the competitiveness of the FinTech industry's business environment. Singapore, for example, while ranking high on IP protection and being well-regarded as an open economy with low barriers of entry, continues to maintain a high degree of control over retail banking services.<sup>156</sup> Similarly, Thailand maintains restrictions over foreign ownership of certain services such as banking and insurance, among other priority services of concern.<sup>157</sup> In contrast, Hong Kong, China does not place any distinction on investments and operations between foreign and domestic firms.<sup>158</sup>

<sup>151</sup> PBOC (2020) Implementation Measures of the People's Bank of China for Financial Consumer Protection, <http://www.pbc.gov.cn/en/3688253/3689009/3788480/4121916/2020110615170136365.pdf>; PBC (2021) The Protection of Consumer Financial Data for Large Internet Platforms, <http://www.pbc.gov.cn/en/3935690/3935759/4514403/2022032311560933222.pdf>

<sup>152</sup> MAS (2022) MAS Issues Guidelines to Discourage Cryptocurrency Trading by General Public, <https://www.mas.gov.sg/news/media-releases/2022/mas-issues-guidelines-to-discourage-cryptocurrency-trading-by-general-public>

<sup>153</sup> APEC (2015) APEC Services Competitiveness Roadmap (2016 – 2025) Implementation Plan, <http://australianservicesroundtable.com.au/wp-content/uploads/2018/04/ASCR-Implementation-Plan.pdf>

<sup>154</sup> WEF (2020) Global Competitiveness Report Special Edition 2020: Performing on the Road to Recovery, <https://www.weforum.org/reports/the-global-competitiveness-report-2020/>

<sup>155</sup> Five major IP offices includes the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), and the United States Patent and Trademark Office (USPTO).

<sup>156</sup> US Department of State (2020) 2020 Investment Climate Statements: Singapore, <https://www.state.gov/reports/2020-investment-climate-statements/singapore/>

<sup>157</sup> US Department of State (2020) 2020 Investment Climate Statements: Thailand, <https://www.state.gov/reports/2020-investment-climate-statements/thailand/>

<sup>158</sup> US Department of State (2020) 2020 Investment Climate Statements: Hong Kong, <https://www.state.gov/reports/2020-investment-climate-statements/hong-kong/>

Nevertheless, the general trend shows that almost all APEC members are easing restrictions on foreign investment in the financial sector. Examples of this include China allowing full foreign ownership of securities and mutual fund firms since 2020 and Indonesia's reform of the payments market to allow foreign investors to control 85% instead of only 49% of economic interests in payment service providers.<sup>159</sup> These developments are expected to continue accelerating in line with the expansion of initiatives such as digital banking licences and regulatory sandboxes, as discussed in the section above.

### *Digital Upskilling Programmes*

In the face of a digital skills shortage, APEC member economies have introduced a range of digital upskilling programmes to foster the growth of domestic high-tech sectors. Most economies sponsor holistic digital upskilling programmes that cover a range of topics instead of focusing on just one sector, such as FinTech. An example is New Zealand's Digital Boost, a free government-funded initiative to help small businesses adapt to the increasingly digital world by learning new digital skills or adopting digital tools such as cloud-based accounting systems. Some training programmes tend to utilise public-private partnership (P3) models with local technology firms and/or universities. For example, Australia's digital skills organisation is funded by the Department of Education, Skills, and Employment and works closely with employers, trainers, and employees to grow a digitally skilled workforce.<sup>160</sup> The P3 model benefits member economies' abilities to forecast labour supply and have a robust pool of candidates capable of meeting industry needs. The partnerships also provide citizens with opportunities for economic mobility by providing roadmaps for them to access higher-paying jobs.

Member economies that do maintain specific upskilling programmes in FinTech include Chinese Taipei; Hong Kong, China; Korea; and Indonesia. Like the holistic digital upskilling programmes, each economy leverages a P3 model with post-secondary institutions under the umbrella of their respective domestic digital plans. For example, Chinese Taipei's FinTech Development Roadmap<sup>161</sup> facilitates several training programmes seeking to upskill the workforce on FinTech concepts as well as rolls out the FinTech Proficiency Certification Mechanism, which adopts a two-stage certification, including basic skills and professional skills. The training and the certification mechanism are overseen by the TABF, a non-profit organisation advised by Chinese Taipei's FSC.<sup>162</sup> This model allows member economies to take advantage of continuing education programmes run by local universities or FinTech labs. For example, the Seoul FinTech Lab, funded by the Seoul metropolitan government, offers customised training courses on FinTech through its Fin-Academy.<sup>163</sup>

## 2.2.3 Digital Native Initiatives

### *E-KYC Frameworks*

Digitising customer identification and verification, or e-KYC, is an important enabler for the adoption of digital financial services. It allows for end-to-end delivery of financial services through online or

<sup>159</sup> Asian Banking and Finance (2021) Indonesia upturns payments market with new foreign-friendly rules, <https://asianbankingandfinance.net/cards-payments/in-focus/indonesia-upturns-payments-market-new-foreign-friendly-rules>; Washington Post (2021) China's Finance World Opens Up to Foreigners, Sort Of, [https://www.washingtonpost.com/business/chinas-finance-world-opens-up-to-foreigners-sort-of/2021/11/04/bda982aa-3d31-11ec-bd6f-da376f47304e\\_story.html](https://www.washingtonpost.com/business/chinas-finance-world-opens-up-to-foreigners-sort-of/2021/11/04/bda982aa-3d31-11ec-bd6f-da376f47304e_story.html)

<sup>160</sup> Digital Skills Organisation (n/a), <https://digitalskillsorg.com.au/about/>

<sup>161</sup> FinTech Development Roadmap <https://www.fsc.gov.tw/en/home.jsp?id=486&parentpath=0,4,175>

<sup>162</sup> TABF, "A Financial Instruction and Practitioner Training Hub." <https://www.tabf.org.tw/English/En-training.aspx>

<sup>163</sup> Seoul FinTech Lab, <https://seoulFinTechlab.kr/en/programs/>

mobile channels, improves the convenience and reach of the service, and lowers the costs and burden of conducting paper-based administrative tasks for users and service providers.

Within APEC, Korea has been a pioneer in e-KYC initiatives, with the FSC allowing alternative non-face-to-face identification methods since 2015 when opening a new account. This not only helped increase the adoption of digital banks but also facilitated the introduction of Korea's Internet-Only Bank Act in 2018. Other economies in Asia followed suit, with Japan; Hong Kong, China; and China introducing amendments to their banking acts and AML regulations circa 2018 that allowed for more flexibility on the use of electronic methods for non-face-to-face identification during the customer verification process.<sup>164</sup>

In Southeast Asia, the push for e-KYC frameworks appears to be closely tied to the implementation of domestic digital identities. Brunei Darussalam; Malaysia; Philippines; Singapore; and Thailand have introduced regulations or policy frameworks that allow the use of e-KYC methods when opening an account in a bid to boost the adoption of digital financial services and digital identities for financial inclusion, while Viet Nam and Indonesia are still in the process of exploring its potential.<sup>165</sup>

E-KYC frameworks appear to be less prevalent outside the Asia Pacific region, with Peru the only economy that has allowed for account openings to be 'purely electronic' in a bid to advance financial inclusion efforts.<sup>166</sup>

### *Domestic Digital Identity Initiatives*

Government-issued digital IDs can be a critical enabler for the growth and development of the digital economy. They can help accelerate the digital transformation of industries, contribute to data portability and data rights protection, and unlock long-term economic value by enabling more inclusive access to financial services, education, and healthcare, among others.

Almost all APEC economies have introduced, or are in the process of introducing, a domestic digital ID law or policy framework. Only a few economies, such as Canada; New Zealand; the US; and Papua New Guinea, are still at the stage of exploring potential use cases and implementation frameworks. This may be due to the nature of policymaking in the economy or a general lack of momentum for government-issued digital IDs.

Most economies that have a domestic digital ID law or framework have implemented it as part of their digital transformation strategy. Economies like Chile; Hong Kong, China; and Singapore have built digital IDs based on open standards to encourage interoperability, allow both the public and private sectors to develop value-added services, and encourage interoperability. Other economies, like Australia; Brunei Darussalam; Japan; and Thailand, have introduced government-issued digital IDs with uses limited to accessing key government services or services in specific sectors like

<sup>164</sup> ADB (2022) FinTech policy toolkit for regulators and policymakers in Asia and the Pacific,

<https://www.adb.org/sites/default/files/publication/780806/FinTech-policy-tool-kit-regulators-policy-makers.pdf>

<sup>165</sup> MAS (n/a) Digital ID and e-KYC, <https://www.mas.gov.sg/development/FinTech/technologies---digital-id-and-e-kyc>

BNM (2020) BNM/RH/PD 030-10 Electronic Know-Your-Customer, <https://www.bnm.gov.my/documents/20124/948107/e-KYC+Policy+Document+300620.pdf/af752210-02e5-d2a4-e2ee-04b00c731a91?t=1594085248675>

ADB (2022) FinTech policy toolkit for regulators and policymakers in Asia and the Pacific,

<https://www.adb.org/sites/default/files/publication/780806/FinTech-policy-tool-kit-regulators-policy-makers.pdf>

<sup>166</sup> CGDEV (2019) Identifying and verifying customers: when are KYC requirements likely to become constraints on financial inclusion?

<https://www.cgdev.org/sites/default/files/identifying-and-verifying-customers-when-are-kyc-requirements-likely-become-constraints.pdf>

healthcare and finance.<sup>167</sup> In Korea, the initiative is decentralised and largely driven by the industry with support from some government ministries.<sup>168</sup> Additionally, as mentioned above, for several APEC economies, the implementation of a domestic digital ID framework is viewed as a foundational step for the use and promotion of e-KYC services given its ability to provide verified and authenticated proof of identity.

### *Guidelines on Artificial Intelligence in the Financial Sector*

The application of AI in the financial sector has expanded significantly in recent years. Advances in computing power and the availability of enormous quantities of data have led to major breakthroughs in the field. A growing number of businesses and governments are relying on AI to enhance their operations and decision-making facilities in a wide range of use cases, from improving algorithmic trading and detecting fraudulent transactions to making smarter credit underwriting and developing more accurate predictive analytic models for better risk management.

To this end, some APEC member economies with thriving banking and financial sectors, such as China; Hong Kong, China; Korea; Singapore; and the US, have introduced guidelines on the use of AI specifically for the financial sector. While not enforceable, these guidelines set the industry tone for the development and use of fair and responsible AI in financial products and services. Refer to Box 10 below for examples.

Many of the remaining APEC economies have introduced domestic AI strategies that cover different sectors of the economy, including the labour market, health, education, science, and technology. Some economies, like Malaysia and New Zealand, are still in the process of exploring use cases and potential initiatives.<sup>169</sup>

#### **Box 10: Examples of Artificial Intelligence Guidelines for the Financial Sector**

The following economies have introduced industry-wide guidelines to encourage the use and adoption of responsible and ethical AI in the financial sector:

- In **China**, the PBOC and other financial regulators have jointly issued a set of requirements and human-intervention obligations for financial institutions using AI in asset management. China is also in the process of formulating a domestic plan to establish a comprehensive legal regime to govern the use of AI in the financial sector and other industries by 2025.<sup>170</sup>
- In **Hong Kong, China**, HKMA has issued two circulars on the use of AI: one that broadly covers key aspects of responsible and fair AI in relation to consumer protection, and one more specifically on the use of AI in retail banking.<sup>171</sup>

<sup>167</sup> Japan's ongoing plans to digitise its National ID will expand government services to residents and citizens and be fully accepted by all medical facilities by March 2023. Thailand's NDI is operated by the National Digital ID Co Ltd and was established by the government with the first phase focused on providing services to facilitate bank account opening and online credit application, before expanding its use case to other public and private sector services. See: <https://www.securitymagazine.com/articles/96435-japan-introduces-facial-recognition-to-unified-id-system>; <https://www.ndid.co.th/about/>

<sup>168</sup> TechWire Asia (2021) Korea's decentralized identity approach to ID, <https://techwireasia.com/2021/06/koreas-decentralized-identity-approach-to-identity-management/>; Identity Review (2020), South Korea leading new standards for decentralized ID, <https://identityreview.com/south-korea-leading-new-standards-for-decentralized-id/>

<sup>169</sup> OECD.AI (n/a) National AI policies and strategies, <https://oecd.ai/en/dashboards>

<sup>170</sup> Global Legal Insights (2022) China: AI Machine learning and big data laws and regulation <https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/china>

<sup>171</sup> HKMA (2019) Artificial intelligence in retail banking, <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191101e1.pdf>

HKMA (2019) High-level principles on artificial intelligence, [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Artificial Intelligence \(AI\) in Retail Banking.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Artificial%20Intelligence%20(AI)%20in%20Retail%20Banking.pdf)

- In **Korea**, draft amendments to the EFTA have suggested regulating business activities that use AI and big data to prevent misunderstandings and algorithm biases, as well as to ensure that users can make their own decisions freely.<sup>172</sup>
- In **Singapore**, MAS has worked closely with industry leaders to develop assessment methodologies for each of its FEAT principles<sup>173</sup> and is now at the stage of testing its applicability with select participants from the financial and technology sectors.
- In the **US**, while no AI-specific federal legislation has been enacted to date, the Federal Trade Commission has signalled its intention to address the issue and has published two blog posts to provide businesses with guidance on how to ensure that their use of AI does not violate FTC acts prohibiting unfair or deceptive business practices, such as the Fair Credit Reporting Act and the Equal Credit Opportunity Act.<sup>174</sup>
- In **Viet Nam**, while there are no specific initiatives on AI for the financial sector to date, the domestic AI strategy identifies key ministries, including the ministry of finance, with the responsibility to promote the development and application of AI within their respective industry portfolios.<sup>175</sup>

<sup>172</sup> Thomson Reuters Practical Law (2021) FinTech in South Korea: Overview, [https://uk.practicallaw.thomsonreuters.com/w-030-8035?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/w-030-8035?transitionType=Default&contextData=(sc.Default)&firstPage=true)

<sup>173</sup> The FEAT principles refer to a set of principles that were introduced by MAS to promote fairness, ethics, accountability, and transparency in the use of AI and data analytics in finance. See: <https://www.mas.gov.sg/news/media-releases/2018/mas-introduces-new-feat-principles-to-promote-responsible-use-of-ai-and-data-analytics>

<sup>174</sup> OECD (2021) AI in business and finance, <https://www.oecd-ilibrary.org/sites/ba682899-en/1/3/1/index.html?itemId=/content/publication/ba682899-en&csp=02d27ef0d7308d76a010fd2a9882228f&itemIGO=oecd&itemContentType=book>

<sup>175</sup> BaoChinhPhu (2021) National Strategy on R&D and application of artificial intelligence, <https://en.baochinhphu.vn/national-strategy-on-rd-and-application-of-artificial-intelligence-11140663.htm#:~:text=To%20promote%20research%2C%20development%20and,ASEAN%20and%20over%20the%20world.>

### 3. Sizing APEC's FinTech Opportunity

Section 3 sets out the various innovations present in APEC's FinTech landscape, while Section 4 highlights the importance of having strong foundational frameworks and conducive policy environments specific to FinTech to unlock the full benefits of FinTech technologies. The objective of this section is to assess the current state of FinTech activity in APEC member economies and explore any links between the strength of an economy's policy environment, the amount of FinTech activity, and its progress towards achieving socio-economic development outcomes.

This section first estimates the number of digital transactions and the average value of each digital transaction in APEC economies in 2021 to understand the amount of FinTech-related activity in each APEC economy. The **analysis revealed that 373.8 billion digital transactions were performed in 2021 across 18 APEC economies, with digital transactions forming 23% of all transactions.** The average value of each digital transaction is estimated at USD10.20. Despite the large number of digital transactions in APEC economies, most of the transactions conducted are small-value transactions. An increased number of digital transactions in an economy is correlated with reduced transaction value. These findings highlight the role played by legacy systems in impacting the use of digital transactions and the absence of a one-size-fits-all policy across APEC economies in encouraging the adoption of digital payment systems.

In addition, the relationship between the proportion of digital transactions and the share of cross-border digital trade in each economy was also examined. While a positive correlation between the proportion of digital transactions in APEC economies and the share of their exports that are digitally enabled was observed, this correlation was relatively weak. This suggests that FinTech's potential impact on digital trade has not yet been fully realised and highlights the need for stronger cross-border collaboration amongst APEC economies to reap the benefits of digital trade.

Finally, this section explores any statistical relations between the policy environments of the APEC economies, the proportion of digital transactions, and economic growth through regression analysis. The analysis found that strong foundational frameworks and an enabling policy environment for FinTech, as discussed in earlier sections, are correlated with a higher number of digital transactions and economic growth. This strengthens the case for governments to focus on building policy environments conducive for FinTech to thrive. This section also briefly discusses the role that FinTech can play in strengthening financial inclusion.

#### 3.1 Digital Transactions in APEC

##### 3.1.1 Estimating Number and Average Value of Digital Transactions

Asia-Pacific is at the forefront of driving new business models and innovations in cashless payments. Estimates from PwC state that global cashless payment volumes (i.e., number of transactions) are expected to increase by more than 80% from 2020 to 2025 and to almost triple by 2030, with the most rapid growth set to occur in the Asia Pacific region.<sup>176</sup> In Asia Pacific, cashless transaction volume is expected to more than double between 2020 and 2025 through the emergence of a range

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<sup>176</sup> PwC (2021), "Navigating the Payments Matrix: Charting a Course Amid Evolution and Revolution." Available at: <https://www.pwc.com/gx/en/financial-services/fs-2025/pwc-future-of-payments.pdf>

of ‘super apps’, such as Grab (Singapore), Kakao (Republic of Korea), WeChat (China), Alipay (China), and Gojek (Indonesia).<sup>177</sup>

To estimate the number of digital transactions in each economy, this research defines digital transactions as paperless transactions excluding card transactions.<sup>178</sup> It relies on economy-level data collected by member economies and data on trade volumes within APEC member economies. The detailed methodology is recorded in Appendix II. Based on our estimates, 373.8 billion digital transactions were performed in 2021 across the 18 APEC economies for which data was available, with digital transactions forming 23% of all transactions.<sup>179</sup> The average value of digital transactions across the 18 economies is USD10.20. The breakdown for each economy is provided in Table 1.

**Table 1: Number and Average Value of Digital Transactions**  
(paperless transactions less card transactions)

Economy	Number of digital transactions as a percentage of all transactions	Average value of digital transaction (in USD)
Australia	19%	15.0
Canada	43%	9.6
Chile	43%	3.5
People’s Republic of China	33%	9.4
Indonesia	4%	4.3
Japan	26%	25.1
Republic of Korea	46%	8.5
Malaysia	8%	7.0
Mexico	4%	26.2
New Zealand	22%	7.2
Peru	4%	7.4
The Philippines	54%	0.4
Russia	18%	1.9
Singapore	42%	4.2
Chinese Taipei	29%	18.6
Thailand	40%	1.7
United States	35%	12.3

<sup>177</sup> Rapyd (2021) The Top 6 Super Apps in Asia—And What They Reveal about the Global Trend,

<https://www.rapyd.net/blog/the-top-6-super-apps-in-asia-and-what-they-reveal-about-a-global-trend/>

<sup>178</sup> This research is intended to focus on FinTech-enabled digital payments and therefore excludes card transactions which could involve the physical card. A conservative approach towards estimating digital transactions was taken. Where data was available, only physical card transactions were excluded. However, when card transaction data did not clearly distinguish between physical and non-physical card use (i.e., online transactions), the full number of card transactions was excluded.

<sup>179</sup> “All transactions” include cash, card and non-card digital transactions. For countries where 2021 data is unavailable, we projected the number and value of transactions in 2021 using data from past years. There is a lack of reliable data on digital transactions for Brunei Darussalam; Papua New Guinea; and Hong Kong, China. Therefore, they are not included in this portion of the quantitative analysis. Empirical analysis suggests that rates and habits of digital payments adoption are similar between these economies and APEC peers, especially those which share similar stages of economic and digital development.

