

## KEY POINTS

- Globalisation and digitalisation have transformed the payments landscape with the emergence of new technologies, players, products and services, and business models.
- ASEAN aims for seamless cross-border payments in the region through the harmonisation and modernisation of payments infrastructure, supported by initiatives in related areas such as digital data governance, cybersecurity, online dispute resolution, and consumer protection for e-commerce.
- Understanding of the implications of these changes in the payments landscape on the financial system is key. ASEAN needs to ensure that regulatory frameworks safeguard the interest of service-users while providing an enabling environment for innovation, promote interoperability, continue investing in ICT infrastructure, while ensuring the security and integrity of data systems.

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## Payment Systems in the Digital Age: Case of ASEAN

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Financial services, particularly payments, have been significantly transformed over the years, underpinned by rapid changes in technology. The rise in cross-border capital flows and trade, and changing consumer behavior towards e-commerce and e-payments, have also driven the expansion in the global payments industry. Consumers and businesses want payment services that offer speed, convenience, ubiquity, safety and value for money. The COVID-19 pandemic has further accelerated the adoption of new technologies and digital platforms such as e-commerce and digital payments.

In general, payment systems consist of a set of instruments, procedures, rules, and users<sup>1</sup>, and are traditionally interbank fund transfer systems. Wholesale payments are transactions between financial institutions, usually large value and settled in real-time; while retail payments pertain to transactions among businesses and individuals and are usually high volume.

Digitalisation has revolutionised payments. This is evident in the emergence of new players (e.g. FinTechs), products and services (e.g. e-payments, micro-lending, crowdsourcing), platforms (e.g. mobile applications), business models (e.g. person-to-person, business-to-business), on top of the high-speed processing of transactions. Payment systems are more complicated when direct participants include non-banks such as microfinance institutions, insurance companies, venture capital firms and financial technology firms (FinTech), which are not regulated as strictly as banks. The legal, operational, and governance issues become more challenging, magnified by the massive volume and value of transactions.

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Various market forces affect payment systems. In traditional systems, economies of scale and economies of scope<sup>2</sup>, or the lower costs incurred due to the size and scope of the system, are prime forces due to the prohibitive costs of initial investments for set-up and infrastructure and the low marginal costs of additional user or transaction. Advancements in technology, however, have brought infrastructure costs down and subsequently reduced the importance of economies of scale and scope. In contrast, network effects have become stronger, especially for mobile payment platforms. The ease of access and use, and range of services and products, drives expansion to a wider market. Accessibility also reduces the cost of switching between payment platforms, although product differentiation could to a certain extent offset this advantage.

### The changing payments landscape

Globalisation and technological innovation have been instrumental in the rapid growth in payment systems over the years. Technological innovation with enhanced data capacity and security has enabled more efficient and safer large-value payment systems, while newer technologies have facilitated the development of new products and business models. These changes have also driven the immense growth of the financial sector over the last few decades, along with greater understanding of risks and challenges inherent in the use of payment systems. As a result, central banks in many countries have become more involved in payment systems and have established formal and systematic oversight functions. In fact, in most cases, central banks play a leading role in payment systems modernisation, which has

become a prominent feature in financial sector reform programs in many countries.

With globalisation and the digital revolution, various trends emerged in the payments landscape as discussed below.

*Increase in digital transactions.* Digital and mobile technology have reshaped consumers' spending habits. E-commerce enabled purchases with a single click of a mouse or button and, supported by e-payments including e-wallets (or e-money), brought unrivalled convenience to consumers around the world. Cash, and debit or credit cards are no longer the only payment options. Mobile payments or e-wallets are increasingly more common due to its convenience, particularly in emerging markets with large populations of unbanked persons and low financial access. Brick and mortar banking is winding down and is being replaced by online banking and e-money services (Table 1). In many AMS, there was only a marginal increase in the number of bank branches since 2010, and even declined in some. In comparison, the number of ATMs, accounts including with e-money service providers, and digital payments transactions, mostly increased across the AMS. Mobile wallets reduce financial exclusion in under-served markets, facilitating e-commerce as well as money transfers and bills payments.

