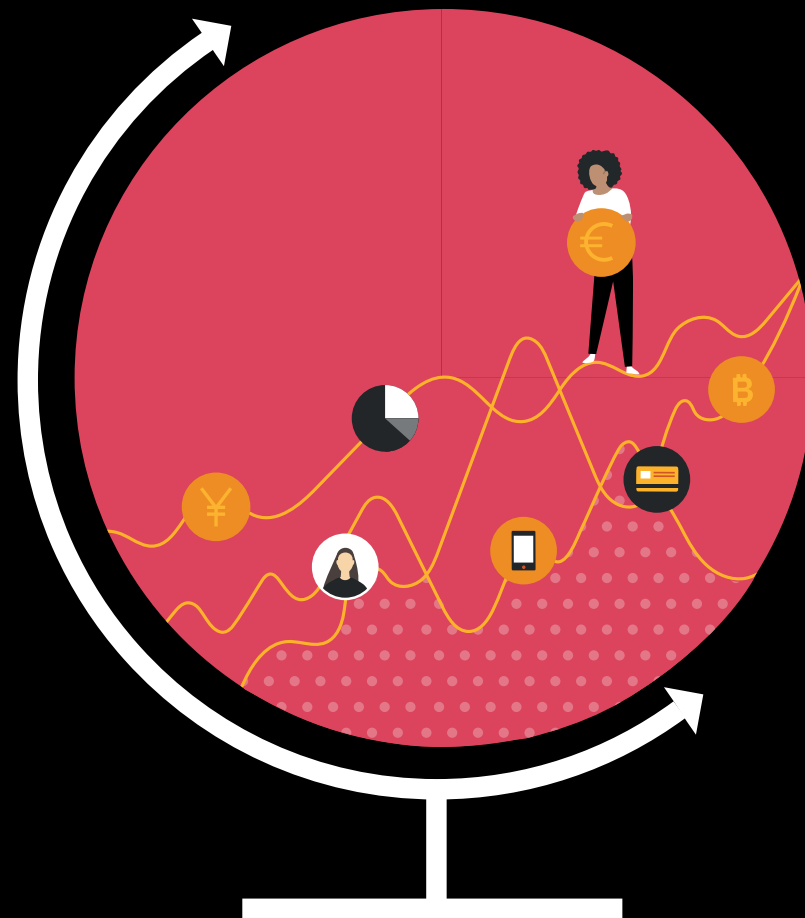




Navigating the payments matrix

Charting a course amid evolution and revolution

PAYMENTS 2025 & BEYOND



Foreword

Dear reader,

The financial-services industry is in the midst of a significant transformation, accelerated by the COVID-19 pandemic. And given the key role digitisation plays in the financial lives of more and more of the world's population, electronic payments are at the epicentre of this transformation.

Payments are increasingly becoming cashless, and the industry's role in fostering inclusion has become a significant priority. Payments also are supporting the development of digital economies and are driving innovation—all while functioning as a stable backbone for our economies.

We are therefore delighted that the first report we are launching in our *2025 & Beyond* series focuses on the payments industry and the key themes that are influencing it. How the industry responds to these trends will define both how successful it is in the coming years and its impact on society overall.

We hope that you find these insights helpful and provocative. Please feel free to reach out to me and my colleagues with your comments and feedback.

Sincerely,

Peter C. Pollini
Principal, PwC US
peter.c.pollini@pwc.com



Where are we now?