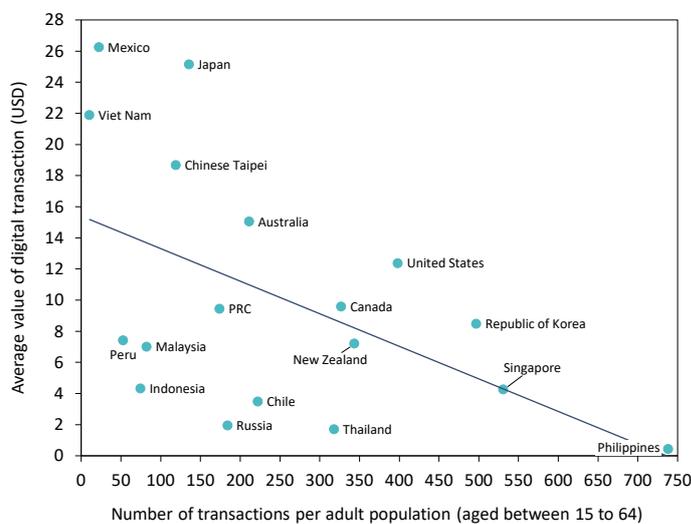
<b>Viet Nam</b>	<b>43%</b>	<b>21.9</b>
<b>Across 18 APEC economies</b>	<b>26%</b>	<b>10.2</b>

### *Relationship between Number and Average Value of Digital Transactions*

Despite the large number of digital transactions in APEC economies, most of the transactions conducted are small-value transactions (Figure 3).<sup>180</sup> Comparing the number of digital transactions per adult and the average value of a digital transaction in each economy, for every 50 additional transactions per adult, the average transaction value drops by USD1.

**Figure 3: Relationship between Number and Average Value of Digital Transactions**

**As the number of digital transaction per adult increases, the average value of each transaction decreases**



This observation aligns with the varied uses of digital payments in APEC economies and suggests that legacy systems are an important factor in driving digital payments adoption in APEC economies. In economies where digital payments are common, such as the Philippines; Singapore; and Korea, the average transaction tends to be low in value. People in these markets use digital payments for everyday consumption, serving as a direct alternative to cash or point-of-service card payments. In contrast, consumers in economies such as Mexico; Viet Nam; and Japan use digital payment methods less frequently and for larger payment sizes. In these cases, digital payments could be a substitute for larger online card transactions, checks, or bank transfers. These tend to be environments with more sophisticated card infrastructures prior to the market entry of digital payments. As such, it is critical for government policy in each economy to be tailored for the system that digital payments are designed to replace and adapted for the strengths of its private sector. The box below shows how small-value digital payments quickly gained traction in China, led by private sector players.

#### **Box 11: China as an Early Adopter of Digital Payments**

<sup>180</sup> The value of transactions has not been weighted by purchasing power in this analysis.

In China, digital and mobile payments are ubiquitous and permeate every aspect of citizens' daily life, including paying transportation fares, making small purchases at convenience stores, paying for food delivery, giving out red packets during Chinese New Year, and making cross-border transfers. In 2021, only 5% of payment transactions used physical currency. According to figures published by PBOC, online payment transactions processed by non-bank financial institutions grew 24% year-on-year in 2021, amounting to more than one trillion transactions with a total value of CNY 355 trillion (USD53 trillion).<sup>181</sup>

WeChat Pay and AliPay are the two dominant payment platforms in China, accounting for 94% of the mobile payment market in the first quarter of 2020.<sup>182</sup> This represents over 1.5 billion monthly active users as of 2021.<sup>183,184</sup> The former was launched in 2013 as an additional feature of Tencent's instant messaging app, whereas AliPay debuted in 2004 as an escrow payments service for its online shoppers.

Tencent and Alibaba have led the digital payment revolution to disintermediate the banking system. The adoption of digital payments is mainly driven by the high penetration rate of smartphones and bank account ownership, the offer of low-cost payment options for merchants, and the proliferation of e-commerce. Since the outbreak of the pandemic, contactless digital payment methods, such as e-wallets, QR code payments, and the use of facial recognition technologies, have been encouraged to prevent the spread of COVID-19.<sup>185</sup> The lockdowns have also accelerated online B2C and P2P payments, while some local governments have made use of the WeChat platform to distribute vouchers to stimulate consumption.<sup>186</sup>

The technological advancement of China's payment market had been driven by the private sector prior to the government's development of its sovereign digital currency (e-CNY), beginning in 2017. Digital currency pilots were first conducted in late 2019 in four major cities under different application scenarios, such as utility and salary payments.<sup>187</sup> Millions worth of digital CNY has been distributed through a lottery system to boost adoption.<sup>188</sup> AliPay and WeChat also launched a new feature in their payment apps to facilitate the use of the e-CNY wallet.<sup>189</sup> With the eventual deployment of the e-CNY across the economy, cash transactions will be further replaced to enable China to move towards a cashless society. This will also support the internationalisation of the CNY.

### 3.2 Digital Transactions and Digital Trade Growth

The second part of the analysis explores the relationship between digital transactions and digital trade growth. The IMF defines digital trade as cross-border transactions that are digitally ordered (i.e., cross-border e-commerce), digitally facilitated (by platforms), or digitally delivered.<sup>190</sup> Past research demonstrates that digital technology plays an important role in supporting international

<sup>181</sup> The People's Bank of China (2021), Payment System Report (2021),

<http://www.pbc.gov.cn/en/3688110/3688172/4437084/4525787/2022040622295461615.pdf>

<sup>182</sup> East West Bank (2021), How WeChat Pay and Alipay Can Strategically Grow Your Business,

<https://www.eastwestbank.com/ReachFurther/en/News/Article/WeChat-Pay-and-Alipay>

<sup>183</sup> Statista (2022), Monthly active users of leading payment apps in China 2021, <https://www.statista.com/statistics/1211923/china-leading-payment-apps-based-on-monthly-active-users/>

<sup>184</sup> Business of Apps (2022) WeChat Revenue and Usage Statistics, <https://www.businessofapps.com/data/wechat-statistics/>

<sup>185</sup> Daxue Consulting (2021), Payment methods in China: How China became a mobile-first nation, <https://daxueconsulting.com/payment-methods-in-china/>

<sup>186</sup> Technode (2020), Qingdao is using WeChat for vouchers to boost spending, <https://technode.com/2020/03/23/qingdao-is-using-wechat-for-vouchers-to-boost-spending/>

<sup>187</sup> Xinhua Net (2021), China Focus: China to steadily advance digital yuan pilots, [http://www.xinhuanet.com/english/2021-07/17/c\\_1310065964.htm](http://www.xinhuanet.com/english/2021-07/17/c_1310065964.htm)

<sup>188</sup> China Banking News (2021), Beijing to Hold 40 Million Yuan Digital Renminbi Lottery in June,

<https://www.chinabankingnews.com/2021/06/02/beijing-to-hold-40-million-yuan-digital-renminbi-lottery-in-june/>

<sup>189</sup> SCMP (2022), China digital currency: leading mobile payment apps Alipay, WeChat Pay install new features to help widen e-CNY roll-out, <https://www.scmp.com/tech/big-tech/article/3176812/china-digital-currency-leading-mobile-payment-apps-alipay-wechat-pay>

<sup>190</sup> IMF (2018), Towards a Handbook on Measuring Digital trade: Status Update, <https://www.imf.org/external/pubs/ft/bop/2018/pdf/18-07.pdf>

trade and economic activity.<sup>191</sup> The value of global ICT services' exports grew 6% to reach USD676 billion in 2020 as the usage of communications services, computer services, and software was boosted by the lockdown restrictions implemented in many economies.<sup>192</sup>

FinTech technologies can play a critical role in enabling digital trade. For example, the data stored and shared on secure blockchain-based databases could enable financial institutions to authorise and verify identity and reduce costs associated with verifying parties to a transaction. The use of AI to leverage network data and real-time payment behaviours to develop more accurate, real-time credit scores and associated tools to monitor investments and financing decisions could also help to strengthen digital trade growth.<sup>193</sup>

### 3.2.1 Analysing the Relationship between Digital Transactions and Digital Trade Growth

To examine potential relationships between the extent to which an economy uses digital transactions and the extent to which it participates in digital trade, we compared the proportion of digital transactions in each APEC member economy to the proportion of digital exports it recorded in 2021.

Digital exports are defined to include: (i) digitally-enabled goods, which are traded via e-commerce; (ii) digitally-enabled services, which refers to services provided through digital technologies, such as online consultancy services, as well as e-service exports, such as electronic banking; and (iii) indirect digital services embedded in other exports, which includes imported digital services that get used in the exporting of other products and services, such as the use of email by a firm when exporting overseas. The detailed methodology to calculate digital exports is provided in Appendix II. Figure 4 compares the proportion of digital transactions and share of digital trade for the 18 APEC economies for which digital transaction data is available.

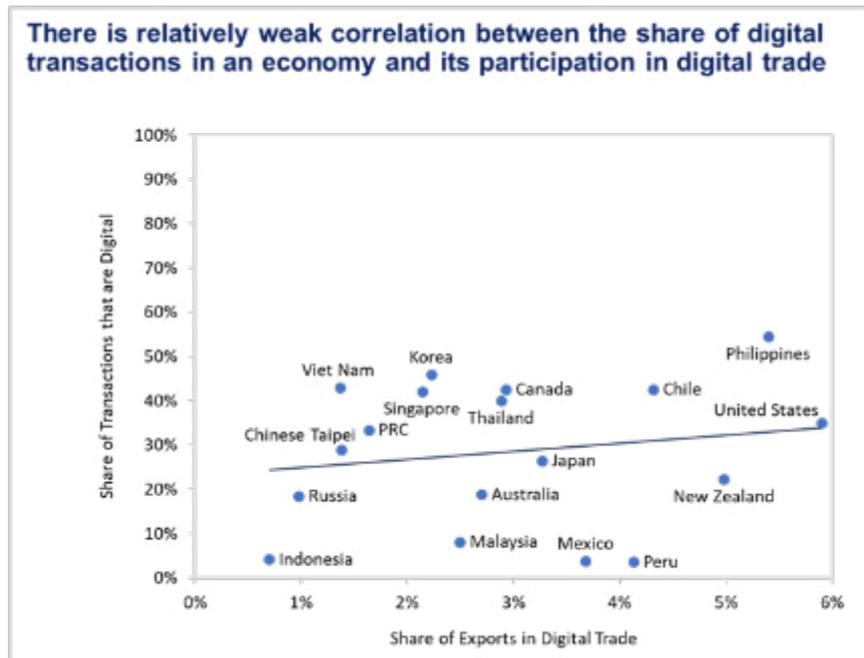
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<sup>191</sup> APEC (2021), Trade Facilitation under the Current COVID-19 Pandemic and Beyond, [https://www.apec.org/docs/default-source/publications/2021/12/utilizing-digital-technology-in-the-field-of-trade-facilitation-under-the-current-covid-19-pandemic-and-beyond-beyond-practices-sharing-workshops/221\\_cti\\_utilizing-digital-technology-in-the-field-of-trade-facilitation.pdf?sfvrsn=5f4be66c\\_2](https://www.apec.org/docs/default-source/publications/2021/12/utilizing-digital-technology-in-the-field-of-trade-facilitation-under-the-current-covid-19-pandemic-and-beyond-beyond-practices-sharing-workshops/221_cti_utilizing-digital-technology-in-the-field-of-trade-facilitation.pdf?sfvrsn=5f4be66c_2)

<sup>192</sup> UNCTAD (2021) Trade data for 2020 confirm the growing importance of digital technologies during COVID-19, <https://unctad.org/news/trade-data-2020-confirm-growing-importance-digital-technologies-during-covid-19>

<sup>193</sup> FinTech Futures (2021) An era of digital trade, <https://www.FinTechfutures.com/2021/05/an-era-of-digital-trade/>

Figure 4: Proportion of Digital Transactions and Digital Trade



We observed a positive correlation between the proportion of digital transactions in APEC economies and the share of their exports that are digitally enabled. However, this correlation is relatively weak. This suggests that FinTech's potential impact on digital trade has not yet been fully realised, a result of the limited adoption of cross-border digital payment platforms. The use cases of digital transactions that might have the greatest impact on enabling digital trade, including mobile wallet payments for imports and e-commerce, have been slow to hit the market.<sup>194</sup> The delay is due to the need to comply with regulations in all user markets, including Know Your Customer (KYC), accounting, and data privacy standards. Consumers are not yet confident in these pioneering platforms, so many choose to pay by credit card, international wire transfer, or money transfer services. At present, the most common cross-border digital transactions are business-to-business (B2B) transactions. In the e-commerce space, a domestic online retailer may accept payments from customers through credit cards but pay their foreign suppliers via digital channels. As these B2B transactions are repeated between the same parties, the cost of finding suitable digital payment platforms is lower, and the parties may have more trust in new payment systems.

The relationship between the proportion of digital transactions and digital trade is also not uniform across all economies. Economies that have a high share of digital trade exports but average digital transaction levels include the US and New Zealand. This reflects the slower adoption of digital payments in developed markets, where the card payment infrastructure is more established. For consumers in these markets, digital payments provide less of an incremental benefit as they already have access to attainable cash alternatives. As a result, they are slower to adopt digital payments.

Overall, challenges in adopting cross-border digital payments could be abated by stronger coordination between APEC governments and payment platforms. The Digital Economy Agreements

<sup>194</sup> The Business Times (2021) The rise of instant cross-border payments: Boon or bane for banks?, <https://www.businesstimes.com.sg/asean-business/the-rise-of-instant-cross-border-payments-boon-or-bane-for-banks%C2%A0>

(DEA) that Singapore has negotiated with various economies, including APEC economies, as well as the Digital Economy Partnership Agreement (DEPA) between Chile, New Zealand, and Singapore, provide good models of international frameworks meant to foster interoperability of standards and systems and digital trade (see text box below). Partnerships between corporate players, including Mowali, an initiative of Orange and MTN in West Africa, allow companies to navigate the regulatory process together.<sup>195</sup> This reduces the resource burdens on companies and regulators in creating cross-border payment systems. In 2020, the international payments operator SWIFT announced its intention to support the adoption of international digital payments through its gpi system, which should help banks in different economies transfer instantly to each other.<sup>196</sup> These collaborations force governments, companies, and international bodies to work together on robust regional and international payment systems that earn consumer trust and capture the potential benefits of cross-border digital trade.

### Box 12: Singapore's Digital Economy Agreements with APEC Economies

Singapore has concluded Digital Economy Agreements (DEA) with various APEC economies, including Australia; Chile; and Korea. These DEAs aims to establish digital trade rules and digital economy collaborations between two or more economies.<sup>197</sup>

Specific areas of collaboration under Singapore's DEAs include: (i) aligning rules and standards and facilitating interoperability between digital systems; (ii) supporting cross-border data flows and safeguarding personal data and consumer rights; as well as (iii) encouraging cooperation in nascent areas, such as digital identities and AI. By establishing common rules for digital trade, DEAs can contribute to lowering the cost of operating cross-border businesses and increasing access to overseas markets, allowing economies to participate more actively in digital trade. Through DEAs with key partners, Singapore hopes to develop and support businesses that engage in digital trade and e-commerce.

The Australia-Singapore Digital Economy Agreement (DEA), signed in August 2020, provides a range of new trade rules and a comprehensive framework for bilateral cooperation to reduce digital trade barriers and enable businesses and consumers in both Australia and Singapore to capitalise on the digital economy.<sup>198</sup>

Among other areas, the DEA delivers robust rules to ensure that businesses, including those in the financial sector, can transfer data across borders without being required to build or use data storage centres in either jurisdiction. It also establishes new commitments on compatible e-invoicing and e-payment framework and sets the stage for Singapore and Australia to collaborate closely in supporting the harmonisation of key international standards to support digital trade. Under the auspices of the DEA, Australia and Singapore also signed a series of Memorandums of Understanding (MOUs) on areas that include data innovation, AI, e-invoicing, e-certification for agricultural exports and imports, trade facilitation, personal data protection, and digital identity.

Chile, New Zealand, and Singapore also signed the Digital Economy Partnership Agreement (DEPA) in June 2020, which has attracted interest from a number of APEC economies since entering into force<sup>199</sup>. The DEPA

<sup>195</sup> GSMA (2020) The many paths to mobile money interoperability: Selecting the right technical model for your market, [https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/06/GSMA\\_Many-paths-to-mobile-money-interoperability-2.pdf](https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/06/GSMA_Many-paths-to-mobile-money-interoperability-2.pdf)

<sup>196</sup> SWIFT (2020) SWIFT enables instant 24/7 cross-border payments, <https://www.swift.com/news-events/press-releases/swift-enables-instant-247-cross-border-payments>

<sup>197</sup> Ministry of Trade and Industry Singapore (2022) Digital Economy Agreements, <https://www.mti.gov.sg/Improving-Trade/Digital-Economy-Agreements>

<sup>198</sup> Australian Department of Foreign Affairs and Trade (2020), Australia-Singapore Digital Economy Agreement, <https://www.dfat.gov.au/trade/services-and-digital-trade/australia-and-singapore-digital-economy-agreement>

<sup>199</sup> New Zealand Ministry of Foreign Affairs and Trade (2021), Digital Economy Partnership Agreement (DEPA), <https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-in-force/digital-economy-partnership-agreement-depa/>

includes a specific provision on financial technology cooperation, including between entrepreneurs and start-up talent, as well as commitments to promote interoperability in e-invoicing, and e-payment standards. Under the DEPA's module on SME cooperation, the DEPA Parties also held a dialogue between entrepreneurs and start-up talent, as well as commitments to promote interoperability in e-invoicing and e-payment standards. Under the DEPA's module on SME cooperation, the DPEA Parties also held a dialogue between small businesses and regulators in the FinTech sector as an early implementation initiative.

### 3.3 An Enabling Policy Environment and FinTech Activity

This section explores the relationship between the strength of the policy environment, the level of FinTech activity, and the economic development of an economy. To quantify the strength of the policy environment in each APEC member economy, a policy index with two key pillars was developed based on the policy aspects identified in Section 3. Pillar 1 in Table 2 covers policy factors that create an enabling environment for FinTech, while Pillar 2 in Table 3 considers a strong foundational framework—with both setting out the scoring for each of the variables considered. Data for the period 2016 to 2021 was collated for each of the variables within the index.