Seamless payments transactions among buyers and sellers are perhaps more manifest in emerging markets, including ASEAN, where there is less regulation and which have bigger and younger populations. The e-wallets ecosystem is exploding across the globe driven by the upsurge in the number of providers in Asia Pacific region.

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<sup>1</sup> BIS Quarterly Review (March 2020)

<sup>2</sup> Economies of scale and scope refers to the declining cost of operations as the number of users and range of products increase. This, and network effects, switching costs, and product differentiation, are discussed in detail in

**Table 1. Selected indicators on financial access, by ASEAN Member States (AMS)**

| AMS               | Bank branches, per 100,000 adults |      | ATMs, per 100,000 adults |       | Account holders at a financial institution or e-money service provider, % age 15+ |      | Made or received digital payments in the past year, % age 15+ |      |
|-------------------|-----------------------------------|------|--------------------------|-------|---|------|---|------|
|                   | 2010                              | 2019 | 2010                     | 2019  | 2011  | 2017 | 2014  | 2017 |
| Brunei Darussalam | 23.3                              | 17.6 | 82.0                     | 74.0  | -   | -    | -   | -    |
| Cambodia          | 4.1                               | 8.3  | 5.3                      | 23.3  | 3.7   | 21.7 | 17.6  | 15.6 |
| Indonesia         | 8.1                               | 15.6 | 13.0                     | 53.4  | 19.6  | 48.9 | 22.4  | 34.6 |
| Lao PDR           | 2.5                               | 3.2* | 8.7                      | 25.7* | 26.8  | 29.1 | -   | 13.3 |
| Malaysia          | 10.9                              | 10.1 | 53.5                     | 44.7  | 66.2  | 85.3 | 57.8  | 70.4 |
| Myanmar           | 1.5                               | 5.6  | 0.1**                    | 6.9   | 22.8***   | 26.0 | 3.9   | 7.7  |
| Philippines       | 7.5                               | 9.2  | 15.1                     | 29.0  | 26.6  | 34.5 | 19.5  | 25.1 |
| Singapore         | 9.8                               | 7.8  | 59.1                     | 58.8  | 98.2  | 97.9 | 33.2  | 62.3 |
| Thailand          | 11.0                              | 11.2 | 81.9                     | 115.1 | 72.7  | 81.6 | 18.1  | 22.7 |
| Viet Nam          | 3.2                               | 4.0  | 17.0                     | 25.9  | 21.4  | 30.8 | 17.6  | 15.6 |
| World             | 11.0                              | 13.6 | 29.8                     | 49.6  | 50.6  | 68.5 | 22.4  | 34.6 |

Source: World Bank World Development Indicators and Global Index Database (last accessed February 2021);

Note: \* 2018 data; \*\* 2012 data; \*\*\*2014 data.

Globally, an estimated 2.1 billion consumers have a mobile wallet in 2019.<sup>3</sup> Majority of e-wallet users come from developing countries, particularly China and India. Within ASEAN, there are at least 150 e-wallet license holders<sup>4</sup>, the more prominent ones being Grab for GrabPay, Gojek for GoPay. In Indonesia alone, 48 e-money licenses have been issued as of April 2020.<sup>5</sup>

As frictionless payments expand, customers also begin to seek convenience, affordability, and efficiency in transactions, driving the momentum for innovation in the payments space. Businesses increasingly face the choice of either adapting to the changing times or risk losing customer loyalty, and are gradually introducing new payment modes. Nonetheless, the growth of e-payments and e-commerce also depend on other factors, including consumers' digital literacy, propensity to adopt new technologies, and to spend; market size which depends on population, demographics, and income; availability of quality information and communications technology (ICT) infrastructure; regulatory landscape; among others.