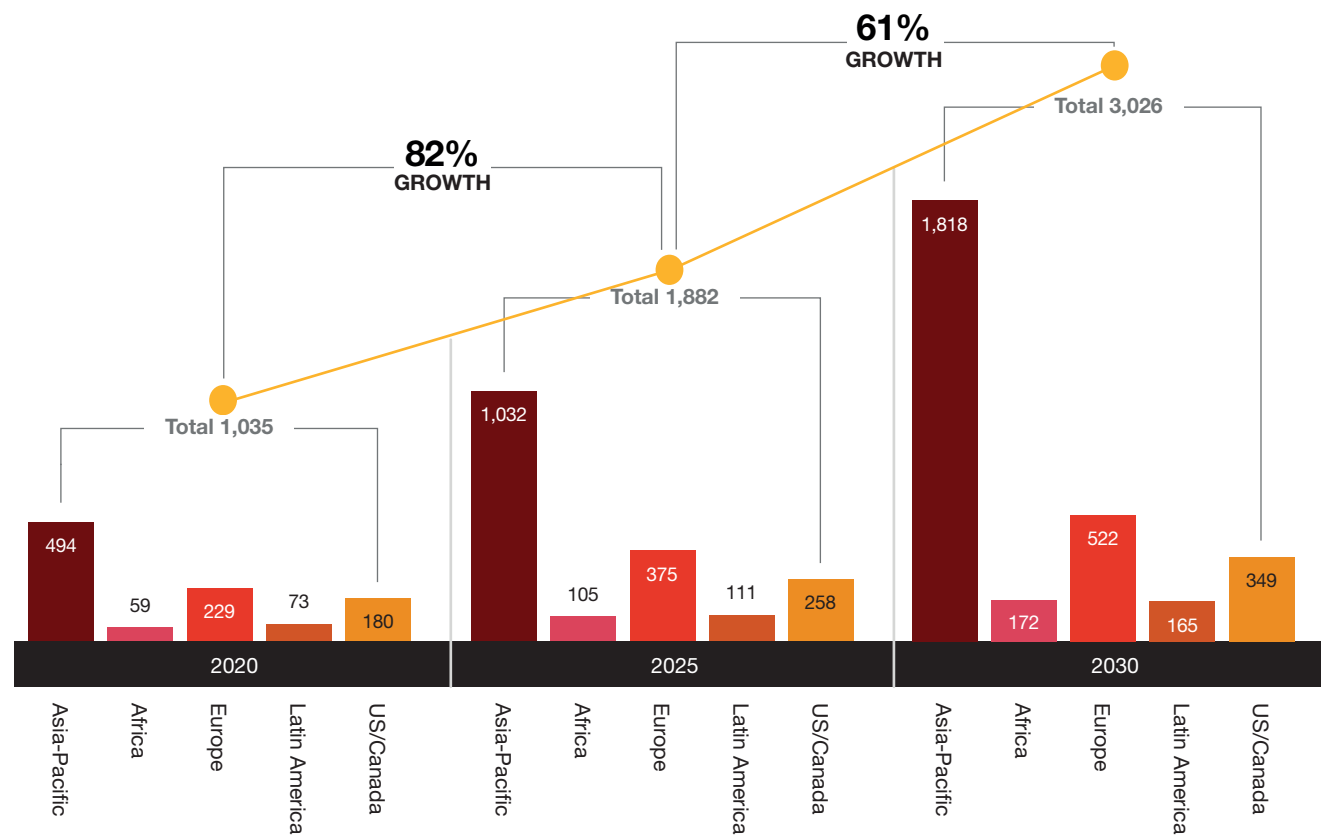
Sending a text to pay for a bus ticket in Turkey, using a QR code to buy groceries in China, or tapping a sales terminal with a mobile phone in the US.

Even before COVID-19, these ways of paying for goods and services were evidence of a steady shift to digital payments—a shift that might ultimately lead to a cashless global society. Global cashless payment volumes are set to increase by more than 80% from 2020 to 2025, from about 1tn transactions to almost 1.9tn, and to almost triple by 2030, according to analysis by PwC and Strategy&, PwC's strategy consulting business.

Asia-Pacific will grow fastest, with cashless transaction volume increasing by 109% from 2020 to 2025 and then by 76% from 2025 to 2030, followed by Africa (78%, 64%) and Europe (64%, 39%). Latin America comes next (52%, 48%), and the US and Canada will have the least rapid growth (43%, 35%) (see Figure 1).

This means that by 2030, the number of cashless transactions per capita will be roughly double to triple the current level, across regions (see Figure 2).