**Table 2: Pillar 1—Enabling Policy Environment**

No.	Pillar 1: Enabling policy environment for FinTech (Composite score)	3 - Yes	2 - Somewhat	3 - No
1	Is there an economy-wide strategy for FinTech, or coordinated plans to grow the FinTech industry at the domestic level?	An economy-wide strategy for FinTech or plans coordinated across different agencies is in place	An economy-wide strategy for FinTech or plans coordinated across different agencies is being developed	No ongoing action to develop an economy-wide strategy for FinTech or plans coordinated across different agencies
2	Do regulations on digital payment services address the growth of FinTech companies in the digital payment services space?	Specific regulations governing the role of FinTech companies in the digital payment space are in place	Regulations on how FinTech companies can operate in the digital payment space are being developed	No ongoing action to develop specific regulations governing the role of FinTech companies in the digital payment space
3	Are there frameworks or regulations targeted at building a robust and inclusive open banking system	Frameworks or regulations targeted at building a robust and inclusive open banking system are in place	Frameworks or regulations targeted at building a robust and inclusive open banking system are being developed	No ongoing action to develop frameworks or regulations targeted at building a robust and inclusive open banking system
4	Are there targeted policies or programmes to encourage the development of FinTech start-	Targeted policies or programmes to encourage the development of	Targeted policies or programmes to encourage the development of	No ongoing action to develop policies or programmes to encourage the

No.	Pillar 1: Enabling policy environment for FinTech (Composite score)	3 - Yes	2 - Somewhat	3 - No
	ups (e.g., regulatory sandboxes)?	FinTech start-ups are in place	FinTech start-ups are being developed	development of FinTech start-ups
5	Is the economy party to bilateral or multi-stakeholder agreements that promote FinTech collaboration?	Party to bilateral or multi-stakeholder agreements that promote FinTech collaboration	Ongoing negotiations to become party to bilateral or multi-stakeholder agreements that promote FinTech collaboration	No ongoing negotiations to become party to bilateral or multi-stakeholder agreements that promote FinTech collaboration

**Table 3: Pillar 2—Strong Foundational Frameworks**

No	Pillar 2: Strong foundational frameworks (composite score)	3 - Yes	2 - Somewhat	1 - No
1	Is there an economy-wide strategy for cybersecurity or framework governing cybersecurity?	Economy-wide strategy and/or framework governing cybersecurity in place	Economy-wide strategy and/or framework governing cybersecurity is being developed	No ongoing action to develop an economy-wide strategy and/or framework governing cybersecurity
2	Is there an updated and comprehensive economy-wide framework to govern data protection and privacy?	There is an updated and comprehensive economy-wide framework to govern data protection and privacy	Laws to govern data protection and privacy are comprehensive and updated, but there is no single overarching framework	Laws on data protection and privacy not comprehensive or updated
3	Are there robust consumer protection frameworks that explicitly cover online or digital transactions?	Robust consumer protection frameworks that explicitly cover online or digital transactions are in place	Robust consumer protection frameworks that clearly cover online or digital transactions are being developed	No ongoing action to develop robust consumer protection frameworks that cover online or digital transactions

Pillar 2: Strong foundational frameworks (composite score)				
No		3 - Yes	2 - Somewhat	1 - No
4	Is there a strong intellectual property protection regime? <sup>200</sup>	Scored 5 or below in the Intellectual Property Rights component of the International Property Rights Index	Scored between 5 and 6.5 in the Intellectual Property Rights component of the International Property Rights Index	Scored over 6.5 in the Intellectual Property Rights component of the International Property Rights Index
5	Are there government-led initiatives to upskill the population that are digitally coordinated at the economy-wide level?	There is a coordinated government-led effort to upskill the population digitally	There are plans to develop a coordinated framework or strategy to upskill the population digitally	There are some government-led initiatives to upskill the population digitally, but these are not coordinated at the economy-wide level
6	Is there an economy-wide ID system or framework that enables the creation of a single, secure digital ID across different platforms?	Economy-wide ID system or framework that enables the creation of a single, secure digital ID across different platforms in place	Economy-wide ID system or framework that enables the creation of a single, secure digital ID across different platforms is being developed	No ongoing action to develop an economy-wide ID system or framework that enables the creation of a single, secure digital ID across different platforms

### 3.3.1 Key Observations

Multi-factor regression analysis was conducted to illustrate the impact of the two policy pillars on the number of digital transactions and the broader economy. Two regression models were used. The first model showed the change in the number of digital transactions driven by changes in the enabling environment for FinTech (Pillar 1) and the foundational frameworks (Pillar 2). The second model compared changes in GDP per capita against changes in both pillars. A detailed methodology for the regressions, along with coefficients and standard errors, can be found in [Appendix II](#).

**Observation 1: Economies with stronger foundational policy frameworks tend to have more digital transactions, even after controlling for the size of the labour force and level of development.**

In Regression Model 1, we modelled the number of digital transactions in any economy as a function of its level of development (GDP per capita), the size of its labour force, and the two pillars of our policy index (Figure 5).<sup>201</sup> In this case, an immediate and statistically significant correlation between

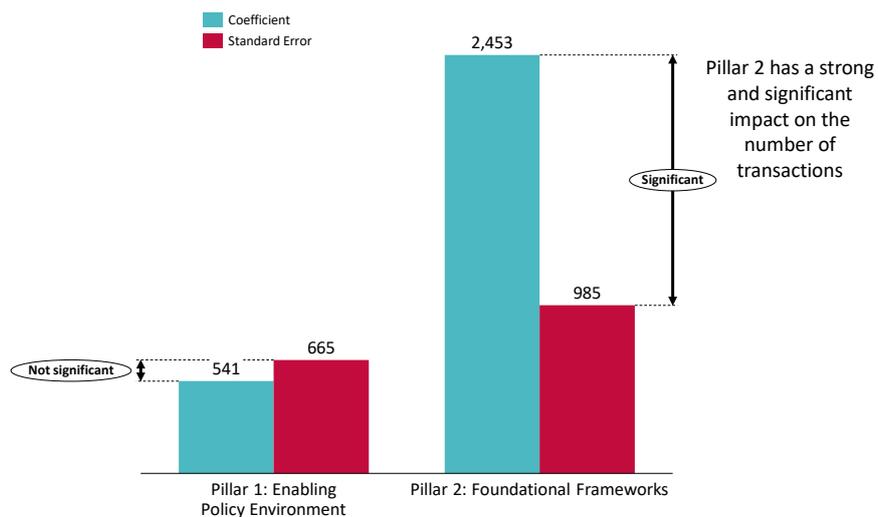
<sup>200</sup> A proxy was used if the economy is not recorded in the Index.

<sup>201</sup> We also controlled for an economy's fixed effects.

the strength of an economy's foundational framework environment (Pillar 2) and the number of digital transactions was observed. In economies that have domestic frameworks on data privacy, consumer protection, and digital upskilling, policies that inspire trust in digital finance were far more likely to observe higher numbers of digital transactions. Results using a two-year time lag between the foundational frameworks environment (Pillar 2) and the number of digital transactions were similar.<sup>202</sup> This is noteworthy, as it suggests that feedback between strong foundational frameworks and outcomes in digital transactions is immediate. We did not observe a statistically significant correlation between enabling Pillar 1 and the number of digital transactions. As digital payments have only been adopted by most economies in recent years, we expect this correlation to emerge in the future, once digital payments are more embedded in consumers' day-to-day lives.

**Figure 5: Regression Model 1**

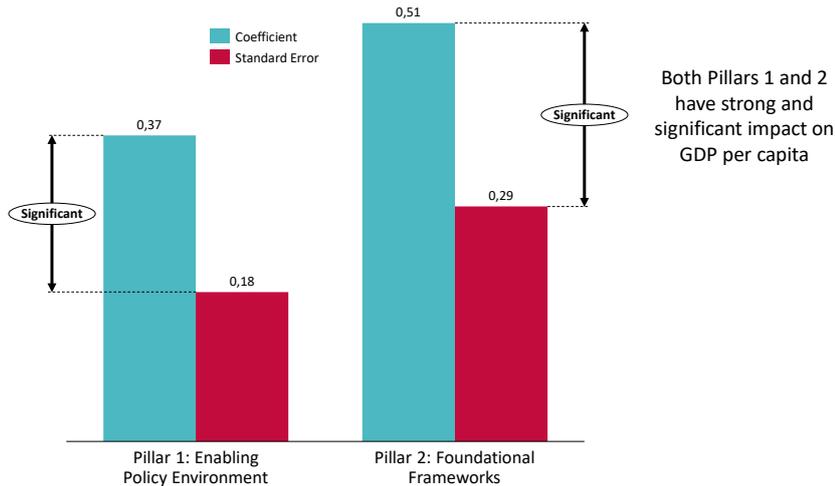
**Regression Model 1: Relationship between policy pillars and the number of digital transactions**



**Figure 6: Regression Model 2**

<sup>202</sup> See regression 3 in Appendix II.

### Regression Model 2: Relationship between policy pillars and GDP per capita



#### Observation 2: Higher GDP per capita is correlated with a strong foundational framework environment

In Regression Model 2, we modelled GDP per capita as a function of the two policy pillars and controlled for internet usage, the World Bank's WGI Political Stability Index, and the impact of the COVID-19 pandemic (Figure 6).<sup>203</sup> We examined the impact of the change in policy environment each year on the GDP per capita two years later. This reflects the time it takes for policy to be implemented and for consumer behaviour to adjust.

The results of Regression Model 2 suggest that economies with stronger foundational framework environments (Pillar 2) typically have a higher GDP per capita in the future. A one-point increase in the foundational environment pillar of our policy index corresponds to a USD507 increase in GDP per capita two years later. This could be attributed to a strong foundational framework environment that allows consumers to transact at lower cost, stimulating consumption and entrepreneurship to stimulate GDP per capita growth. Given this observation, there is scope for knowledge sharing and capacity building across APEC member economies to strengthen foundational frameworks, particularly in areas such as crafting a strong cybersecurity strategy. One example is the ASEAN-Singapore Cybersecurity Centre of Excellence (ASCCE), which collaborates with a range of international partners and experts to deliver cybersecurity training programmes to senior officials in ASEAN and beyond. The ASCCE was announced in 2018 and seeks to strengthen ASEAN's cybersecurity strategy development, legislation, and research capabilities.<sup>204</sup> Besides providing training, it also promotes the sharing of publicly accessible information on cyber threats and attacks, as well as good practices, and conducts research in areas such as international law, cyber strategy, legislation, cyber norms, and other cyber-security policy issues.<sup>205</sup>

#### Observation 3: A strong enabling policy environment for FinTech is correlated with higher GDP per capita.

<sup>203</sup> We also controlled for an economy's fixed effects.

<sup>204</sup> Cybersecurity Agency of Singapore (2021) ASEAN-Singapore Cybersecurity Centre of Excellence, <https://www.csa.gov.sg/News/Press-Releases/asean-singapore-cybersecurity-centre-of-excellence>

<sup>205</sup> The Straits Times (2021) ASEAN-Singapore Centre for training National Cyber-Security Teams Opens New Campus, <https://www.straitstimes.com/tech/tech-news/asean-spore-centre-for-training-national-cyber-security-teams-opens-new-campus>

Observation 3 also draws on the results of Regression Model 2 (Figure 6). The coefficients suggest that a one-point increase in the enabling policy environment for the FinTech pillar (Pillar 1) of the policy index corresponds with a USD371 increase in GDP per capita two years later. This result is statistically significant, suggesting that a stronger focus on policies that enable FinTech specifically could have a positive impact beyond the financial services sector and benefit the entire economy.

One example of how FinTech can drive overall impact is through empowering SMEs.<sup>206</sup> SMEs in most APEC economies face significant barriers to attaining credit due to the perceived default risk and high documentation requirements of commercial banks.<sup>207</sup> Digital lenders are best positioned to provide credit solutions for SMEs. Services like automatic approvals and open APIs could make credit access far easier.<sup>208</sup> To maximise this benefit, economies must improve their enabling policy environments. Open banking frameworks, regulatory sandboxes, and digital payments regulations have allowed more FinTech firms to lend to SMEs in APEC economies. Tienda Pago, a FinTech lender, has been able to provide digital credit to thousands of small businesses in Mexico and Peru due to growth-oriented digital payment regulations.<sup>209</sup> In Malaysia, 16 digital lenders focused on SMEs are currently testing offerings in Bank Negara’s regulatory sandbox.<sup>210</sup>

Overall, the econometric analysis supported the case for stronger, targeted policies that enable the growth of FinTech and strengthen foundational frameworks to create economy-wide gains. Empirical evidence further suggests that FinTech could also help to strengthen financial inclusion across the APEC economies. The box below provides further details.

### Box 13: FinTech can be Leveraged to Strengthen Financial Inclusion

Digital financial services, enabled by FinTech, can help to strengthen financial outreach to large, unbanked populations and increase financial inclusion in a secure and low-cost manner. Applications of FinTech that can increase financial inclusion include mobile money, cross-border remittances, and government transfers.

**Mobile Money:** The use of mobile money has risen significantly in developing economies over the past few years, capitalising on high mobile phone penetration rates. As of 2020, there were 850 million registered mobile money accounts across 90 economies, with USD1.3 billion transacted via these accounts each day. Within APEC, the number of e-money accounts in the Philippines rose by 16.8 million from 2019 to October 2021, contributing significantly to the government’s plan to include 70% of the adult population within the financial inclusion net (i.e., have access to banks or e-money channels) by 2023.<sup>211</sup>

**Cross-border Remittances:** EY estimates that cross-border remittances will reach USD800 billion in 2022.<sup>212</sup> Past research shows that the average global cost to send remittances cross-border in the form of cash is 6.8%, while a fully digital transaction could drop the cost to 3.3%, representing significant cost savings for migrant workers and the households they support. FinTech companies can provide flexible payment options, lower fees, and reduced transaction times through cross-border payment rails that don’t run on traditional bank networks or technology solutions that allow clients to connect to legacy bank rails more

<sup>206</sup> NTU Centre for African Studies (2021) Can FinTech meet the financing needs of African SMEs?, <https://www.ntu.edu.sg/cas/news-events/news/details/can-FinTech-meet-the-financing-needs-of-african-smes>

<sup>207</sup> APEC (2020) Overview of the SME Sector in the APEC Region, [https://www.apec.org/docs/default-source/Publications/2020/4/Overview-of-the-SME-Sector-in-the-APEC-Region---Key-Issues-on-Market-Access-and-Internationalization/220\\_PSU\\_SME-Market-Access-and-Internalization.pdf](https://www.apec.org/docs/default-source/Publications/2020/4/Overview-of-the-SME-Sector-in-the-APEC-Region---Key-Issues-on-Market-Access-and-Internationalization/220_PSU_SME-Market-Access-and-Internalization.pdf)

<sup>208</sup> ADB (2019) FinTech for Asian SMEs, <https://www.adb.org/publications/FinTech-for-smes>

<sup>209</sup> Triodos Investment Management (2021) Digital credit for small stores in Mexico and Peru, <https://www.triodos-im.com/articles/2021/investment---tiendapago>

<sup>210</sup> Bank Negara Malaysia (2022) Regulatory Sandbox, <https://www.bnm.gov.my/sandbox>

<sup>211</sup> The Inquirer (2022) 41 million Filipinos now have banking, e-money access, <https://business.inquirer.net/341084/41m-filipinos-now-have-banking-e-money-access>

<sup>212</sup> Ernst and Young (2021) How new entrants are redefining cross-border payments, [https://www.ey.com/en\\_sg/banking-capital-markets/how-new-entrants-are-redefining-cross-border-payments](https://www.ey.com/en_sg/banking-capital-markets/how-new-entrants-are-redefining-cross-border-payments)

easily. As FinTech companies become more entrenched in the remittance space, they are also experimenting with novel approaches, such as remittances based on distributed ledger technology (DLT). A bidirectional messaging and settlement component validates transactions using DLT before funds are transferred, enhancing the efficiency of cross-border transactions.<sup>213</sup>

**Government transfers:** During the COVID-19 pandemic, FinTech's role in the equitable disbursement of government support became especially clear. Digital financial services enabled by FinTech can strengthen accountability and improve the ability to track where government funds are spent, and will eventually be able to evaluate the impact of interventions.

### 3.4 Limitations

Overall, the analysis is aligned with our assumptions that a strong foundational environment and enabling policy environment for FinTech correlate with strong economic performance for an economy. Nevertheless, it is important to acknowledge the limitations of the analysis conducted. First, while the policy index was based on a comprehensive literature review on the existence of frameworks or policies relevant to FinTech, it does not consider an exhaustive list of relevant policies or measure the strength of implementation of these policies and frameworks. As such, it can only be understood as an overall indication of FinTech readiness, rather than a comprehensive scorecard.

Second, in regression or correlation-based analysis, it is critical to make the distinction between causation and correlation. While explanations for the empirical observations have been proposed, it should be acknowledged that there could be other reasons for these observations that the analysis did not fully capture. One such reason is the potential for reverse causality. The correlations drawn in this analysis could reflect the possibility that a vibrant FinTech ecosystem can grow the wealth of an economy. Alternatively, our results could reflect that more advanced economies are more likely able to support a vibrant FinTech ecosystem. It is likely that both effects are at play in APEC economies. With this analysis, we cannot determine which effect plays a larger role.

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<sup>213</sup> PWC (2021) The evolving landscape of cross-border payments, <https://www.pwc.in/assets/pdfs/consulting/financial-services/FinTech/point-of-view/pov-downloads/the-evolving-landscape-of-cross-border-payments.pdf>

## 4. Conclusion and Recommendations

This section draws together key insights from previous sections and provides recommendations for APEC member economies to consider as the next steps in encouraging greater coordination for FinTech growth and innovation.

The FinTech landscape has a varying level of maturity across APEC, with certain key hubs, such as the US and China, dominating due to their economic stature. Markets such as Australia; Canada; Hong Kong, China; and Singapore have large FinTech ecosystems relative to their size, while the rest of APEC is also home to emerging FinTech innovation, albeit on a smaller scale. Payments is a priority segment of FinTech innovation—for almost all APEC economies, the payments segment is the largest by volume and share of its domestic market. This is reflective of the importance of payments to the digital economy and digital trade growth.

Two types of policy frameworks are employed by governments to encourage growth in FinTech innovation—foundational and enabling frameworks—and both are necessary to unlock the full economic potential of FinTech. Foundational policy frameworks such as data privacy regulations apply to sectors beyond just finance, providing the building blocks for products and services, such as cross-border payments, that are essential for digital trade. On the other hand, enabling frameworks, such as those which encourage interoperability between domestic payments systems, apply to specific portions of domestic FinTech ecosystems and produce greater innovation and efficiency.

APEC provides a strong coordination mechanism for its constituent members to share good practice policies in FinTech to diffuse its economic benefits: greater consumer choice and protection, financial inclusion, and more vibrant digital economies. It is therefore essential for individual APEC markets to encourage greater harmonisation between their FinTech policy regimes to unlock these benefits at scale.

APEC and its member economies should consider a range of immediate and longer-term actions in this regard.

Key short-term actions include:

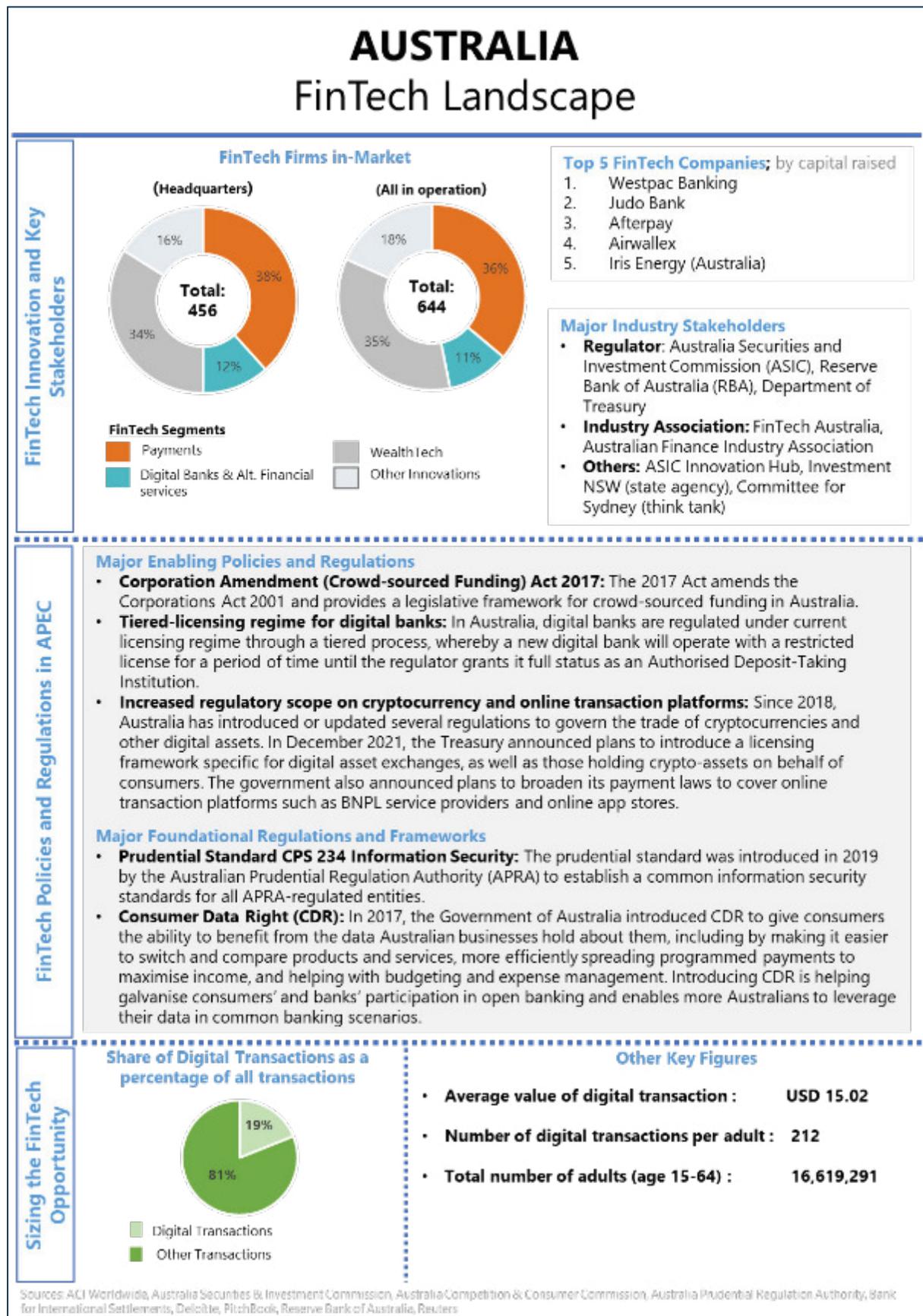
- **Establish a high-level FinTech coordination process:** To ascribe FinTech innovation with a requisite level of priority on APEC's broader policy agenda, a high-level FinTech coordination group or process could be established. The purpose of this group would be to agree on key policy objectives in the FinTech space for APEC and member economies and provide guidance and resources to working-level groups on FinTech policies. This group could initially be formed as part of the APEC Finance Minister's Process but would require cross-functional teams from across governments to ensure success.
- **Enhance cross-border cooperation to build capacity:** Cross-border knowledge-sharing and capacity building programmes could be introduced or enhanced to unlock significant learning avenues between member economies on best practices and approaches to develop their respective FinTech ecosystems. For instance, educational institutions and business exchange programmes with jurisdictions that have established digital skills initiatives can amplify the value of these initiatives and help facilitate digital upskilling across member economies and drive growth in high-tech sectors, including FinTech.