*Evolving user demand.* At the same time, the accessibility and convenience that e-commerce and e-payments offer are changing household spending patterns. The internet economy has leapt nearly 40% from 2018 to exceed US\$100 billion in gross merchandise value (GMV) in 2019 across the online travel, e-commerce, online media and ride hailing sector and is on track to hit US\$300 billion by 2025.<sup>6</sup> Normally, around half of the budget (50.8%) of low income households in ASEAN go to food, and around a third (31.2%) for middle and high income households.<sup>7</sup> Housing and transport come second and third place, respectively. However, the speed and convenience of making online travel reservations and bookings give the travel sector an edge in e-commerce (Table 2). Likewise, consumer goods covering both consumer electronics and clothing and apparel, which are small and easy to ship (compared to furniture and household goods, for example) and have a range of more affordable options online, also have sizeable shares across the AMS. With the COVID-19 pandemic necessitating rapid adoption of e-commerce, home deliveries, and digital and contactless payments, projections may even be reached earlier than expected.

<sup>3</sup> <https://www.reuters.com/article/sponsored/next-decade-digital-payments>

<sup>4</sup> <https://www.reuters.com/article/us-southeastasia-payments-analysis-idUSKBN1WV2V7>

<sup>5</sup> <https://m2insights.com/the-2020-indonesian-ewallet-race/>

<sup>6</sup> e-Economy SEA 2019, [https://www.blog.google/documents/47/SEA\\_Internet\\_Economy\\_Report\\_2019.pdf](https://www.blog.google/documents/47/SEA_Internet_Economy_Report_2019.pdf)

<sup>7</sup> World Bank Global Consumption Database

**Table 2. Shares of e-commerce market segments to total for selected AMS (in %)**

| Market segments               | ID   | MY   | SG    | TH   | VN   |
|-------------------------------|------|------|-------|------|------|
| Clothes and apparel           | 14.6 | 12.3 | 15.5  | 6.5  | 14.3 |
| Consumer electronics          | 8.1  | 17.3 | 17.9  | 15.3 | 33.6 |
| Food, health and beauty       | 6.8  | 8.3  | 15.5* | 2.3  | 15.7 |
| Furniture and household goods | 8.7  | 13.0 | 8.6   | 5.8  | 14.7 |
| Travel                        | 58.9 | 39.0 | 31.0  | 56.9 | 21.6 |
| Others                        | 2.9  | 10.0 | 11.5  | 13.1 | 0.1  |

Source: JP Morgan E-commerce Payments Trends – Country Insights (2019).

Note: \* includes groceries.

**Rise of digital currencies.** Emerging technologies and innovation, such as blockchain, gave rise to digital money (e.g. cryptocurrencies such as Bitcoin, and central bank digital currency or CBDC). Facilitated by changing consumer demands and the strong private sector role in digital payment solutions, the use of digital money is gaining traction, with some big technology firms proposing the use of cryptocurrencies for transactions currently processed by retail or wholesale payments systems.

Central banks primarily see digital money as a means to improve financial inclusion, but at the same time are compelled to adapt to the advancements in the financial and monetary landscape brought about by technology. Central bank money or CBDC, which is a digital representation of a country's currency, has potential implications on payment systems, monetary policy transmission, as well as financial stability. CBDCs might compete with bank deposits in case customers choose to hold CBDCs instead of deposits, weakening the banks' role in facilitating the flow of funds between savers and borrowers. ASEAN central banks are generally open to new technologies and have been studying the use of blockchain and the development of CBDCs. Cambodia is the first to roll out a CBDC, launching e-money 'Bakong' in 2020. 'Bakong' is targeted for mobile internet users in Cambodia and supports transactions in Cambodian riel and US dollars.

**Advancements in payments technology and infrastructure.** High-speed computing and information processing allow for much faster payments transactions than before. Fast payments will continue to grow rapidly globally and compel incumbent banks, card networks, and payment service providers to upgrade current infrastructure or build new systems to enable faster payments. As they do so, this opens up opportunities for improving other aspects of the payment process, such as security and safety, data capabilities, and standardisation across payment solutions. Hence, the rapid adoption of fast payment systems must be balanced with appropriate safeguards and risk management frameworks.