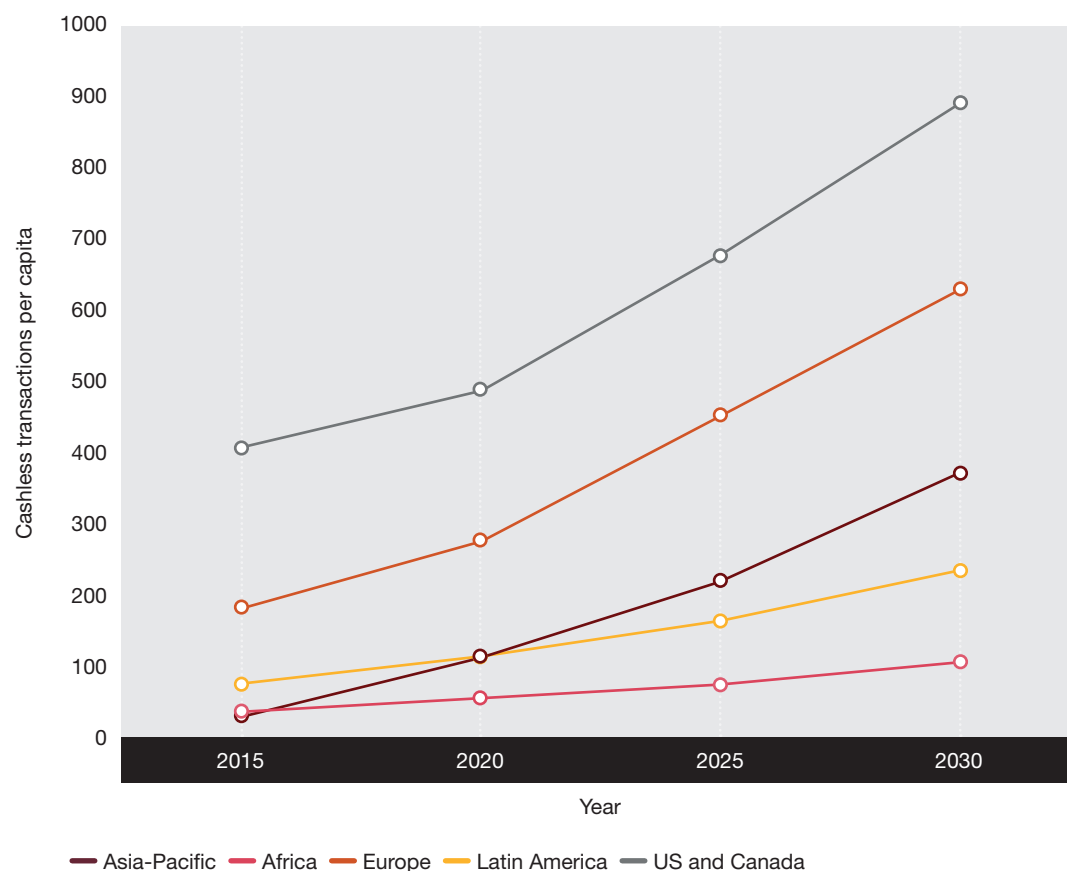
Figure 1: Cashless transaction volume will more than double by 2030
Number of cashless transactions in billions



Note: Cashless transaction totals for 2025 and 2030 are projections.

Source: PwC Strategy& global payments model, 2021

Figure 2: Cashless uptake is projected to rapidly increase through 2030



Note: Transactions for 2025 and 2030 are projections.

Source: PwC Strategy& global payments model, 2021

During COVID-19 lockdowns, many people adopted digital behaviours, accelerating the proliferation of mobile-first digital economies and rendering cash even less relevant to daily life than it already was (although in less developed economies, cash remained essential). In our latest global survey of banking, fintech and payments organisations, 89% of respondents agreed that the shift towards e-commerce would continue to increase, requiring significant investment in online payment solutions. Not only that, but a large majority (97%) agreed that there will be a move towards more real-time payments.

Beneath the shift to cashless lies a larger, more profound change. Not only are traditional ways of paying for goods and services—including the humble paper check and analogue invoices—set for radical transformation, but the entire infrastructure of payments is being reshaped, with new business models emerging.

That reshaping involves two parallel trends: an *evolution* of the front- and back-end parts of the payment system (instant payments; bill payments and request to pay; and plastic cards and digital wallets) and a *revolution* involving huge structural changes to the payment mix and ecosystem (emergence of so-called ‘buy now, pay later’ offerings; cryptocurrencies; and work underway on central bank digital currencies).

Both evolution and revolution are sweeping the globe, but in different ways and at different paces, creating a complex payments matrix. Many organisations are trying to figure out where to play and how to win in that matrix, as evidenced by the intense level of merger and acquisition (M&A) activity since 2017.

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The payments industry advanced in an irreversible quantum leap during COVID-19, which will have massive consequences for years to come.”