- **Create good practice policy guidelines:** Several APEC economies have world-class FinTech policy regimes, both in terms of foundational and enabling frameworks. APEC could develop a detailed compendium of good practices in each of these areas for policymakers to reference, thereby encouraging greater harmonisation in anticipation of more formal agreements or policy initiatives. Key good practice areas include e-KYC frameworks, cross-border payments, and data localisation thresholds.
- **Develop cross-border FinTech pilot initiatives:** To demonstrate the benefits of coordination at the APEC level in FinTech, all or a subset of member economies could develop a pilot regulatory initiative in an emerging area of innovation. There are many viable areas for a pilot programme, including implementation of CBPR to facilitate greater data sharing specifically in the finance sector, creating a set of regional guidelines for the use of AI in finance, or creating a cross-border regulatory sandbox to encourage innovation in RegTech.

Key longer-term actions include:

- **Develop a comprehensive FinTech cooperation framework:** APEC member economies could develop a comprehensive framework to enable cooperation in the FinTech space, setting out key economic targets and policies to grow their FinTech sectors. An initial three-year roadmap could be developed, with targets then geared for five-year intervals. Key strategies as part of this plan could be (1) encourage FinTech innovation; (2) examine domestic regulations with a view to harmonisation; (3) examine cross-border interoperability; and (4) align with broader economic agendas.
- **Create capacity-building programmes to facilitate cross-border digital trade:** There are key disparities between data privacy and cross-border data sharing regimes across different APEC economies. A capacity building programme for APEC economies could be beneficial to address these concerns and provide the knowledge and technical training necessary to implement good practice policies.
- **Establish an APEC FinTech Innovation Hub:** The disparities in the size of FinTech start-up ecosystems across APEC members are to be expected due to the differences in their respective economic sizes, but start-ups in certain economies could be further disadvantaged if their local ecosystems are less developed due to a lack of available capital and knowledge sharing between firms. An APEC-level start-up accelerator programme could be extremely beneficial in this regard, providing firms from all members with access to the capital and knowledge they need to develop innovative products and services. Accelerators could be hosted in member economies, such as the US, and investors could draw from the public sector, private sector, institutional investors, and impact investors.
- **Examine common data collection and reporting standards for FinTech sectors:** A key challenge in the development of this report was the lack of uniform data availability on the FinTech landscape and the prevalence of data on comparable policies in APEC member economies. This creates a barrier to measuring progress efficiently and effectively in the long term. To address this concern, APEC members could coordinate to examine common data collection and reporting standards for their FinTech sectors, which cover various aspects of the data presented in this report. This data could be published through a public portal or a FinTech 'index' to facilitate comparison of progress and better external research.

## Appendix I. APEC Economies FinTech Landscape Summary

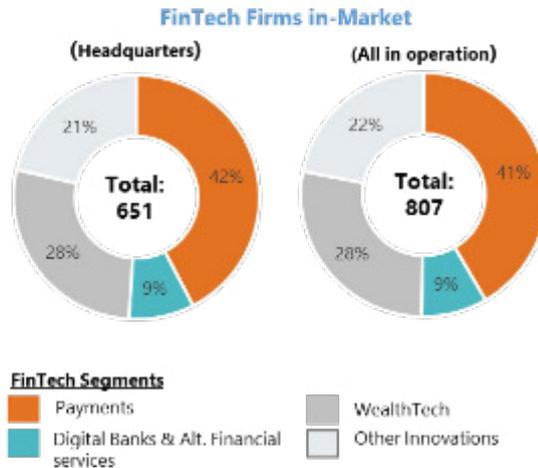


Note: FinTech landscape analysis for Brunei Darussalam and Papua New Guinea are not present due to insufficient data for analysis.

# CANADA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders



### Top 5 FinTech Companies; by capital raised

1. Nuvei
2. Clearco
3. Wealthsimple
4. Flexiti
5. Converge Technology Solutions

### Major Industry Stakeholders

- **Regulator:** Office of the Superintendent of Financial Institutions (OSFI), Consumer Financial Protection Bureau (CFPB)
- **Industry association:** The National Crowdfunding and FinTech Association of Canada;
- **Others:** Toronto Finance International (public-private partnership), Canadian Securities Administrators (CSA, an umbrella organisation of provincial and territorial securities regulators)

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

- **Retail Payment Activities Act (2021):** The Act is a first in regulating retail payment providers in Canada and comes amidst broader regulatory response to protecting consumers and fostering competition and innovation.
- **Amendments to the Bank Act:** Amendments in 2018 to the Bank Act introduced a Financial Consumer Protection Framework that came into effect on 30 June 2022. The Framework seeks to hold banks to a higher standard and requires them to take greater responsibility for consumer outcomes.
- **Regulations and Guidelines on virtual assets:** Amendments in 2014 to the AML/CTF law expanded the scope to include those 'dealing in virtual currencies' and required 'dealers of virtual currencies' to register with FINTRAC, the national financial intelligence agency. CSA has also introduced a series of guidelines for businesses dealing with virtual assets, such as SN 21-327 which provides guidance to crypto exchanges facilitating the buying and selling of virtual assets.

#### Major Foundational Regulations and Frameworks

Canada has introduced the Digital Charter Implementation Act (Bill C-27). If passed, the bill would enact three new statutes:

- **The Consumer Privacy Protection Act (CPPA)**, which replaces and repeals the Personal Information Protection and Electronic Documents Act, and the latter renamed to the Electronic Documents Act.
- **The Personal Information and Data Protection Tribunal Act**, which establishes a tribunal to review decisions made by the Privacy Commissioner of Canada and make orders for contraventions of the CPPA.
- The Artificial Intelligence and Data Act, which regulates international and interprovincial trade and commerce in artificial intelligence systems by establishing common requirements.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction :** USD 9.56
- **Number of digital transactions per adult :** 327
- **Total number of adults (age 15-64) :** 25,170,364

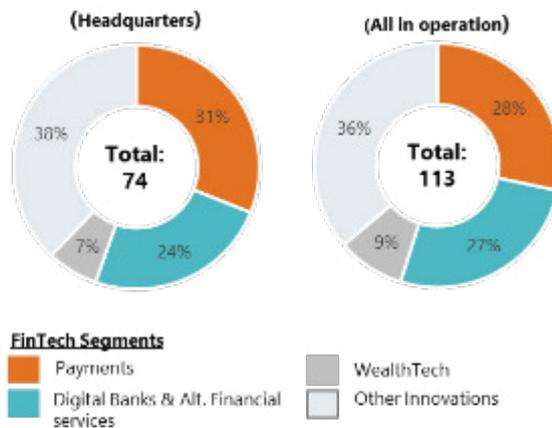
Sources: ACI Worldwide, Bank of Canada, Bank for International Settlements, IAPP.org, ICLG.com, Payments Canada, PitchBook, Statista.

# CHILE

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. Xepelin
2. Betterfly
3. Migrante
4. Fintual
5. Compara

#### Major Industry Stakeholders

- **Regulator:** Financial Market Commission, Corporation for the Promotion of Production (Corfo), Consumer Protection Agency
- **Industry Association:** FinteChile, Association of Banks and Financial Institutions (ABIF)
- **Innovation Facilitator:** Startup Chile

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

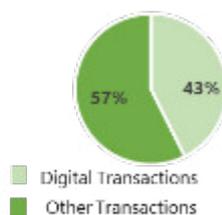
- **Digital Economy Agreement:** the agreement between Chile, New Zealand, and Singapore aims to foster collaboration in areas that can improve digital trade, including fintech, digital identity, e-invoicing, and data flows.
- **Financial Portability Law (2020):** The law facilitates consumers switching between financial institutions on behalf of individuals and micro-small businesses. All financial products are included, including loans, credit and debit cards, accounts, and lines of credit.
- **FinTech Bill:** Currently under consideration, the Bill would create an Open Finance Framework, lean towards risk-based regulation, and promote FinTech development and expansion. It sets the stage for regulating cryptocurrency, P2P lending, digital banks, open banking, and online investment brokers.

#### Major Foundational Regulations and Frameworks

- **National Cybersecurity Policy 2017-2022:** A framework that aims to ensure a free, open, safe and resilient cyberspace. It implements standard mechanisms for reporting, managing and responding to cybersecurity incidents.
- **Consumer Protection Law (Law No. 19,496):** The Law contains specific regulations for financial service providers, to ensure that consumers receive "simple" and "transparent" information that does not mislead them when contracting a product or service. Enforcement includes annulment, fines and compensation.
- **Digital Identity:** A Digital ID is one of six lines of action identified in the Government's digital transformation strategy. There are plans to upgrade the existing ClaveUnica digital ID system to operate on OpenID Connect, a leading industry standard for open authentication protocol that works on top of the OAuth 2.0 authorisation framework.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 3.46
- **Number of digital transactions per adult:** 223
- **Total number of adults (age 15-64):** 13,159,790

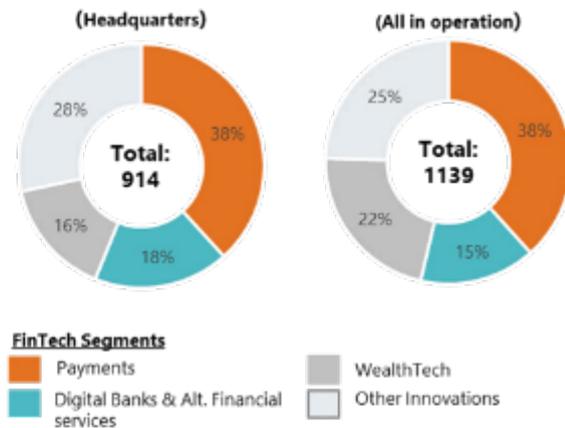
Sources: ACI Worldwide, Central Bank of Chile Payment System Studies, Pitchbook, S&P Global, Monetary Authority of Singapore, UN Office on Drugs and Crime, Practical Law (Thomson Reuters), OECD.

# PEOPLE'S REPUBLIC OF CHINA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. Alibaba Group
2. Ant Group
3. HengFeng Bank
4. Anbang Insurance Group
5. Lufax

#### Major Industry Stakeholders

- **Regulator:** People's Bank of China (PBOC), China Banking and Insurance Regulatory Commission, Securities Regulatory Commission of China
- **Industry Association:** National Internet Finance Association of China
- **International Organisation:** Global FinTech Lab

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

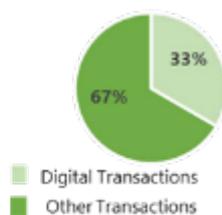
- **Licensing for Financial Holding Companies (FHCs):** In September 2020, PBOC passed a comprehensive entity-based framework to enhance regulation of large non-financial companies that have significant interests in financial services. The regulation mandates companies with two more or more different types of financial services (e.g. commercial banks, trusts, financial asset managers, securities companies, futures companies, insurance, or insurance asset management companies, etc.) to obtain a FHC license from the central bank, in addition to meeting certain capital and asset threshold. The license was introduced in response to the growing entry of Big Tech in the financial sector.
- **FinTech Cooperation Agreement:** In 2019, the Asia-Pacific Future Financial Research Institute, a leading think tank in China focused on research relating to the future of financial evolution, and Singapore's MAS signed a FinTech cooperation agreement to promote academic exchanges, information sharing and research cooperation on FinTech.

#### Major Foundational Regulations and Frameworks

- **Personal Information Protection Law (2021):** The PIPL is China's new data privacy law targeted at personal information protection and to address issues of personal data leaks. The PIPL is contoured similarly to the GDPR in terms of reporting data breaches, consent and data classification, but adds data localisation requirements for personal data and critical infrastructure data.
- **New Cybersecurity Measures:** Updates in 2022 bring cybersecurity standards up to date, and identify critical infrastructure to include network platform operators, securing quality of service. They also add further data localisation and require security assessments before "important" data may be transferred abroad.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 9.41
- **Number of digital transactions per adult:** 175
- **Total number of adults (age 15-64):** 997,343,951

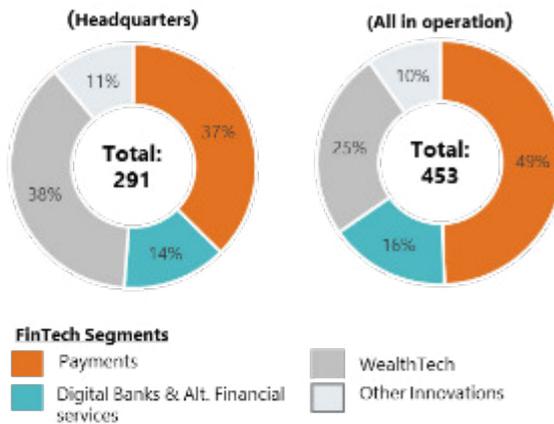
Source: ACI Worldwide, Bank for International Settlements, Deloitte, Monetary Authority of Singapore, People's Bank of China, Pitchbook, White & Case LLP

# HONG KONG, CHINA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. WeLab Holdings
2. Futu Securities
3. BIT Mining
4. TNG FinTech Group
5. ZA Bank

#### Major Industry Stakeholders

- **Regulator:** Hong Kong Monetary Authority (HKMA), Securities and Futures Commission, Insurance Authority, Mandatory Provident Fund Schemes Authority
- **Industry Association:** FinTech Association of Hong Kong
- **Government-led Innovation Facilitators:** HKMA-ASTRI FinTech Innovation Hub, HKMA Enhanced FinTech Supervisory Sandbox 2.0, Cyberport business park

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

- **Domestic FinTech Strategy:** In June 2021, HKMA unveiled "FinTech 2025" which sets out a high-level strategy for FinTech development in Hong Kong by 2025. The strategy covers five focus areas, which include (i) Banks to become fully digital, (ii) future-proofing for Central Bank Digital Currencies, (iii) creating next-generation data infrastructure, (iv) expanding the FinTech-savvy workforce, and (v) nurturing ecosystem with funding and policies.
- **Four-phase approach to open API:** HKMA has introduced a four-phase approach to Open API for the banking sector. Phase I and II, which covered product information and customer acquisition on financial information and products were launched by the end of 2019. Phase III and Phase IV were launched in May 2021 with a focus on enabling viable use cases involving lower implementation costs and risks.
- **Revised guidelines for digital bank licensing:** In 2018, HKMA published its revised Guideline on Authorization of Virtual Banks which sets out specific criteria that HKMA considers when deciding whether to authorize a digital/virtual bank. The guideline builds on HKMA's New Era of Smart Banking strategy.

#### Major FinTech Foundational Regulations and Frameworks

- **Amendments to the Personal Data (Privacy) Ordinance (PDPO):** The PDPO, which is Hong Kong's main legislation on data privacy protection, was amended in 2012 and again in 2021. The 2012 amendments introduced major updates to the ordinance including a new regime governing the use and provision of personal data in direct marketing. The 2021 amendment introduced offences, investigative power, and enforcement actions against the disclosure of personal data without consent on the internet, i.e. doxing.
- **Consumer protection frameworks:** The HKMA has introduced several frameworks to ensure consumer protection for financial services, such as Promoting Fair Treatment of Customers, Enhancing Disclosure and Transparency, Promoting Financial Consumer Education, Enhancing Protection of Consumer Data and Privacy, Enhancing Investor Protection, Enhanced Deposit Protection, and Participation in International Forums on Enhancing Financial Consumer Protection

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 7
- **Number of digital transactions per adult:** N/A\*
- **Total number of adults (age 15-64):** N/A\*

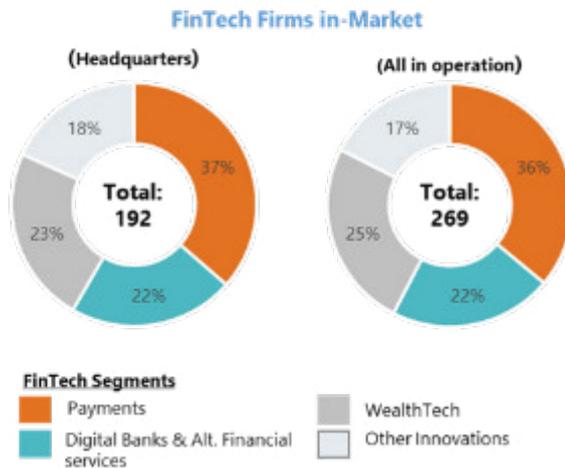
\*Insufficient data for analysis

Sources: Hong Kong Monetary Authority, Office of the Privacy Commissioner for Personal Data, Pitchbook

# INDONESIA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders



### Top 5 FinTech Companies: by capital raised

1. GoJek
2. Elang Mahkota Technologies
3. Xendit
4. Akulaku
5. Ajaib

### Major Industry Stakeholders

- **Regulator:** Bank Indonesia (BI), Otoritas Jasa Keuangan (OJK)
- **Industry Association:** Asosiasi FinTech Indonesia (AFTECH), Indonesian Chamber of Commerce (Kadin)
- **Innovation Hub/ Regulatory Sandbox:** OJK Innovation Centre for Digital Financial Technology (OJK Infinity), Bank Indonesia Regulatory Sandbox

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

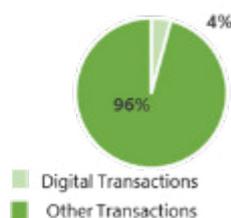
- **Regulatory Sandboxes:** The OJK and BI sandboxes, meant for FinTechs and specifically payment FinTechs, respectively, offer six months to one-year exemptions from activity restrictions. These sandboxes have respectively been in operation since 2017 and 2018.
- **Digital Bank Licenses:** OJK regulation No. 12/POJK.03/2021 introduces an internet-only bank framework to the existing banking regulation. Seven banks have been issued licenses, and foreign ownership of up to 99% is permitted, subject to certain single ownership limits.
- **FinTech Cooperation Agreements:** OJK has established several FinTech cooperation agreements with counterparts from Japan, Malaysia, Australia and Singapore in the past five years. These agreements typically aim to strengthen efforts in exchanging information on emerging FinTech market trends, promote joint innovation projects, and align on regulatory requirements to allow FinTech companies from either markets to enter the other.