Speed is particularly crucial to cross-border payments<sup>8</sup>, which normally take longer to process than domestic payments. Interoperability is the biggest hurdle because of the disparate elements, e.g. territories, intermediaries, users, as well as rules, involved in a single cross-border transaction. Addressing interoperability challenges in particular make cross-border payments more efficient and less expensive, and in fact, the big players in the payments industry and FinTechs invest heavily towards cross-border interoperability. Crucial to this is the standardisation of payments format. Gradually, the payments industry is adopting a standardised payment message format (ISO 20022) that provides common definitions and roles for financial messaging, to reduce ambiguity.

<sup>8</sup> Cross-border payments are transactions which contain transfers across separate territories that may have different regulations, structures, and currencies. Hence, cross-border payments are generally more complex than domestic payments, cost more, and often involve foreign exchange and liquidity risks.

The standardised format improves efficiency and reduces cost. Among the AMS, eight have already adopted ISO20022 in their retail payment systems, and Brunei Darussalam for large value payment systems (Table 3). The rest are planning or are in the process of adopting it. ASEAN also developed digital frameworks on cross-border data flows (discussed further in Section 3), which is expected

to improve coherence of policies and regulations across the region, thereby also improving cross-border interoperability. Given the region’s sustained economic expansion and integration, there is plenty of room for growth and improvement in the payments sector. To this end, ASEAN has included enhancing cross-border payments as one of the finance sector’s priority agenda.

**Table 3. Adoption of ISO20022 in AMS**

| AMS         | BN   | KH   | ID                | LA   | MY          | MM   | PH   | SG          | TH   | VN        |
|-------------|------|------|-------------------|------|-------------|------|------|-------------|------|-----------|
| <b>RPS</b>  | Done | Done | 2021-2023         | 2020 | Done        | Done | Done | Done        | Done | Done      |
| <b>LVPS</b> | Done | 2020 | Under development | 2020 | Under study | 2020 | 2021 | Under study | 2022 | 2021-2022 |

Source: ASEAN Secretariat.

Note: RPS – Retail Payment Systems; LVPS – Large Value Payment Systems.

*Amendments in regulations to facilitate innovation.*

Innovative payment products and service schemes, new types of payment service providers, and cross-border integration in payment and settlement systems, are presenting a host of new challenges to the current legal, regulatory, and oversight frameworks. Existing frameworks, which have been developed for the traditional financial products and structures, are not well-suited to the changing financial landscape and can also conflict with policy objectives that support innovation. Globally, regulators seek to collaborate towards promoting greater harmonisation of legal, technical and operational arrangements for payments.

Significant regulatory changes provided the impetus for the explosion of innovation in the finance industry, including payments. One of the more successful policy responses has been the “regulatory sandbox”, an isolated space which mimics real-life environment, provided for innovators to develop and experiment with innovative products and prototypes. In the region, most AMS have adopted regulatory sandboxes. For example, Bank Negara Malaysia launched the FinTech Regulatory Sandbox in 2016. In Thailand, separate regulatory sandboxes were established by Bank of Thailand for products relating to banking such as loans, payments, transfers;

Securities and Exchange Commission for securities and derivative instruments including equity crowdfunding; and the Office of the Insurance Committee for innovative insurance business models and products. The use of innovative solutions such as regulatory sandboxes also provides space for policymakers to carefully study the implications of the digital revolution on financial systems and the broader economy, as the AMS continue to adapt to the rapid changes in the digital era.

**Key ASEAN initiatives related to payments**

Payment and settlement systems is one of the cross-cutting areas for financial integration under the ASEAN Economic Community (AEC) Blueprint 2025. ASEAN is focusing on the standardisation and modernisation of payments infrastructure in the region, which is essential to support interconnectedness in trade, investments, and people mobility. Across the region, payment systems infrastructure and potential for growth are diverse. The AMS are at various stages of reviewing and implementing modernisation plans for payment and settlement systems. Some areas of concern are promoting standardisation,

developing settlement infrastructure for cross-border trade, remittances, retail payment systems, and capital markets. At the regional level, ASEAN adopted the ASEAN Payments Policy Framework (APPF) in 2019 and the Implementing Policy Guidelines (IPG) in 2020, to serve as guide for the establishment of cross-border real-time retail payments in ASEAN.