Marc-Henri Desportes,
Deputy CEO, Worldline,
a global payments and
transactional services
company

Trends driving M&A activity

- **Processor consolidation.** This has been a US-led trend, dominated by the pursuit of domestic scale, culminating in three landmark, multibillion-dollar deals in 2019: the acquisition by Global Payments of TSYS; Fiserv buying First Data; and FIS acquiring Worldpay.
- **Merchant services.** Another trend is spreading across the US and Europe. Examples include Italian payment processor Nexi in 2020 buying Danish rival Nets to form a pan-European merchant services player and the acquisition of Ingenico by French firm Worldline the same year, following its purchase of Swiss-based SIX Payment Services in 2018.
- **Card networks moving closer to the user.** This trend started with Mastercard acquiring UK's Vocalink in 2016, and then purchasing Nets's account-to-account business in 2020, a year that also saw Visa's attempt to buy Plaid, an open banking aggregator.
- **Global mobile wallets and 'super-apps.'** A nascent theme could become one of the biggest. Alipay has been pursuing a global mobile wallet play with multiple investments in domestic mobile wallets and franchises in Asia. Big Tech firms are also investing in leading payment technologies globally.

Fast-growing Asian markets are driving new business models and innovation. In China, Alipay and WeChat Pay, which are owned, respectively, by e-commerce giants Ant Group and Tencent, have created a new paradigm with 'super-apps' as payments platforms. In our latest global survey of senior financial-services executives, 78% of respondents said Asian institutions will move at a faster pace on globalisation and convergence than the rest of the world up to 2025, and those in Europe and the Americas will struggle to keep up.

Given their rising strategic significance, some governments are developing payments infrastructure as part of industrial policy to control money flows and own digital and data platforms. These changes have resulted in a mushrooming of domestic payment methods on the back of that infrastructure, such as [Troy](#) in Turkey, [Mir](#) in Russia, and Brazil's [Elo](#) and [Pix](#) systems.

The sector has also become increasingly important as a catalyst for reducing transaction costs, fostering growth and supporting the transition towards digitally enabled and inclusive economies. In developing economic regions in Africa, payments are growing faster than the global average and are allowing millions of unbanked people to gain access to goods and services without cash.

The key asset in all of this is data. Payments generate roughly 90% of banks' useful customer data—information about who is buying what, how much and when. This is creating new revenue streams for payments businesses that can monetise that data, yet it also exposes them to risks related to data privacy.

In our survey, data privacy and cybersecurity were, as one category, the top concern (48%) in terms of the impact of regulatory changes over the next five years. This far outstrips second-ranked digital identity and authentication (31%), and is well ahead of cryptocurrencies and central bank digital currencies (CBDCs) (ranked joint fifth at 28%).

Recent developments in how money moves—and even what defines money—are the most profound changes that we'll see in the payments industry for decades to come. How the payments matrix develops will depend on how banks, technology companies, regulators, governments and consumers respond to these changes.

Six macro trends affecting the future of payments

Six macro trends—driven by a combination of consumer preference, technology, regulation and M&A—will determine how the next five years play out (see Figure 3). We believe leadership teams need to understand each of these trends in order to properly plan for their future.

Figure 3: Six payments macro trends

1 Inclusion and trust

- Two-pronged strategies and opportunity will drive consumer and merchant inclusion (especially across Africa, Latin America and Asia).
- Focus on mobile money, wallets, and domestic and QR code solutions will ensure reach and low cost.
- Central banks will maintain their role in ensuring privacy, stability and trust in new providers, payment methods and the financial system.

2 Digital currencies

- Sixty percent of central banks are exploring digital currencies; 14% are conducting pilot tests.
- Decentralised finance and private cryptocurrencies are facing central bank concerns about undermining the conduct of monetary policy.
- Fiat-cryptocurrency conversion and storage are emerging opportunities.

3 Digital wallets

- Use of mobile payments will continue its inexorable rise. (CAGR between 2019 and 2024 is estimated at 23%.)
- QR code, open banking and super-app proliferation will drive digital wallet adoption.
- Convenience will drive users and usage to digital wallets as a first point of contact—and away from traditional card and banking interfaces.
- B2B and digitised supply chains are the next frontiers for wallets.