#### Major Foundational Regulations and Frameworks

- **Draft Personal Data Protection Law:** Indonesia has been working towards a comprehensive data protection act that would update, strengthen, and streamline existing regulations on personal data
- **New Consumer Protection Regulation:** In May 2022, OJK issued Regulation No. 6/POJK.07/2022 on Consumer and Public Protection in the Financial Services Sector. The regulation amends a previous regulation and clarifies disclosure and transparency obligations regarding financial services and product information and enhances consumer data and information protection. The new regulation is part of OJK's efforts to strengthen consumer and public protection in the financial services to ensure a stable financial sector.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 4.31
- **Number of digital transactions per adult:** 75
- **Total number of adults (age 15-64):** 186,082,757

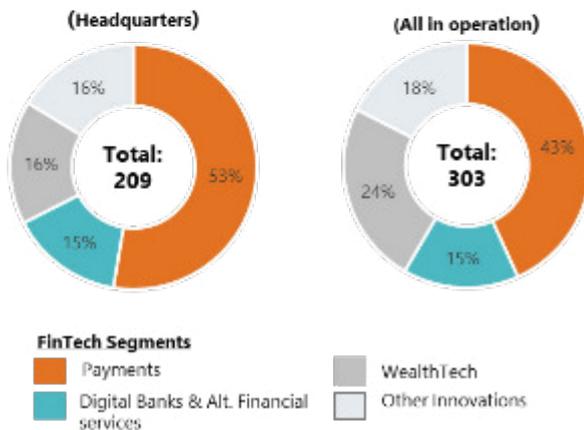
Source: Bank Indonesia, BakerMcKenzie, Global Compliance News, KR Asia, Mondaq, Otoritas Jasa Keuangan, Pitchbook, Securities Commission Malaysia

# JAPAN

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. PayPay
2. Paidy
3. LINE Securities
4. Yayoi
5. Rakuten (Internet Retail)

#### Major Industry Stakeholders

- **Regulator:** Financial Services Agency of Japan (FSA); Bank of Japan
- **Industry Association:** FinTech Association of Japan
- **Others:** FSA FinTech Innovation Hub, FSA FinTech Summit

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

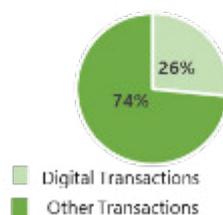
- **Amendments to Payment Services Act:** Amendments to the Act which took effect in May 2021 removed the numerical transfer cap placed on fund transfer services by non-bank financial institutions to encourage the use of cashless payments. The amendment provides greater flexibility to non-bank payment service providers by establishing multiple license/ registration levels that depend on the size and scope of the payment service provider's operations.
- **Amendments to the Banking Act:** The FSA amended the Banking Act in 2017 and 2018 to promote open APIs in the finance industry. Banks are obliged to publish their Open API policies and must affiliate with a third-party provider to offer this service. Data portability remains voluntary.
- **Regulation on StableCoins:** In June 2022, the Upper House of Japan's parliament passed a bill to regulate StableCoins. The new law is aimed at curbing financial system risks posed by StableCoins and to strengthen investor protection.
- **Act on the Provision of Financial Services:** In October 2021, Japan introduced a new licensing regime that allows businesses to distribute financial products and services of banking, securities, insurance, and money lending with a single license. The revised act aims to reduce the regulatory and licensing complexity for such services and make Japan a more attractive market for FinTech companies.

#### Major Foundational Regulations and Frameworks

- **Amendments to the Act on the Protection of Personal Information (APPI):** Amendments to the APPI, which came into effect on 1 April 2022 saw, among others, more stringent definitions of consent for the purpose of data storage and processing and clarified reporting obligations on data breaches to the Personal Information Protection Commission.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

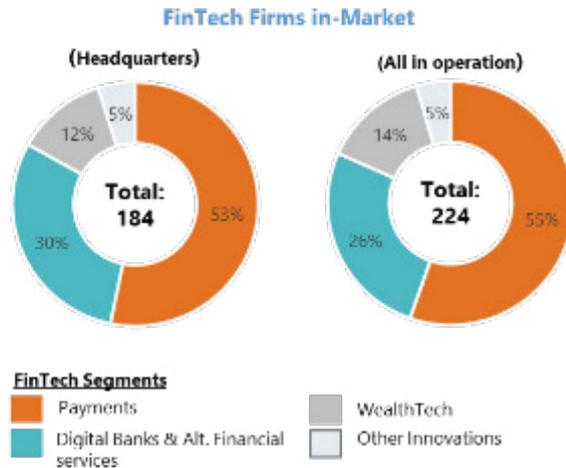
- **Average value of digital transaction:** US\$ 25.13
- **Number of digital transactions per adult:** 136
- **Total number of adults (age 15-64):** 74,280,792

Source: ACI Worldwide, Bank of Japan, Bank for International Settlements, BakerMckenzie, DLA Piper, Mondaq, Nikkei Asia, Pitchbook

# REPUBLIC OF KOREA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders



### Top 5 FinTech Companies; by capital raised

1. Kakao Pay
2. K Bank
3. Toss
4. Dunamu
5. Bithumb

### Major Industry Stakeholders

- **Regulator:** Financial Services Commission (FSC), Financial Supervisory Service (FSS)
- **Industry Associations:** Korea FinTech Industry Association (Korfin), FinTech Center Korea, Korea Federation of Banks
- **Innovation Facilitator:** Seoul FinTech Lab

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

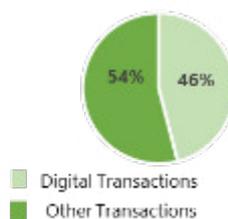
- **Amendments to Electronic Financial Transaction Act:** Proposed amendments to the EFTA aim to consolidate and streamline current licensing regime, improve customer protection systems, institutionalise open banking and digital clearing, and enhance financial security systems.
- **Internet-only Bank Act:** In effect since January 2019, the Internet-only Bank Act provides exemptions and relaxation of certain requirements under the Banking Act, such as minimum capital requirements, and higher non-financial shareholding limit, to encourage development and adoption of internet-only banks.
- **Open Banking Initiative:** In February 2019, FSC introduced its open banking initiative which grants FinTech firms access to banks' payment network and includes six open APIs offering access to core banking services, such as account balance, transaction history, account holder's real name, remitter's information, debit transfer, and credit transfer.

#### Major Foundational Regulations and Frameworks

- **Financial Consumer Protection Act (2021):** In March 2021, the government of Korea introduced a new legislation on financial consumer protection with the goal of improving fairness in the economy, enhancing the rights of financial consumers, and creating a more level playing field and strengthen the overall public confidence in the financial industry.
- **AML guidelines on virtual assets:** In January 2018, the Korea Financial Intelligence Unit published a set of guidelines that require enhanced due diligence from financial institutions when dealing with a virtual asset service provider (VASP), provide details on specific types of suspicious transactions using virtual assets, and requirements for financial institutions to strengthen internal controls and share information on VASP with other relevant institutions to enhance AML/CTF efforts.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** USD 8.47
- **Number of digital transactions per adult:** 497
- **Total number of adults (age 15-64):** 37,494,422

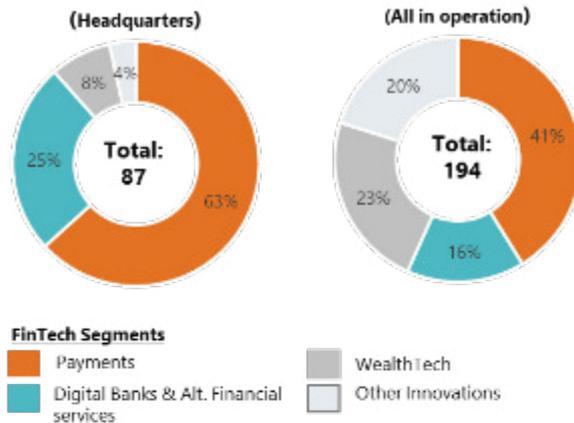
Sources: ACI Worldwide, Bank of Korea ECOS, Korea Financial Services Commission, Korea Financial Intelligence Unit, PitchBook

# MALAYSIA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. MOL Global
2. TNG Digital
3. Fave
4. Jirnexu
5. CapBay

#### Major Industry Stakeholders

- **Regulator:** Bank Negara Malaysia (BNM), Securities Commission of Malaysia (SC)
- **Government-Backed Venture Fund:** Cradle Fund Sdn Bhd
- **Industry Association:** Malaysia FinTech Chamber of Commerce, FinTech Association of Malaysia

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

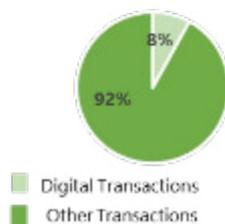
- **Guidelines on e-Money:** BNM issued an exposure draft on e-money in 2021, which outlines, among other issues, requirements to ensure the safety and reliability of e-money platforms, and permits non-bank financial institutions to issue e-money, as part of the central bank's effort to promote a cashless society.
- **Revised guidelines on new recognised markets:** The SC's Guidelines on Recognised Markets was revised several times in 2019 and 2020 to introduce new chapters on P2P lending and equity crowdfunding. The SC has also introduced a handbook for digital investment managers which sets out licensing and conduct requirements when offering automated discretionary portfolio management services.
- **AML/CTF policies on digital currencies:** BNM issued the AML/CTF-Digital Currencies policy document in 2018 to regulate the exchange and provision of digital currencies in Malaysia.

#### Major Foundational Regulations and Frameworks

- **Personal Data Protection Act (2013):** The PDPA came into force in 2013 and regulates the collection, use, processing, and disclosure of personal data in respect to commercial transactions, including activities related to finance, investment, banking, and insurance, but does not include credit reporting business as defined under the Credit Reporting Agencies Act 2010.
- **e-KYC framework:** In June 2020, BNM issued its policy document on e-KYC, to enable end-to-end offering of digital financial services and foster greater innovation in the financial sector.
- **Fair Treatment of Financial Consumers:** In 2019, BNM published a policy document on the Fair Treatment of Financial Consumers to ensure responsible conduct by regulated financial service providers, promote fair treatment of financial consumers, and foster consumer trust in financial service providers.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 6.98
- **Number of digital transactions per adult:** 83
- **Total number of adults (age 15-64):** 22,560,791

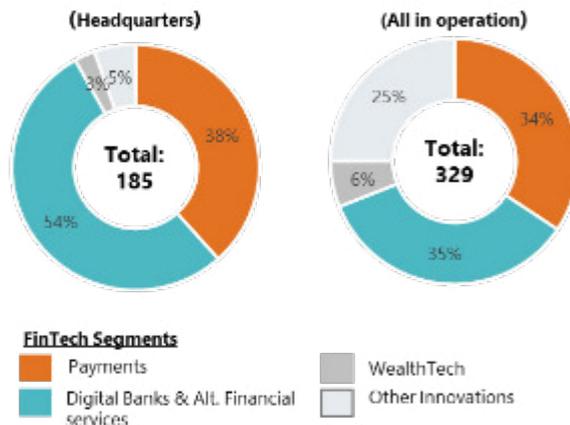
Sources: ACI Worldwide, Bank Negara Malaysia, Global Legal Insights, ICLG, Pitchbook, Securities Commission Malaysia

# MEXICO

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. Konfio
2. Clip
3. Kueski
4. Bitso
5. Stori

#### Major Industry Stakeholders

- **Regulator:** National Banking and Securities Commission (CNBV), Central Bank of Mexico (Banxico), National Commission for the Protection of Users of Financial Services (CONDUSEF), Institute for the Protection of Banking Savings (IPAB) FinTech
- **Industry Association:** FinTech Mexico, Finnovista
- **FinTech events:** Finnosummit Mexico, LendIt FinTech

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

- **Law to Regulate Financial Technology Institutions:** The 2018 FinTech Law sets the stage for FinTech services like open banking, big data analytics, crowdfunding, cryptocurrency, e-money, robo-advisory, and regulatory sandboxes. It also established a regulatory sandbox administered by CNBV,
- **Regulatory framework on virtual assets:** In 2018, Banxico published Circular 4/2019 which defines the characteristics of virtual assets with which institutions may operate, and establishes the terms, conditions, and restrictions applicable to the transactions which financial institutions may carry out with regards to virtual assets.
- **Cobro Digital (CoDi):** In 2019, Banxico launched CoDi, a digital payment platform designed to allow users to make payments initiated by QR-codes through their smartphones in an effort to increase the use of non-cash payments. Adoption rate for CoDi since its launch has been slow, with some media observer citing a lack of consumer awareness and limited participation by local banks.

#### Major FinTech Foundational Regulations and Frameworks

- **Federal Law for the Protection of Personal Data in the Possession of Private Parties (LFPDPPP):** The LFPDPPP plus supplementary laws provide a baseline standard of protection for personal data in Mexico, offering clear definitions and classifications, as well as consent and breach requirements.
- **Tiered Customer Due Diligence Approach for Account Opening:** In 2011, Mexico introduced a four-tiered scheme for opening transactional deposit accounts for individuals offered by financial institutions. The scheme sought to provide some flexibility on account opening, particularly for low-value, low-risk accounts, to improve financial inclusion. The level of customer due diligence requirements and monitoring increases with higher transaction limits.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

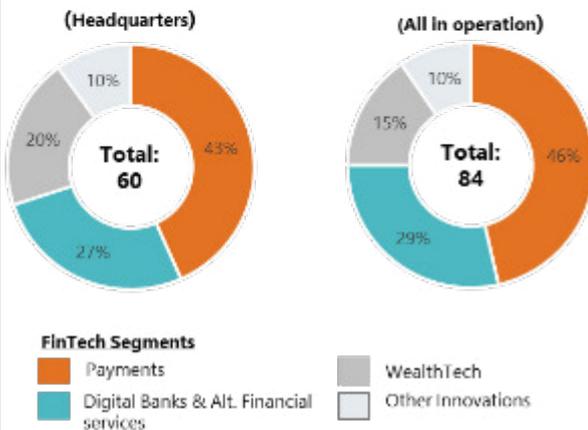
- **Average value of digital transaction:** US\$ 26.23
- **Number of digital transactions per adult:** 23
- **Total number of adults (age 15-64):** 86,064,946

Sources: ACI Worldwide, Bank for International Settlements, Banco de Mexico, BakerMckenzie, Centre for Global Development, Deloitte, GSMA, Pitchbook

# NEW ZEALAND FinTech Landscape

## FinTech Innovation and Key Stakeholders

### FinTech Firms in-Market



### Top 5 FinTech Companies; by capital raised

1. Xero
2. Harmony
3. Pushpay
4. Sharesies
5. First AML

### Major Industry Stakeholders

- **Regulator:** Ministry of Business, Innovation, and Employment (MBIE), Financial Markets Authority New Zealand (FMA), Reserve Bank of New Zealand, Commerce Commission (ComCom), Council of Financial Regulators (CoFR)
- **Industry Association:** FintechNZ, Payments NZ, BlockchainNZ, NZTech, Business NZ, New Zealand Tech Alliance
- **Government-led Innovation Facilitators:** Callaghan Innovation

## FinTech Policies and Regulations in APEC

### Major Enabling Policies and Regulations

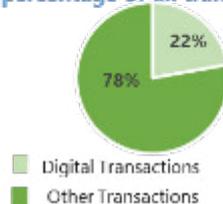
- **Retail Payment System Act 2022:** The Act establishes a new regulatory regime to govern New Zealand's retail payment systems and entities involved in retail payment systems, with the aim of promoting competition and efficiency. The Act also conferred certain functions and powers to the Commerce Commission for the purpose of enforcing regulations, including regulating fees charged by merchants in respect of certain payment services.
- **Financial Service Legislation Amendment Act:** The Act, which came into force in March 2021, establishes a new regulatory regime for financial advice to improve access to high quality financial advice and create a regime which establishes a level playing field for providers of financial advice. Notably, the Act removed the requirement that advice is to be given by a natural person, thereby enabling the provision of robo-advice.
- **Updates to tax code to account for Crypto Assets:** New Zealand's Inland Revenue updated its guidance on the tax treatment of crypto assets as property in 2020 to help clarify the application of tax rules for businesses or individuals buying, selling, trading, or mining crypto assets.

### Major Foundational Regulations and Frameworks

- **The Privacy Act 2020:** The Act repeals and replaces the Privacy Act of 1993. The Act introduces several key changes, including explicit extraterritorial obligations when sending personal information overseas, data breach notification obligations, new criminal offences on misuse of personal data, heightened powers for the Privacy Commissioner, as well as a move towards adequacy status with the EU's GDPR and recent changes to Australia's privacy laws.
- **Cyber Security Strategy 2019:** New Zealand introduced a national cybersecurity strategy in 2019 to outline areas the Government will prioritise and builds on previous strategies. The five areas include, cybersecurity aware and active citizens, strong and capable cybersecurity workforce and ecosystem, internationally activity, resilient and responsive, and proactively tackle cybercrime.

## Sizing the FinTech Opportunity

### Share of Digital Transactions as a percentage of all transactions



### Other Key Figures

- **Average value of digital transaction:** US\$ 7.18
- **Number of digital transactions per adult:** 344
- **Total number of adults (age 15-64):** 3,246,009

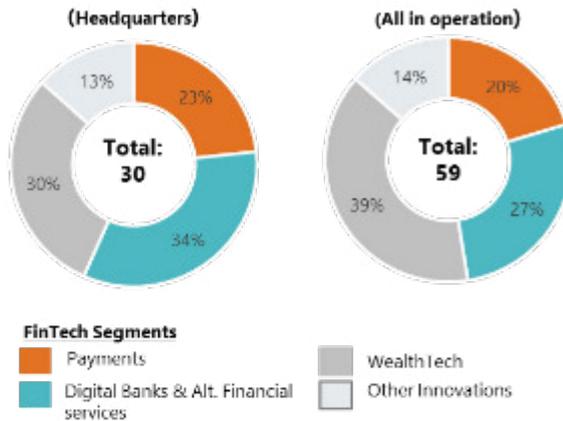
Sources: EY, Pitchbook, Ministry of Business, Innovation and Employment, Stats NZ Tātauranga Aotearoa, Thomson Reuters

# PERU

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. RedCapital
2. GTV GlobokasNet
3. SeguroSimple.com
4. Hello ZUM
5. Rextie

#### Major Industry Stakeholders

- **Regulator:** Superintendencia of Banking, Insurance, and Pension Funds Administrators (SBS), Banco Central de Reserva del Peru (BCRP), Superintendency of the Securities Market (SMV), Secretariat of Digital Government
- **Industry Association:** Asociación Fintech del Perú
- **Innovation Program:** The Development Bank of Peru

### FinTech Policies and Regulations in APEC

#### Major FinTech Enabling Policies and Regulations

- **Circular on Electronic Money Payment Agreements:** Introduced in 2016, the Circular (No. 013-2016-BCRP) sets out definitions and procedures for financial and non-financial institutions to enter into electronic money payment agreements when managing transfers, payments and settlements of electronic money.
- **Emergency Decree on Crowdfunding Services:** Effective since April 2020, the Decree (No. 013-2020-JUS/DGTAIPD) regulates and supervises (i) crowdfunding activities (including equity and debt securities crowdfunding and P2P lending); and (ii) companies that are authorised to manage crowdfunding platforms.
- **FinTech Sandbox:** A regulatory sandbox for innovative FinTech business models under the supervision of SBS was established in February 2022 under SBS Resolution No. 2429-2021 to complement the existing regulatory framework to promote the financing of MSMEs.

#### Major FinTech Foundational Regulations and Frameworks

- **Data Protection Law:** The Law (Law 29733) recognizes specific rights of data subjects and obligations of those who are responsible for the processing of their data. It gives powers to a Data Protection Authority. Databases must be registered with the Authority, and a fee must be paid. It includes no restrictions on data flows.
- **New Digital Trust Framework:** The Framework, enacted with the approval of Emergency Decree No.007-2020 imposes several obligations on digital service providers, including the obligation to notify the data protection authority on any security breach involving personal data, and requirements related to the implementation of security measures when providing digital services.
- **Electronic domestic identity card:** Peru's electronic domestic ID card with chip information has been available since 2016. Recent approval of the Digital Government Law which accepts digital identity as a legal identification form is an important step for e-KYC and further digitization of financial services.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

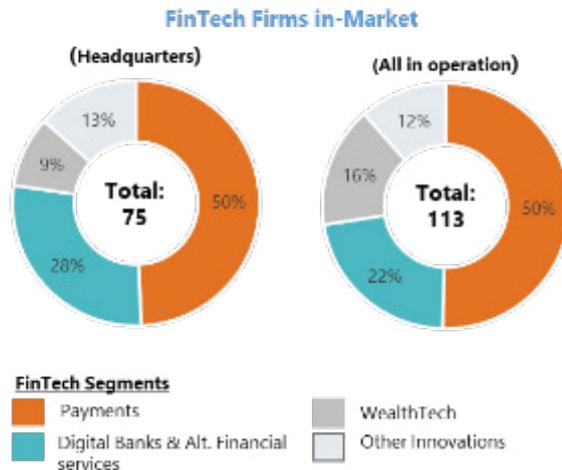
- **Average value of digital transaction:** US\$ 7.38
- **Number of digital transactions per adult:** 53
- **Total number of adults (age 15-64):** 21,944,297

Sources: ACI Worldwide, Alliance for Financial Inclusion, BakerMckenzie, Central Reserve Bank of Peru, cms-lawnow.com, fundacionmicrofinanzasbba.org, gamques.com, Pitchbook, Statista, World Development Indicators.