ASEAN also continues to work on the harmonisation of payments infrastructure across the region, in particular the adoption of ISO20022, to facilitate seamless payments across borders (see Section 2 on the status of ISO20022 in the AMS). The development of an ASEAN Interoperable Quick Response (QR) Code Framework is also ongoing. Once implemented, interoperable QR codes will simplify retail payments across the region. Recently, three real-time real payment system (RT-RPS) cross-border linkages have been established. One is between Thailand's PromptPay and Singapore's PayNow, expected to go into live operation in 2021. The other two are between Thailand and Cambodia, and Thailand and Lao PDR, which commenced in 2020 but on a limited scope and use bank networks.

In addition to the payments framework, the AMS at national levels, are developing and implementing digital roadmaps to guide the modernisation of the finance sectors, and cover diverse areas of the finance sector such as data infrastructure, regulation, banking, government services, among others. For example, Brunei Darussalam has the Digital Payment Roadmap 2019-2025 (DPR), which sets out key strategies towards the digital transformation in payments, and identifies initiatives for implementation. Digital financial innovations in Brunei Darussalam are mainly led by banks, although recent years have seen independent startups providing digital payments and remittance services. Another example is the Indonesia Payment System Blueprint 2025 (IPSB) which aims to build a healthy ecosystem for the development of digital economy and finance in

Indonesia. It involves deep structural transformation towards an integrated and inclusive digital ecosystem, across all economic agents (large and small scale), and the center and local regions. At the core will be the use of digital data for the common good.

To support digitalisation, efforts are underway to harmonise the diverse policies and frameworks of the AMS towards data security and standards. The ASEAN Framework on Digital Data Governance<sup>9</sup> (ASEAN DDG) has been developed to guide cross-border data flow (CBDF) mechanism for ASEAN. It provides businesses in ASEAN, on a voluntary basis, with means to ensure that data is equally protected, technically and legally, when transferred to another party across the border. Moreover, the digital sector has various initiatives on strengthening national coordination in responding to cybersecurity threats and incidents. Cybersecurity capacity building programmes have been conducted for ASEAN government officials and public infrastructure operators, such as those provided by the ASEAN-Japan Cybersecurity Capacity Building Centre in Bangkok, multidisciplinary cybersecurity training courses at the ASEAN Singapore Cybersecurity Centre of Excellence, as well as cooperation on the development of awareness-raising and educational materials among ASEAN's national Computer/Cybersecurity Emergency Response Teams (CERTs).

In other sectors, the Feasibility Study of the Online Dispute Resolution (ODR) was conducted to better understand the benefits and challenges of setting-up an ODR system, and to facilitate the resolution of claims over e-Commerce transactions, with special attention to low value or cross-border transactions. The ASEAN ODR Guidelines are being developed to guide the AMS in setting up and operationalising national ODR systems (which later can be interlinked), as well as the ASEAN Guidelines on Consumer Protection in e-Commerce to guide AMS in completing or modernising their legal framework on consumer

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<sup>9</sup> The ASEAN DDG builds on the ASEAN Framework on Personal Data Protection adopted in 2016. Under the ASEAN DDG, the ASEAN Model Contractual Clauses for CBDF (adopted in January 2021) and the ASEAN Certification (due 2021), could be adopted by digital financial service providers to ensure their customers' data is protected when transferred/shared to/with other entities across borders.

protection. Already, a total of nine consumer protection initiatives have been integrated into the ASEAN Work Programme on e-Commerce.<sup>10</sup> A series of regional information campaigns was also launched to enhance consumer knowledge of key issues such as online shopping, and for businesses to ensure price transparency, establish secure payment channels, and provide customer care online. Meanwhile, the Handbook on e-Commerce and Competition in ASEAN was developed to assess how e-Commerce impacts traditional competition dynamics and outlines policy considerations and advocacy strategies to address the challenges of enforcing competition law with the rise of e-Commerce activities. An ASEAN Investigation Manual on Competition Policy and Law (CPL) for the Digital Economy by 2025 is also being developed.