# PHILIPPINES

## FinTech Landscape

### FinTech Innovation and Key Stakeholders



### Top 5 FinTech Companies; by capital raised

1. Voyager Innovations
2. Mynt
3. PDAX
4. PayMongo
5. BillEase

### Major Industry Stakeholders

- **Regulator:** Bangko Sentral ng Pilipinas (BSP), Philippines Securities and Exchange Commission (PSEC)
- **Industry Association:** FinTech Philippines Association, FinTech Alliance Philippines
- **International Organisation:** Asian Development Bank, World Bank, ASEAN

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

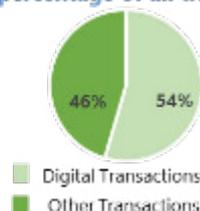
- **A bill for digital payments:** In May 2022, the Philippines Senate filed an Act Promoting the Adoption of Digital Payments for Financial Transactions of the Government and All Merchants and for Other Purposes. The bill aims to promote the use of safe, affordable, and efficient digital payments by the government and the public, and will see the Department of Information and Communications Technology, and the National Privacy Commission work in consultation with BSP to prescribe information security standards and compliance requirements for information used by payment service providers.
- **Digital Payments Transformation Roadmap 2020-2023:** The Roadmap was introduced by BSP in 2020 to develop an efficient, inclusive, safe, and secure digital payments ecosystem, with the intention of growing digital payments use and encourage development of more innovative and responsive digital financial services.
- **Open Finance Roadmap 2021-2024:** BSP launched the open finance roadmap to encourage collaborative engagement with the private sector through the establishment of the Open Finance Oversight Committee. It also outlines priorities such as improving capacities among regulators and creating a regulatory framework.

#### Major Foundational Regulations and Frameworks

- **Financial Consumer Protection Framework (2020):** The Framework designates BSP as the responsible agency for establishing consumer protection regulations for financial services. Regulations cover common risks and consumer rights on disclosure, transparency, client information protection, fair treatment and effective recourse.
- **Philippines National Computer Emergency Response Team (NCERT):** NCERT is the highest body for cybersecurity related activities in the Philippines and was established in 2020 as part of the Department of Information and Communications Technology effort to implement the National Cybersecurity Plan 2022.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

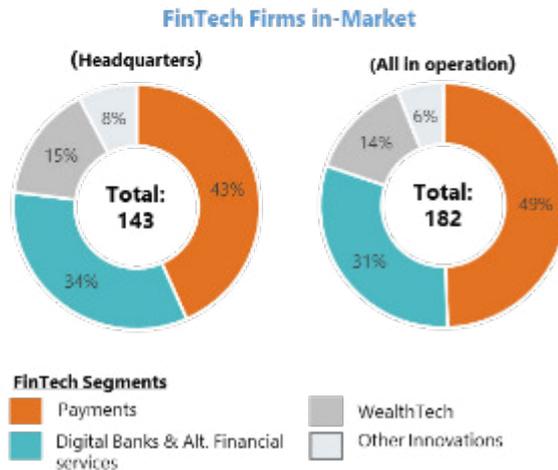
- **Average value of digital transaction** : US\$ 0.41
- **Number of digital transactions per adult** : 738
- **Total number of adults (age 15-64)** : 70,802,303

Sources: ACI Worldwide, Better than Cash Alliance, Bangko Sentral ng Pilipinas, dataguidance.com, Department of Information and Communications Technology, National Computer Emergency Response Team of Philippines, paypers.com, Pitchbook

# RUSSIA

## FinTech Landscape

### FinTech Innovation and Key Stakeholders



### Top 5 FinTech Companies; by capital raised

1. Tinkoff Bank
2. Dengi Vpered
3. QIWI
4. Sovcombank
5. SFI Investment Holding

### Major Industry Stakeholders

- **Regulator:** Central Bank of Russia (CBR), Ministry of Finance
- **Industry Association:** Russian Fintech Association
- **FinTech Partnership Programmes:** JSC Sberbank and Alfa Bank

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

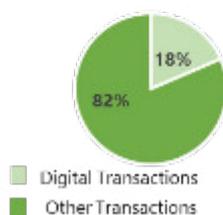
- **Federal law on crowdfunding:** The law (Federal Law No. 259-FZ on Raising Investments via Investment Platforms and on the Amendments to Certain Legislative Act of the Russian Federation dated 2 August 2019) came into effect on 1 January 2020 and regulates all crowdfunding and crowdlending activities in Russia. The law defines the term investment platform and provides three options for raising money through it, including P2P lending, equity crowdfunding, and utility tokens. The law also sets investment caps for a single individual and requires platforms to register with the central bank.
- **Federal law on digital financial assets and currencies:** The law (Federal Law No. 259-FZ on Digital Financial Assets, Digital Currency, and on the Introduction of Amendments to Certain Legislative Acts of the Russian Federation dated 31 July 2020) came into effect on 1 January 2021 and regulates the issuance and circulation of digital financial assets and digital currencies. Among other things, the law introduces a definition to digital currency and requires notification of ownership.
- **Central Bank regulatory sandbox for FinTech:** In 2018, CBR launched a FinTech regulatory sandbox to pilot innovative financial technologies and services. High priority pilot projects include big data and machine learning, artificial intelligence, biometric technologies, distributed ledger technologies, open interface solutions, among others.

#### Major Foundational Regulations and Frameworks

- **Additional cybersecurity requirements for critical data infrastructures (CDI):** A law introducing specific security regulations for CDI facilities in important sectors of the Russian economy came into effect in January 2018. Owners of CDI facilities will have to comply with additional security and cybersecurity requirements and cooperate with government agencies in preventing and investigating cyber-incidents.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 1.92
- **Number of digital transactions per adult:** 184
- **Total number of adults (age 15-64):** 95,705,367

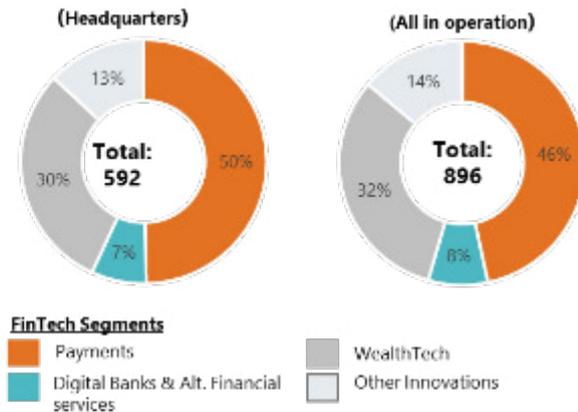
Sources: Allen & Overy, Bank for International Settlements, Central Bank of Russia, Clifford Chance, Pitchbook, Practical Law (Thomson Reuters)

# SINGAPORE

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. Grab
2. Coda Payments
3. Atome
4. Funding Societies
5. Amber Group

#### Major Industry Stakeholders

- **Regulator:** Monetary Authority of Singapore (MAS), GovTech, Smart Nation Digital Government Office (SNDGO)
- **Industry Association:** Association of Banks Singapore (ABS), Singapore Business Federation (SBF)
- **International Organisation/ Multilateral platform:** BIS Innovation Hub

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

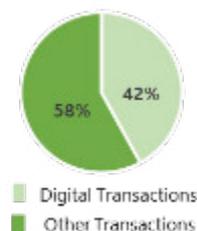
- **Payment Services Act (2020):** The Act streamlined previous legislative regimes by combining the Payment Systems (Oversight) Act and the Money Changing and Remittance Businesses Act. The new act also expanded the scope to include 7 new types of regulated payment services.
- **Digital Bank Licenses:** Four licenses for digital banks were awarded in December 2020 by MAS, with successful applicants including non-traditional FinTech players such as telecommunications and technology companies.
- **Digital Economy Agreements:** Singapore has concluded DEA with various APEC economies, including Australia, Chile, and Korea. Specific areas of collaboration include aligning rules and standards and facilitating interoperability between digital systems, supporting cross-border data flows and consumer rights, and encouraging nascent areas like digital identities and artificial intelligence.

#### Major Foundational Regulations and Frameworks

- **Personal Data Protection Act (2012):** The PDPA provides a baseline standard of protection for personal data in Singapore, and complements sector-specific legislative and regulatory framework like the Banking and Insurance Act. The PDPA also established the Personal Data Protection Commission.
- **Trusted Data Sharing Framework:** The framework aims to help companies establish a 'common data sharing language' and systematic approach to understanding the broad considerations for establishing trusted data sharing partnership.
- **Cybersecurity Act (2018):** A comprehensive law that outlines measures to prevent, manage, and respond to cybersecurity threats and incidents, and to identify and regulate owners of critical information infrastructure.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** USD 4.20
- **Number of digital transactions per adult:** 531
- **Total number of adults aged 15-64:** 4,327,555

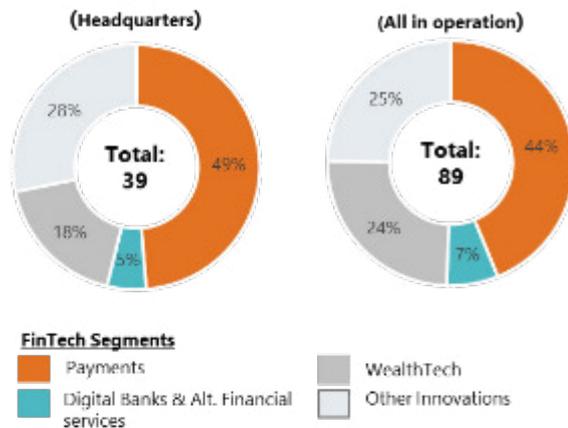
Sources: ACI Worldwide, Bank for International Settlements, Cash Essentials, Monetary Authority of Singapore, Pitchbook, SingaporeStatutes Online

# CHINESE TAIPEI

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. WOO Network
2. CoolBITX
3. XREX
4. BitoEx
5. Kronos Research

#### Major Industry Stakeholders

- **Regulator:** Financial Supervisory Commission (FSC)
- **Industry Association:** Taiwan FinTech Association, FinTech Industry Development Association, Taiwan Financial Services Roundtable
- **Others:** FinTech Space Innovation Lab, Taiwan Academy of Banking and Finance

### FinTech Policies and Regulations in APEC

#### Major Enabling Policies and Regulations

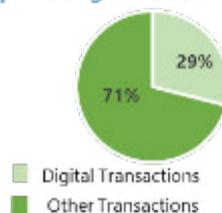
- **FSC Guidelines for Data Sharing between Financial Institutions (2021):** In response to the needs of FinTech development, the FSC published the "Guideline on Data Sharing among Financial Institutions," which allows financial institutions to share customer data for risk identification and management, as well as for facilitating operation and business cooperation under the prerequisite of customers' consent.
- **FinTech Development Roadmap (2020):** To cultivate a friendly ecosystem to facilitate the provision of FinTech services or innovative business models for better efficiency, accessibility, usability, and quality of financial services, the FSC rolled out the "FinTech Development Roadmap", as the basis for policy implementation for the year 2021-2023.
- **Financial Technology Development and Innovative Experimentation Act (2018):** The Act established a FinTech regulatory sandbox, overseen by the FSC, to facilitate the development of inclusive financial systems and technologies, while ensuring appropriate protection for consumers and innovators.
- **Internet-only Bank Licenses:** The FSC has granted three licenses to date with the first in 2019. While Internet-only Banks cannot operate physical branches, they are subject to many of the same regulations as brick-and-mortar banks, including minimum paid-up capital requirements.
- **Phased-approach to Open Banking:** The FSC adopts a three-phase approach to establishing an open banking ecosystem, with each phase increasing access to information. Phase 1 allowed consumers and third-party service providers (TSPs) to access public banking information, while Phase 2 allows consumers to share with consent certain financial information with TSPs. Phase 3 will allow consumers to access transaction information inquiry, enabling customers to conduct banking transactions.

#### Major Foundational Regulations and Frameworks

- **Personal Data Protection Act:** The Act was introduced in 2015 to regulate the collection, processing, and use of personal data to prevent harm on personality rights.
- **Financial Consumer Protection Act:** The Act, amended in 2016, sets out consumer protection principles in the finance industry, relating to dispute management and obligation to protect financial consumers.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



#### Other Key Figures

- **Average value of digital transaction:** US\$ 18.65
- **Number of digital transactions per adult:** 119
- **Total number of adults (age 15-64):** 16,479,912

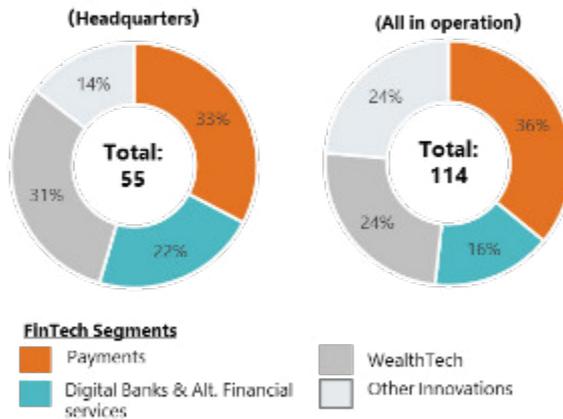
Source: ACI Worldwide, Data.Gov.Tw, Electronic Payments International (2019), Financial Supervisory Commission, Ministry of Justice, Pitchbook

# THAILAND

## FinTech Landscape

FinTech Innovation and Key Stakeholders

### FinTech Firms in-Market



### Top 5 FinTech Companies; by capital raised

1. SYNQA
2. Ascend Group
3. Xspring Capital
4. Sabuy Technology Co.
5. Rabbit Care

### Major Industry Stakeholders

- **Regulator:** Bank of Thailand (BoT), Securities and Exchange Commission, Capital Markets Supervisory Board, Digital Economy Promotion Agency
- **Industry Association:** Thai Chamber of Commerce, Thai Fintech Association
- **Accelerator Programme:** Bangkok Bank InnoHub

FinTech Policies and Regulations in APEC

### Major FinTech Enabling Policies and Regulations

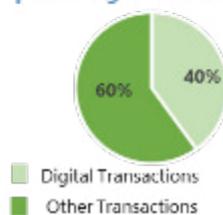
- **Payment Services Act:** The Act was drafted to enhance oversight and supervision of payment systems and services to be in line with international standards, thus ensuring greater efficiency, safety, security, and public confidence. The Act was drafted in 2017 and came into effect in 2018.
- **BOT Notification on P2P and Marketplace Lending:** In April 2019, BOT issued notification 4/2562 on P2P and marketplace lending which provides a number of parameters within which P2P platform providers and lenders must operate.
- **Decree on Digital Asset Business:** The Emergency Decree on Digital Asset Business (B.E.2561) was issued in 2018 and specifies the offerings provided by digital assets (e.g. digital token, cryptocurrencies, issuer, portal) and digital asset businesses (e.g. exchanges, broker, dealer, fund manager, and advisor). The decree also identifies the SEC as the authority responsible for the supervision and monitoring of the issuance and offering of digital tokens, and the undertaking of digital asset businesses.

### Major FinTech Foundational Regulations and Frameworks

- **Personal Data Protection Act (2019):** The PDPA came into force in mid-2022 after several years of delay. The newly effected PDPA adopts elements of the GDPR on issues like data processing, collection, and storage, but takes into account local perspectives such as on consent. Inform and request data owners on the collection, use, and disclosure of personal information.
- **Cybersecurity Act (2019):** A comprehensive law that outlines measures to prevent, manage, and respond to cybersecurity threat, and was amended in 2022 to regulate critical digital infrastructure. Cybersecurity intelligence and responses are handled by the National Cyber Security Agency (NCSA), which was established in 2021.
- **E-KYC and use of biometrics for digital and mobile banking:** in August 2019, BOT issued Notification FPG 19/2562, which allows the use of electronic identification data (including biometric comparison technology) and documents for identity verification when opening a deposit account with a financial institutions.

Sizing the FinTech Opportunity

### Share of Digital Transactions as a percentage of all transactions



### Other Key Figures

- **Average value of digital transaction:** US\$ 1.68
- **Number of digital transactions per adult:** 318
- **Total number of adults (age 15-64):** 49,380,641

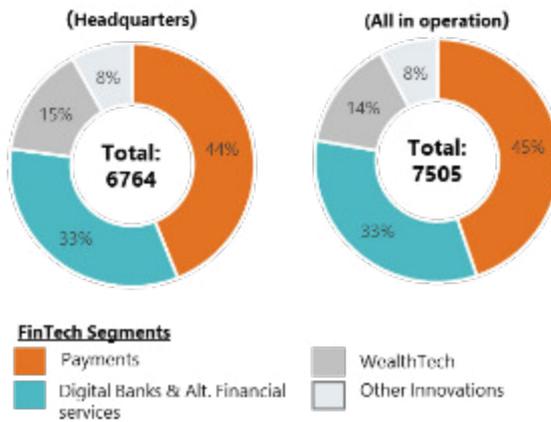
Sources: ACI Worldwide, Bank of Thailand, Bangkok Bank InnoHub, Bangkok Post, Global Legal Insights, Pitchbook, Lexology, Securities and Exchange of Thailand

# UNITED STATES

## FinTech Landscape

### FinTech Innovation and Key Stakeholders

#### FinTech Firms in-Market



#### Top 5 FinTech Companies; by capital raised

1. Kiddie Kredit
2. Interncontinental Exchange
3. VISA
4. First Data
5. Robinhood Markets

#### Major Industry Stakeholders

- **Regulator:** Federal Reserve, Securities and Exchange Commission (SEC), Consumer Financial Protection Bureau (CFPB), Office of the Comptroller of Currency (OCC), National Credit Union Administration, Commodity Futures Trading Commission (CFTC), Federal Deposit Insurance Corporation (FDIC)
- **Government-led innovation facilitators:** FinHub (SEC), Office of Innovation (CFPB), LabCTFC (CTFC), New York Innovation Centre (Federal Reserve System and the BIS Innovation Hub)

### FinTech Policies and Regulations in APEC

#### Major FinTech Enabling Policies and Regulations

- **Regulatory regime for payments:** Laws governing payment services are present at the federal and state level, with the different levels having distinct objectives. For instance, state laws governing electronic fund transfers (EFTs) and other payment methods largely conform to the statutory Uniform Commercial Code (UCC), which establishes EFTs rules that govern contractual interpretation and counterparty liability. Federal laws governing EFTs, such as the Electronic Fund Transfer Act and the Dodd-Frank Wall Street Reform and Consumer Protection Act, focuses on consumer protection.
- **Regulatory framework to support crowdfunding:** The Jumpstart our Business Startups Act (JOBS Act) was enacted in 2012 to support start-ups and reduce the compliance requirements of platform operators and securities issuers while protecting investors. The Act established, among others, a new type of internet-based intermediary to offer securities.
- **Potential new rules for open banking:** Since 2021, the CFPB has been responsible for drafting new rules that would effectively allow open banking solutions in the US, with the aim of giving consumers more power to share their financial data and make it easier to switch providers.

#### Major FinTech Foundational Regulations and Frameworks

- **Data privacy legislations:** Relevant federal laws on consumer data privacy include the Fair Credit Reporting Act (1970), Right to Financial Privacy Act (1978) and the Gramm-Leach-Bliley Act (1999). States have the authority to introduce greater consumer information privacy right. For example, the California Consumer Privacy Act establishes data processing requirements for banks, non-banks, and merchants.
- **Strengthening American Cybersecurity Act (2022):** The Act was passed unanimously on 1 March 2022 and aims to bolster the country's cyber defences. Notably, the Act sets out new reporting requirements for critical infrastructure entities and civilian federal agencies when a substantial cyber incident or a ransomware payment has occurred. The Act also requires entities to preserve data relevant to the cyber incident or ransom payment.

### Sizing the FinTech Opportunity

#### Share of Digital Transactions as a percentage of all transactions



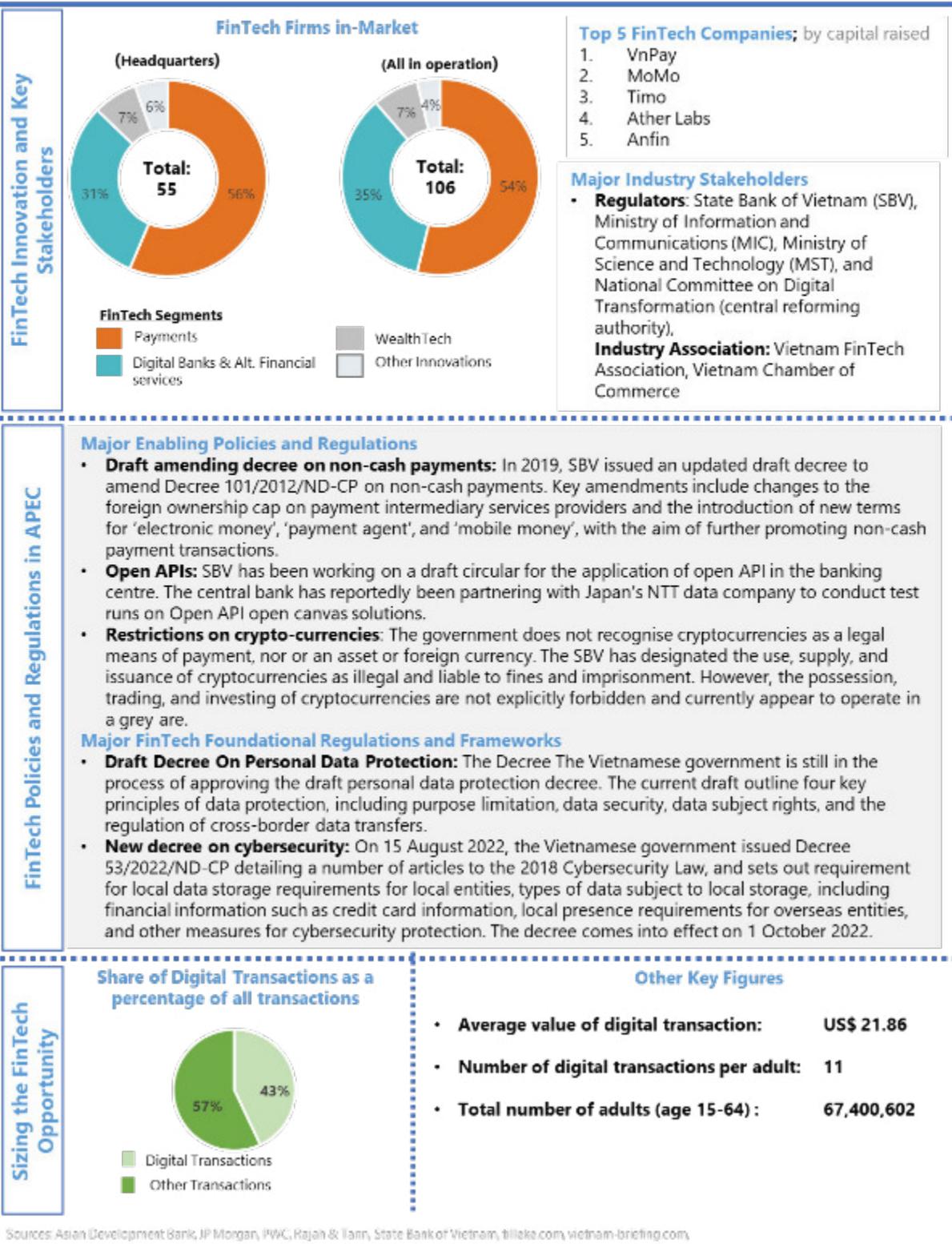
#### Other Key Figures

- **Average value of digital transaction:** **US\$ 12.34**
- **Number of digital transactions per adult:** **399**
- **Total number of adults (age 15-64):** **215,059,874**

Sources: ACI Worldwide, Bank for International Settlements, DLA Piper, US Federal Reserve Legal500, Pitchbook, Practical Law (Thomson Reuters), PYMNTS, Statista, World Development Indicators.

# VIET NAM

## FinTech Landscape



FinTech Policies and Regulations in APEC

### Major Enabling Policies and Regulations

- **Draft amending decree on non-cash payments:** In 2019, SBV issued an updated draft decree to amend Decree 101/2012/ND-CP on non-cash payments. Key amendments include changes to the foreign ownership cap on payment intermediary services providers and the introduction of new terms for 'electronic money', 'payment agent', and 'mobile money', with the aim of further promoting non-cash payment transactions.
- **Open APIs:** SBV has been working on a draft circular for the application of open API in the banking centre. The central bank has reportedly been partnering with Japan's NTT data company to conduct test runs on Open API open canvas solutions.
- **Restrictions on crypto-currencies:** The government does not recognise cryptocurrencies as a legal means of payment, nor as an asset or foreign currency. The SBV has designated the use, supply, and issuance of cryptocurrencies as illegal and liable to fines and imprisonment. However, the possession, trading, and investing of cryptocurrencies are not explicitly forbidden and currently appear to operate in a grey area.

### Major FinTech Foundational Regulations and Frameworks

- **Draft Decree On Personal Data Protection:** The Decree The Vietnamese government is still in the process of approving the draft personal data protection decree. The current draft outline four key principles of data protection, including purpose limitation, data security, data subject rights, and the regulation of cross-border data transfers.
- **New decree on cybersecurity:** On 15 August 2022, the Vietnamese government issued Decree 53/2022/ND-CP detailing a number of articles to the 2018 Cybersecurity Law, and sets out requirement for local data storage requirements for local entities, types of data subject to local storage, including financial information such as credit card information, local presence requirements for overseas entities, and other measures for cybersecurity protection. The decree comes into effect on 1 October 2022.

Sizing the FinTech Opportunity

### Share of Digital Transactions as a percentage of all transactions

■ Digital Transactions

■ Other Transactions

### Other Key Figures

- **Average value of digital transaction:** US\$ 21.86
- **Number of digital transactions per adult:** 11
- **Total number of adults (age 15-64) :** 67,400,602

## Appendix II. Economic Impact Methodology

### Sizing the Volume and Average Value of Digital Transactions in APEC

To understand the impact of digital payments and FinTech on APEC economies, it is essential to understand the extent to which digital payments have been adopted. A sizing exercise was conducted to estimate the number of digital transactions in each APEC economy and the number of digital transactions across the APEC region, including cross-border transactions.

**Digital transactions were defined as transactions that take place via digital or online channels, excluding card transactions.** The sources used for the sizing are in Table 4 below.<sup>214</sup> For the average value of digital transactions, we used ACI’s “Prime Time for Real-Time Global Payments Report,” the Bank for International Settlements’ Payments Dataset, and various central statistical agencies.<sup>215</sup>

**Table 4: Inputs for Calculating Total Volume of Digital Transactions in APEC Economies**

Economy	Source
Australia	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)<sup>216</sup></li> <li>• ACI Worldwide (2022)<sup>217</sup></li> <li>• Statista (2022)<sup>218</sup></li> <li>• Australian Payments Network<sup>219</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)<sup>220</sup></li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Reserve Bank of Australia (2016-2021)<sup>221</sup></li> </ul>
Canada	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> <li>• Statista (2022)<sup>222</sup></li> </ul>

<sup>214</sup> Where the 2021 data was not available, historical data was used to estimate the 2021 numbers.

<sup>215</sup> ACI Worldwide (2021) Prime Time for Real-Time Global Payments Report, <https://www.aciworldwide.com/real-time-payments-report>; and Bank for International Settlements (2022) BIS Statistics Explorer: Payments and financial market infrastructures, <https://stats.bis.org/statx/toc/CPMI.html>

<sup>216</sup> ACI Worldwide (2021) Prime Time for Real-Time Global Payments Report, <https://bankingfrontiers.com/wp-content/uploads/2021/04/2021-Prime-Time-Report.pdf>

<sup>217</sup> ACI Worldwide (2022) Prime Time for Real-Time Global Payments Report, <https://www.aciworldwide.com/real-time-payments-report>

<sup>218</sup> Statista (2022) Proportion of cash payment transactions in selected economies worldwide in 2017, <https://www.statista.com/statistics/1055618/cash-payment-transactions-by-country/>

<sup>219</sup> Australian Payments Network, Australia’s move towards a less cash economy, <https://www.auspaynet.com.au/insights/blog/lesscash#:~:text=In%202019%3A,compared%20with%2018%25%20in%20>

<sup>220</sup> Bank for International Settlement, Volume of cashless payments and withdrawal/deposit transactions, <https://stats.bis.org/statx/toc/CPMI.html>

<sup>221</sup> Reserve Bank of Australia (2016-2021) Credit and Charge Cards – Original Series – Aggregate Data”, and “Debit Cards – Original Series”, <https://www.rba.gov.au/payments-and-infrastructure/resources/payments-data.html>

<sup>222</sup> Statista (2022) Most used payment methods including consumer as well as business environment based on transaction volume in Canada in 2019, <https://www.statista.com/statistics/800881/volume-of-payment-transactions-by-payment-method-canada/>

Economy	Source
	<ul style="list-style-type: none"> <li>• Statista (2022)<sup>223</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Payments Canada (2020)<sup>224</sup></li> <li>• Payments Canada (2021)<sup>225</sup></li> </ul>
Chile	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Chilean Central Bank’s Payment System Studies<sup>226</sup></li> </ul>
People’s Republic of China	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> <li>• Statista (2022)<sup>227</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• The People's Bank of China (2021)<sup>228</sup></li> </ul>
Indonesia	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• Statista (2022)<sup>229</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> </ul>

<sup>223</sup> Statista (2022) Volume of transactions in Canada from 2001 to 2018, by type, <https://www.statista.com/statistics/798602/volume-of-transactions-canada-by-type/>

<sup>224</sup> Payments Canada (2020) Canadian payments: Methods and Trends 2020, [https://www.payments.ca/sites/default/files/paymentscanada\\_canadianpaymentsmethodsandtrendsreport\\_2020.pdf](https://www.payments.ca/sites/default/files/paymentscanada_canadianpaymentsmethodsandtrendsreport_2020.pdf)

<sup>225</sup> Payments Canada (2021) Canadian Payment Methods and Trends Report 2021, [https://www.payments.ca/sites/default/files/payments\\_canada\\_canadian\\_payment\\_methods\\_and\\_trends\\_report\\_2021.pdf](https://www.payments.ca/sites/default/files/payments_canada_canadian_payment_methods_and_trends_report_2021.pdf)

<sup>226</sup> Banco Central de Chile (2018) Evolucion de los Medios de Pago en Chile y su Incidencia en el Comportamiento de los Componentes de M1, <https://si2.bcentral.cl/public/pdf/estudios-economicos-estadisticos/pdf/see125.pdf>

<sup>227</sup> Statista (2022) Share of cash estimate at point of sale (POS) in China from 2012 to 2020, <https://www.statista.com/statistics/1306790/cash-use-in-china/>

<sup>228</sup> The People’s Bank of China (2021), Payment System Report (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4437084/4525787/2022040622295461615.pdf>

<sup>229</sup> Statista (2022) Estimated share of cash used in total transactions in the Asia Pacific region in 2020, by country, <https://www.statista.com/statistics/1176423/apac-share-of-cash-used-in-transactions-by-country/>

Economy	Source
	<p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2020)</li> <li>• Statista (2021)<sup>230</sup></li> </ul>
Japan	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> <li>• Statista (2022)<sup>231</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2020)</li> <li>• Bank of Japan<sup>232</sup></li> </ul>
Republic of Korea	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> <li>• Statista (2022)<sup>233</sup></li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Bank of Korea ECOS Economic Statistics System<sup>234</sup></li> </ul>
Malaysia	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Bank Negara Malaysia<sup>235</sup></li> </ul>

<sup>230</sup> Statista (2021) Number of credit card transactions in Indonesia from 2017 to June 2021, <https://www.statista.com/statistics/1254968/indonesia-credit-card-transaction-volume/#:~:text=In%202020%2C%20there%20were%20268.21,to%20the%20COVID%2D19%20crisis>

<sup>231</sup> Statista (2022) Ratio of cashless payments in Japan from 2011 to 2020, <https://www.statista.com/statistics/798602/volume-of-transactions-canada-by-type/>

<sup>232</sup> Bank of Japan, Payment and Settlement Statistics, <https://www.boj.or.jp/en/statistics/set/kess/release/2022/kess2203.pdf>

<sup>233</sup> Statista (2022) Proportion of cash payment transactions in selected economies worldwide in 2017, <https://www.statista.com/statistics/1055618/cash-payment-transactions-by-country/>

<sup>234</sup> Bank of Korea ECOS Economic Statistics System, Credit Card Statistics, <https://ecos.bok.or.kr/#/SearchStat>

<sup>235</sup> Bank Negara Malaysia, Electronic Payments: Volume and Value of Transactions, [https://www.bnm.gov.my/documents/20124/57659/02\\_epayment.xlsx/97aaefe6-bf1d-2ff8-bba2-c0669c8d07a7?t=1602068038276](https://www.bnm.gov.my/documents/20124/57659/02_epayment.xlsx/97aaefe6-bf1d-2ff8-bba2-c0669c8d07a7?t=1602068038276)

Economy	Source
Mexico	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2019)</li> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Bank for International Settlements (2016 – 2020)</li> </ul>
New Zealand	<p>Digital Transactions</p> <ul style="list-style-type: none"> <li>• Used Australia’s transactions as a proxy given similar economic structure, and scaled by relative population</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Stats NZ Tatauranga Aotearoa<sup>236</sup></li> </ul>
Peru	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Card-based transactions:</p> <ul style="list-style-type: none"> <li>• Central Reserve Bank of Peru<sup>237</sup></li> </ul>
Philippines	<p>Total number of transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Paperless transactions:</p> <ul style="list-style-type: none"> <li>• ACI Worldwide (2021)</li> <li>• ACI Worldwide (2022)</li> </ul> <p>Digital and non-digital transactions:</p> <ul style="list-style-type: none"> <li>• Better Than Cash Alliance (2019)<sup>238</sup></li> <li>• The Bangko Sentral ng Pilipinas (2021)<sup>239</sup></li> </ul>
Russia	<p>Paperless transactions:</p>

<sup>236</sup> Stats NZ Tatauranga Aotearoa, Electronic-card-transactions, <https://www.stats.govt.nz/assets/Uploads/Electronic-card-transactions/Electronic-card-transactions-January-2022/Download-data/electronic-card-transactions-january-2022.xlsx>

<sup>237</sup> Bank of Papua New Guinea, Retail Electronic Payments System (REPS) Monthly Statistics Updates, [https://www.bankpng.gov.pg/payment-system/national-switch-statistics/#\\_ftn1](https://www.bankpng.gov.pg/payment-system/national-switch-statistics/#_ftn1)

<sup>238</sup> Better Than Cash Alliance (2019) State of digital payments in the Philippines 2019, [https://btca-production-site.s3.amazonaws.com/documents/435/english\\_attachments/The\\_State\\_of\\_Digital\\_Payments\\_in\\_the\\_Philippines\\_ExecSummary.pdf?1577119411](https://btca-production-site.s3.amazonaws.com/documents/435/english_attachments/The_State_of_Digital_Payments_in_the_Philippines_ExecSummary.pdf?1577119411)

<sup>239</sup> The Bangko Sentral ng Pilipinas (2021) Forging Pathways to a Cash-Lite Society: Status of digital payments in the Philippines 2021, [https://www.bsp.gov.ph/PaymentAndSettlement/BSP-Forging\\_pathways\\_to\\_a\\_cash-lite\\_society-Status\\_of\\_Digital\\_Payments\\_in\\_the\\_Philippines\\_\(2021\\_edition\).pdf](https://www.bsp.gov.ph/PaymentAndSettlement/BSP-Forging_pathways_to_a_cash-lite_society-Status_of_Digital_Payments_in_the_Philippines_(2021_edition).pdf)

Economy	Source
	<ul style="list-style-type: none"> <li>Bank for International Settlements (2016 – 2019)</li> </ul> Card-based transactions: <ul style="list-style-type: none"> <li>Bank of Russia<sup>240</sup></li> </ul>
Singapore	Total number of transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> <li>Cash Essentials (2019)<sup>241</sup></li> </ul> Paperless transactions: <ul style="list-style-type: none"> <li>Bank for International Settlements (2016 – 2019)</li> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Card-based transactions: <ul style="list-style-type: none"> <li>Monetary Authority of Singapore<sup>242</sup></li> </ul>
Chinese Taipei	Total number of transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Paperless transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Card-based transactions: <ul style="list-style-type: none"> <li>Electronic Payments International (2019)<sup>243</sup></li> </ul>
Thailand	Total number of transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Paperless transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Card-based transactions: <ul style="list-style-type: none"> <li>Bank of Thailand<sup>244</sup></li> </ul>
USA	Total number of transactions: <ul style="list-style-type: none"> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul>

<sup>240</sup> Bank of Russia, National Payment System Statistics, <https://www.cbr.ru/eng/Psystem/statistics/>

<sup>241</sup> Cash Essentials (2019) Cash is King in Singapore, <https://cashesentials.org/cash-is-king-in-singapore/>

<sup>242</sup> Monetary Authority of Singapore, "Semi-Annual Retail Payment Statistics". Available at: <https://www.mas.gov.sg/statistics/payment-statistics/semi-annual-retail-payment-statistics>

<sup>243</sup> Electronic Payments International (2019) Chinese Taipei POS penetration is poor despite a dense urban environment [Electronic Payments International](#)

<sup>244</sup> Bank of Thailand, Volume of Usage of Plastic Cards for Payment, [https://www.bot.or.th/App/BTWS\\_STAT/statistics/ReportPage.aspx?reportID=683&language=eng](https://www.bot.or.th/App/BTWS_STAT/statistics/ReportPage.aspx?reportID=683&language=eng)

Economy	Source
	<ul style="list-style-type: none"> <li>Statista (2022)<sup>245</sup></li> </ul> Paperless transactions: <ul style="list-style-type: none"> <li>Bank for International Settlements (2016 – 2019)</li> <li>ACI Worldwide (2021)</li> <li>ACI Worldwide (2022)</li> </ul> Card-based transactions: <ul style="list-style-type: none"> <li>The Federal Reserve (2021)<sup>246</sup></li> </ul>
Viet Nam	Card-based transactions: <ul style="list-style-type: none"> <li>The State Bank of Viet Nam<sup>247</sup></li> </ul> Electronic Transactions: <ul style="list-style-type: none"> <li>JP Morgan E-Commerce Payments Trends Report<sup>248</sup></li> </ul>

As the total number of digital transactions in all APEC economies include domestic as well as cross-border transactions, it was important to avoid double-counting of cross-border transactions, once from the originator economy, and once from the receiving economy.

The following formula was used to estimate cross-border transactions:

- Cross border digital transactions in each economy = average number of cross border transactions per capita \* population \* total digital transaction/all transactions for that economy*

Table 5 contains the sources that were used to calculate the value of cross-border transactions within APEC.