## Recommendations

Payment systems in ASEAN have seen rapid changes in recent years with people increasingly using card, mobile, and electronic wallets. Clearly, there is a shift from cash to electronic payments although becoming a cashless society is still a long-way to go. Increased connectivity and changing consumer expectations have pushed the AMS to modernise their payment systems infrastructures. Modern payment and settlement systems and well-designed infrastructures, particularly at the regional level, have the potential to significantly reduce costs and speed-up payments, as well as integrate the unbanked segments of society.

Nonetheless, advancements in financial innovation including payment systems bring risks to financial stability. While these new technologies and solutions have brought about rapid transformation in the finance sector, e.g. new products, users, players, as well as infrastructures, understanding of their implications on the financial system, including monetary policy, remains limited.

Consequently, existing supervision and regulatory frameworks may not be able to adequately monitor the changing financial landscape and address the corresponding risks. Recognising these issues, a number of policy recommendations are proposed.

- ◆ *First*, the regulatory environment has become a key area of consideration in the move towards innovation in payments and the adoption of new technologies. As such, **a thorough review of established processes and systems across areas, including monetary policy and regulatory surveillance, is needed.** The AMS also need to intensify efforts to ensure that regulatory mechanisms are adequate to manage possible risks arising from the fast-changing financial systems, and maintain financial stability. For example, payment systems should remain safe and efficient, and the interest and welfare of consumers should take precedence. Thus, the **AMS should ensure that regulatory frameworks safeguard the interest of service-users while providing an enabling environment for innovation.**
- ◆ *Second*, investment in critical digital infrastructure matters. Access to financial services, including digital payments, vary among the AMS, largely due to underdeveloped financial ICT infrastructure in some AMS. As a result, adoption rates for e-payments and the development of e-commerce platforms also vary among the AMS. **Investing in ICT infrastructure would support the development of payment systems in the region.**
- ◆ *Third*, along with the transformation in the payments landscape, there is a huge potential for the use of big data and analytics. While technology firms and FinTechs have capitalised on big data, governments, including central banks and finance agencies,

<sup>10</sup> Among these are the incorporation of a principle to protect consumers in e-Commerce transactions under the ASEAN High-Level Principles on Consumer Protection (AHLPP), the development of the ASEAN Online Business Code of Conduct, and the ASEAN Guidelines on Cross-Border Business to Consumer (B2C) Dispute Resolution.

are just starting to explore the characteristics of big data and its implications on regulation and policymaking. Thus, **AMS need to improve its capability in this area, to take advantage of the use of big data for improving governance systems, and to ensure the security and integrity of data and digital systems.** Related to this, **traditional financial service providers and businesses must adapt and innovate to the new financial ecosystem.** The government could provide assistance through capacity-building, financing, or technical support to help these businesses transform and survive.

- ◆ *Finally*, cooperation and collaboration among stakeholders is key in keeping up with the changing payments landscape and in further promoting innovation and digitalisation in payment systems. The AMS **should prioritise the harmonisation of standards to ensure interoperability of systems; promote the adoption of common data frameworks for faster cross-border transactions; and develop regulatory frameworks to smoothen transactions across jurisdictions.** At the same time, safeguards should be in place to minimise disruptions in payment systems across the region in case security issues in one area.

ASEAN is progressing with cross-border interoperability in payments, seeking connectivity among different trade platforms, overhauling its capital market infrastructures, and embracing digitalisation and the Fourth Industrial Revolution. However, the work has just started and there remains plenty of challenges that need to be tackled before a seamless regional payment system in ASEAN is achieved. For now, ASEAN can focus on reviewing relevant domestic regulations and practices, as well as financial systems structures; exploring options for reducing frictions in cross-border payments across the region; and on establishing the essential building blocks for an efficient, competitive and secure cross-border payment system in the region.

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