**Table 5: Inputs for Calculating Cross-border Transactions within APEC**

Metric	Source
Product trade within APEC	Trade Map (2017-2021) <sup>249</sup>
Cross-border transactions	McKinsey (2018) <sup>250</sup>
Total Imports and Exports	IMF (2021) <sup>251</sup>

<sup>245</sup> Statista (2022), Proportion of cash payment transactions in selected economies worldwide in 2017, <https://www.statista.com/statistics/1055618/cash-payment-transactions-by-country/>

<sup>246</sup> The Federal Reserve (2021) Developments in Noncash Payments for 2019 and 2020: Findings from the Federal Reserve Payments Study, <https://www.federalreserve.gov/publications/files/developments-in-noncash-payments-for-2019-and-2020-20211222.pdf>

<sup>247</sup> The State Bank of Viet Nam Statistics, Domestic Payment Transactions by Non-cash Payment Instruments, [https://www.sbv.gov.vn/webcenter/portal/en/home/sbv/statistic/settleactiv/dtbmol?centerWidth=80%25&leftWidth=20%25&rightWidth=0%25&showFooter=false&showHeader=false&\\_adf.ctrl-state=00hvufxz2\\_414&\\_afLoop=56779236504651224#%40%3F\\_afLoop%3D56779236504651224%26centerWidth%3D80%2525%26leftWidth%3D20%2525%26rightWidth%3D0%2525%26showFooter%3Dfalse%26showHeader%3Dfalse%26\\_adf.ctrl-state%3D16b48uwus4\\_4](https://www.sbv.gov.vn/webcenter/portal/en/home/sbv/statistic/settleactiv/dtbmol?centerWidth=80%25&leftWidth=20%25&rightWidth=0%25&showFooter=false&showHeader=false&_adf.ctrl-state=00hvufxz2_414&_afLoop=56779236504651224#%40%3F_afLoop%3D56779236504651224%26centerWidth%3D80%2525%26leftWidth%3D20%2525%26rightWidth%3D0%2525%26showFooter%3Dfalse%26showHeader%3Dfalse%26_adf.ctrl-state%3D16b48uwus4_4)

<sup>248</sup> <https://www.jpmorgan.com/merchant-services/insights/reports/Viet-Nam-2020>

<sup>249</sup> International Trade Centre, Trade Map: Trade statistics for international business development, <https://www.trademap.org/Index.aspx>

<sup>250</sup> McKinsey & Company (2018), A vision for the future of cross-border payments, <https://www.mckinsey.com/~media/McKinsey/Industries/Financial%20Services/Our%20Insights/A%20vision%20for%20the%20future%20of%20cross%20border%20payments%20final/A-vision-for-the-future-of-cross-border-payments-web-final.ashx>

<sup>251</sup> IMF (2021), Exports and Imports by Areas, <https://data.imf.org/?sk=9D6028D4-F14A-464C-A2F2-59B2CD424B85&sid=1409151240976>

Total population	World Bank (2020) <sup>252</sup>
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<sup>252</sup> World Bank (2020) Population, Total, <https://data.worldbank.org/indicator/SP.POP.TOTL>

Table 6 records the number and proportion of digital transactions, the average number of transactions per adult population, the value of digital transactions as a percentage of household consumption and the average value of each digital transaction across APEC economies.

**Table 6: Summary of Data Related to Digital Transactions Volume and Value**

Economy	Number of digital transactions (millions)	Volume of digital transactions as a percentage of all transactions	Number of transactions per adult population	Value of digital transactions as a percentage of household consumption	Average value of digital transaction (USD)
Australia	3518	19%	212	7%	15.0
Canada	8237	43%	327	8%	9.6
Chile	2930	43%	223	6%	3.5
China	174081	33%	175	32%	9.4
Indonesia	13956	4%	75	10%	4.3
Japan	10085	26%	136	9%	25.1
Korea, Rep.	18639	46%	497	20%	8.5
Malaysia	1862	8%	83	6%	7.0
Mexico	1955	4%	23	6%	26.2
New Zealand	1116	22%	344	7%	7.2
Peru	1161	4%	53	6%	7.4
Philippines	52282	54%	738	8%	0.4
Russian Federation	17637	18%	184	4%	1.9
Singapore	2298	42%	531	7%	4.2
Chinese Taipei	1965	29%	119	44%	18.6
Thailand	15716	40%	318	10%	1.7
United States	85704	35%	399	8%	12.3
Viet Nam	720	43%	11	10%	21.9

## Sizing the Volume of Digital Trade in APEC

To understand the relationship between an economy's adoption of FinTech and the extent to which it participates in digital trade, we compared the proportion of digital transactions in each APEC member economy to the proportion of digital exports it recorded in 2021. A sizing exercise was conducted for three components of digital exports: (i) digitally-enabled goods; (ii) digitally-enabled services; and (iii) indirect digital services embedded in other exports.

- **Digitally-enabled goods.** Digitally-enabled goods refer to business-to-consumer retail goods traded via online channels (e-commerce). For each economy, we obtained estimates for overall digitally-enabled goods traded by the economy and applied an export ratio to obtain the value of digitally-enabled goods that are exported for each economy. The export ratio was proxied by taking merchandise exports as a share of GDP for each of the economy.
- **Digitally-enabled services.** Digitally-enabled services refer to services provided through digital technologies such as online consultancy services, as well as e-service exports such as electronic banking. For each economy, we used the Trade in Value Added (TIVA)<sup>253</sup> in gross exports for Telecommunications and IT and other information services from the OECD Database. As the database contains only data up till 2015, we estimated TIVA from 2016 to 2020 by applying the historical TIVA share of gross exports to 2016-2020 export values. We then computed 2021's TIVA from historical CAGRs from 2016 to 2019. (Note: as TIVA and gross exports data for Papua New Guinea (PNG) were not publicly available, we used Indonesia as a proxy to scale PNG's TIVA till 2016, and applied the TIVA share of merchandise exports for PNG to 2017-2020 merchandise exports data to find TIVA for PNG.)
- **Indirect digital services.** Indirect digital services include imports embedded in other exports, which includes imported digital services that get used in the export other products and services, such as the use of email by a firm when exporting overseas. For the telecommunications and IT and other information services industry, the value added to total gross exports by domestic source industry was subtracted from the value added to total gross exports by source industry. This allowed us to obtain the value added to exports from imports.

Table 7 contains the inputs used for calculating total value of digitally-enabled exports in APEC economies.

**Table 7: Inputs for Calculating Total Value of Digitally-enabled Exports in APEC Economies**

Economy	Source
Australia	Value of retail products sold via e-commerce: <ul style="list-style-type: none"> <li>• Australian Bureau of Statistics (2016 – 2020) <sup>254</sup></li> </ul> Export ratio:

<sup>253</sup> OECD (2018), Trade in Value Added, <https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm>

<sup>254</sup> Australian Bureau of Statistics (2020) Total Online Turnover Sales, <https://www.abs.gov.au/statistics/industry/retail-and-wholesale-trade/retail-trade-australia/sep-2021#data-download>

Economy	Source
	<ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Brunei Darussalam	<p>E-commerce sales in Brunei Darussalam:</p> <ul style="list-style-type: none"> <li>Statista (2021)<sup>255</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Canada	<p>Value of retail products sold via e-commerce:</p> <ul style="list-style-type: none"> <li>Statistics Canada (2021)<sup>256</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Chile	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>Statista (2021)<sup>257</sup></li> </ul> <p>Note: As 2021 data was an estimate, we recomputed 2021's value by assuming that B2C e-commerce sales grew at its historical 2016-2020 CAGR.</p> <p>Export ratio:</p> <p>World Development Indicators</p>
China	<p>E-commerce exports in China:</p> <ul style="list-style-type: none"> <li>Forward Economist (2017 - 2020)<sup>258</sup></li> </ul> <p>Note: As data on e-commerce exports was available, that was used directly in the analysis. We estimated 2021's value based on its historical 2016-2020 CAGR, as 2021 value was not available.</p>
Hong Kong, China	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>JP Morgan E-commerce Payments Trends Report<sup>259</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Indonesia	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>B2C e-commerce product categories in ASEAN: Austrade E-commerce in ASEAN<sup>260</sup></li> <li>E-commerce relevant goods exports: Badan Pusat Statistik<sup>261</sup></li> </ul>

<sup>255</sup> Statista (2022) eCommerce – Brunei Darussalam, <https://www.statista.com/outlook/dmo/ecommerce/brunei-darussalam>

<sup>256</sup> Statistics Canada (2021) Retail e-commerce sales, <https://www150.statcan.gc.ca/t1/tb1/en/tv.action?pid=2010007201&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2016&cubeTimeFrame.endMonth=02&cubeTimeFrame.endYear=2022&referencePeriods=20160101%2C20220201>

<sup>257</sup> Statista (2022) B2C e-commerce sales in Chile from 2010 to 2021, <https://www.statista.com/statistics/256610/annual-b2c-e-commerce-sales-in-chile/>

<sup>258</sup> Forward Economist (2020) 2020 China e-commerce market development, <https://www.qianzhan.com/analyst/detail/220/200813-25b7f321.html>

<sup>259</sup> JP Morgan (2020) 2020 E-commerce Payments Trends Report: Hong Kong, <https://www.ipmorgan.com/merchant-services/insights/reports/hong-kong-2020>

<sup>260</sup> Austrade (2019) E-commerce in ASEAN, <https://www.austrade.gov.au/ArticleDocuments/1358/ecommerce-asean-guide.pdf.aspx>

<sup>261</sup> Badan Pusat Statistik (2022) Jenis Kantor Pos, <https://ntt.bps.go.id/subject/2/Komunikasi.html#subjekViewTab5|accordion-daftar-subjek2>

Economy	Source
	<ul style="list-style-type: none"> <li>Value of consumer goods exports: World Integrated Trade Solution<sup>262</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Japan	<p>Value of B2C digitally-enabled products sold:</p> <ul style="list-style-type: none"> <li>Ministry of Economy, Trade and Industry<sup>263</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Republic of Korea	<p>E-commerce exports in Korea:</p> <ul style="list-style-type: none"> <li>Statistics Korea (2017-2019)<sup>264</sup></li> </ul> <p>Note: As data on e-commerce exports was available, that was used directly in the analysis. We estimated 2021's value based on its historical 2016-2019 CAGR, as 2021 value was not available.</p> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Malaysia	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>B2C e-commerce product categories in ASEAN: Austrade E-commerce in ASEAN<sup>265</sup></li> <li>E-commerce relevant goods exports: Department of Statistics Malaysia<sup>266</sup></li> <li>Value of consumer goods exports: World Integrated Trade Solution<sup>267</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Mexico	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>JP Morgan E-commerce Payments Trends Report<sup>268</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
New Zealand	<p>B2C e-commerce sales:</p>

<sup>262</sup> World Integrated Trade Solution (2022) Indonesia Product exports and imports 2019, <https://wits.worldbank.org/CountryProfile/en/Country/IDN/Year/2019/TradeFlow/EXPIMP/Partner/WLD/Product/all-groups>

<sup>263</sup> Ministry of Economy, Trade and Industry (2021) Results of FY2020 E-Commerce Market Survey Compiled, [https://www.meti.go.jp/english/press/2021/0730\\_002.html](https://www.meti.go.jp/english/press/2021/0730_002.html)

<sup>264</sup> Statistics Korea (2019) Online Shopping in December 2019, <https://kostat.go.kr/portal/eng/pressReleases/3/5/index.board>

<sup>265</sup> Austrade (2019) E-commerce in ASEAN, <https://www.austrade.gov.au/ArticleDocuments/1358/ecommerce-asean-guide.pdf.aspx>

<sup>266</sup> Department of Statistics (2022) Merchandise exports, <https://newss.statistics.gov.my/newss-portalx/ep/epLogin.seam>

<sup>267</sup> World Integrated Trade Solution (2022), Singapore Product exports and imports 2018, <https://wits.worldbank.org/CountryProfile/en/Country/SGP/Year/2018/TradeFlow/EXPIMP/Partner/WLD/Product/All-Groups>

<sup>268</sup> JP Morgan (2020), 2020 E-commerce Payments Trends Report: Mexico, <https://www.jpmorgan.com/merchant-services/insights/reports/mexico-2020>

Economy	Source
	<ul style="list-style-type: none"> <li>JP Morgan E-commerce Payments Trends Report<sup>269</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Papua New Guinea	<p>E-commerce sales in Papua New Guinea:</p> <ul style="list-style-type: none"> <li>Statista (2021)<sup>270</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Peru	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>Statista (2021)<sup>271</sup></li> </ul> <p>Note: As 2021 data was an estimate, we recomputed 2021's value by assuming that B2C e-commerce sales grew at its historical 2016-2020 CAGR.</p> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Philippines	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>Wholesale and retail trade: Philippines Statistics Authority<sup>272</sup></li> <li>Share of firms engaged in e-commerce: Philippines Statistics Authority<sup>273</sup></li> </ul> <p>Note: As 2021 data was an estimate, we recomputed 2021's value by assuming that B2C e-commerce sales grew at its historical 2015-2018 CAGR.</p> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Russia	<p>Online retail market:</p> <ul style="list-style-type: none"> <li>Data Insight (2021)<sup>274</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Singapore	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>B2C e-commerce product categories in ASEAN: Austrade E-commerce in ASEAN<sup>275</sup></li> </ul>

<sup>269</sup> JP Morgan (2020), 2020 E-commerce Payments Trends Report: New Zealand, <https://www.jpmorgan.com/merchant-services/insights/reports/newzealand-2020>

<sup>270</sup> Statista (2022) eCommerce – Brunei Darussalam, <https://www.statista.com/outlook/dmo/ecommerce/papua-new-guinea>

<sup>271</sup> Statista (2022) B2C e-commerce sales in Peru from 2010 to 2021, <https://www.statista.com/statistics/256610/annual-b2c-e-commerce-sales-in-peru/>

<sup>272</sup> Philippines Statistics Authority (2021) Wholesale and Retail Trade, [https://openstat.psa.gov.ph/PXWeb/pxweb/en/DB/DB\\_2D\\_2016/0012D4BAAG0.px/?rxid=e7829ba4-66e6-4ddc-abb-90da6525d203](https://openstat.psa.gov.ph/PXWeb/pxweb/en/DB/DB_2D_2016/0012D4BAAG0.px/?rxid=e7829ba4-66e6-4ddc-abb-90da6525d203)

<sup>273</sup> Philippines Statistics Authority (2017) 2017 Survey on Information and Communication Technology, [https://psa.gov.ph/sites/default/files/2017%20SICT%20Publication\\_signed.pdf](https://psa.gov.ph/sites/default/files/2017%20SICT%20Publication_signed.pdf)

<sup>274</sup> Data Insight (2021) Internet trading in Russia 2021, [https://www.datainsight.ru/eCommerce\\_2021](https://www.datainsight.ru/eCommerce_2021)

<sup>275</sup> Austrade (2019) E-commerce in ASEAN, <https://www.austrade.gov.au/ArticleDocuments/1358/ecommerce-asean-guide.pdf.aspx>

Economy	Source
	<ul style="list-style-type: none"> <li>E-commerce relevant goods exports: Statistics Singapore<sup>276</sup></li> <li>Value of consumer goods exports: World Integrated Trade Solution<sup>277</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Chinese Taipei	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>DGBAS Chinese Taipei (2020)<sup>278</sup></li> </ul> <p>Note: As 2021 data was not available, we estimated 2021's value by assuming that B2C e-commerce sales grew at its historical 2016-2020 CAGR.</p> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Thailand	<p>E-commerce value:</p> <ul style="list-style-type: none"> <li>Electronic Transactions Development Agency</li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
USA	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>Statista (2021)<sup>279</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>
Viet Nam	<p>B2C e-commerce sales:</p> <ul style="list-style-type: none"> <li>B2C e-commerce product categories in ASEAN: Austrade E-commerce in ASEAN<sup>280</sup></li> <li>E-commerce relevant goods exports: General Department of Customs Viet Nam<sup>281</sup></li> <li>Value of consumer goods exports: World Integrated Trade Solution<sup>282</sup></li> </ul> <p>Export ratio:</p> <ul style="list-style-type: none"> <li>World Development Indicators</li> </ul>

<sup>276</sup> Statistics Singapore (2022) Merchandise Trade, <https://www.singstat.gov.sg/find-data/search-by-theme/trade-and-investment/merchandise-trade/latest-data>

<sup>277</sup> World Integrated Trade Solution (2022) Singapore Product exports and imports 2018, <https://wits.worldbank.org/CountryProfile/en/Country/SGP/Year/2018/TradeFlow/EXPIMP/Partner/WLD/Product/All-Groups>

<sup>278</sup> DGBAS Chinese Taipei (2021), Year 109 e-commerce survey results, <https://www.dgbas.gov.tw/public/Attachment/112241522288VPBV68D.pdf>

<sup>279</sup> Statista (2022), "B2C e-commerce sales in Peru from 2010 to 2021." Available at: <https://www.statista.com/statistics/272391/us-retail-e-commerce-sales-forecast/>

<sup>280</sup> Austrade (2019), "E-commerce in ASEAN." Available at: <https://www.austrade.gov.au/ArticleDocuments/1358/ecommerce-asean-guide.pdf.aspx>

<sup>281</sup> General Department of Customs Viet Nam (2019), "E-commerce exports." Available at: <https://www.customs.gov.vn/Lists/EnglishStatisticsCalendars/Attachments/1044/2X.pdf>

<sup>282</sup> World Integrated Trade Solution (2022), "Viet Nam Product exports and imports 2017." Available at: <https://wits.worldbank.org/CountryProfile/en/Country/VNM/Year/2017/TradeFlow/EXPIMP/Partner/WLD/Product/all-groups>

## Regression Analysis of Policy Index and Key Economic Indicators

A regression analysis was also conducted in Section 4 to understand the relationship between key economic indicators and policy enablers. Below are the results of the regressions cited in Section 4. For each regression, we provide a table of coefficients and standard errors for all regressors. Economy and year fixed effects are used in each regression. The dependent variable for each regression is listed above the coefficients.

Variables used in the regressions include:

- `gdpcapita` – GDP per capita with purchasing power parity in thousands of international dollars (World Bank)
- `epayments` – electronic payments in millions of payments; defined as all paperless transactions, including with cards (internal calculations)
- `dpayments` – digital payments in millions of payments; defined as paperless transactions less card transactions (internal calculations)
- `laborforce` – number of residents in the economy’s labor force (World Bank)
- `pillar1` – the enabling policy environment pillar of our policy index (internal calculations)
- `pillar2` – the foundational framework pillar of our policy index (internal calculations)
- `internetusage` – percentage of population using the internet (World Bank)
- `stabilityindex` – composite index for an economy’s political stability (World Bank’s World Governance Indicators)<sup>283</sup>
- `_cons` – intercept term

Regression 1 uses digital payments (i.e., paperless payments excluding card payments) to measure FinTech adoption. Regression 3 takes the exact same form as regression 1, but it uses electronic payments (i.e., paperless payments including card payments) to measure FinTech adoption. The coefficients on regressions 3 are similar to those of regression 1. This consistency validates our approach.

### Regression 1

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
<code>gdpcapita</code>	-74.78778	448.6904	-0.17	0.868	-966.0562	816.4807
<code>laborforce</code>	-.0009828	.0007077	-1.39	0.168	-.0023886	.000423
<code>pillar1</code>	540.7496	664.8493	0.81	0.418	-779.8919	1861.391

<sup>283</sup> World Bank (2020) World Governance Indicators, <http://info.worldbank.org/governance/wgi/>

```
pillar2 | 2452.988 985.3647 2.49 0.015 495.6823 4410.294
_cons | 58668.72 59071.95 0.99 0.323 -58670.46 176007.9
```

```
-----+-----
```

$R^2 = 0.7294$

### Regression 2

```
-----+-----
```

```
gdpcapita | Coef. Std. Err. t P>|t| [95% Conf. Interval]
```

```
-----+-----
```

```
pillar1lag | .3713603 .1812931 2.05 0.045 .0085937 .734127
pillar2lag | .5076879 .2850628 1.78 0.080 -.0627215 1.078097
internetusage | -7.185178 6.884996 -1.04 0.301 -20.96202 6.591668
stabilityindex | .8680958 2.005255 0.43 0.667 -3.144409 4.880601
_cons | 26.37135 4.030434 6.54 0.000 18.30647 34.43623
```

```
-----+-----
```

$R^2 = 0.2443$

### Regression 3

```
dpayments | Coef. Std. Err. t P>|t| [95% Conf. Interval]
```

```
-----+-----
```

```
gdpcapita | 85.42293 537.5947 0.16 0.874 -992.8555 1163.701
laborforce | -.0010732 .0009187 -1.17 0.248 -.0029158 .0007694
pillar1lag | 848.5118 743.357 1.14 0.259 -642.4735 2339.497
pillar2lag | 693.5142 1058.468 0.66 0.515 -1429.504 2816.532
_cons | 85525.02 78646.76 1.09 0.282 -72220.41 243270.4
```

```
-----+-----
```

$R^2 = 0.8080$

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