4 Battle of the rails

- Payment initiation is changing from cards and accounts to digital wallets that are supported by open banking.
- Regulators will force the industry to strengthen domestic infrastructure for payments.
- Consumers in emerging markets are leapfrogging the 'card age' and migrating directly to mobile wallets and account-based payments.
- Both traditional card networks and domestic wallet solutions will be challenged to connect 'open loop' payments with cross-border payments to retain relevance.

5 Cross-border payments

- Instant, low-cost payments are driving the reinvention of cross-border payments.
- Global payments standardisation will enable cross-border connectivity of domestic instant solutions.
- Regional solutions (especially in Asia) and global nonbank solutions based on cryptocurrency and digital wallets will emerge.

6 Financial crime

- As consumers and businesses adopt open banking and instant and alternative payments, organised 'fraud-as-a-service' is growing.
- In our survey, security, compliance and data-privacy risks were the top concerns for banks and fintechs.
- As financial crime becomes more sophisticated, providers will need to protect their full ecosystem.

1

Inclusion

and trust

In 2014, the World Bank set a goal under its Universal Financial Access [programme](#) that by 2020, adults who were not part of the formal financial system would be able to have access to a transaction account to store money and send and receive payments.

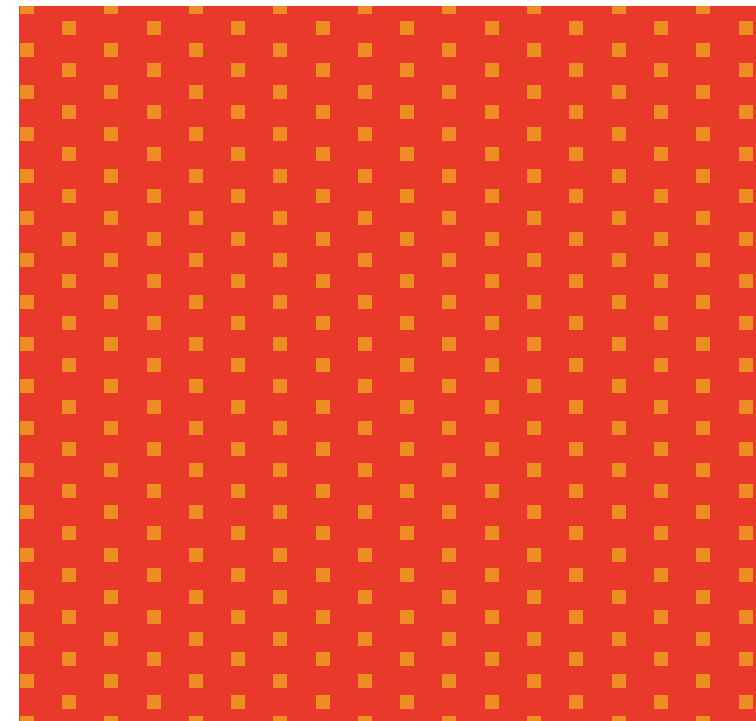
That goal is still some way from being achieved, but the number of initiatives is growing. One example: Thailand's PromptPay, which enables users to make and receive payments using bank accounts or digital wallets linked to their national ID, mobile phone number or email address.

By 2019, [it had attracted 43m subscribers](#), in a country with a population at the time of 69.5m.

In developing countries, financial inclusion will continue to be driven by mobile devices and access to affordable, convenient payment mechanisms. By 2025, [smartphone penetration will likely reach 80% globally](#), largely via uptake in emerging markets such as Indonesia, Pakistan and Mexico. Trust in these systems, particularly as central banks consider the feasibility of CBDCs, puts new emphasis on the role of supervisors to ensure data privacy and traceability for consumers and businesses.

In 2017, only 69% of the global adult population had a bank account or mobile wallet—far from the 2020 objective of full financial inclusion.

Source: The World Bank Group



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The global pandemic has accelerated the use of digital technology, impacting the more vulnerable members of our society. As the payments industry innovates at pace, we must be mindful that everyone needs to be digitally included, not just in the future but also in the here and now.”

Marion King, Director of Payments, NatWest, a UK bank

“

The South African payments industry has an ambitious plan to deliver a platform that enables digital financial inclusion for citizens and recovery for the South African economy. To realise this, we are collaborating with traditional and nontraditional players.”

Jan Pilbauer, CEO, BankservAfrica, Africa's largest automated clearing house

“

Guiding people through the world of digital banking is part of our social responsibility, and we are doing everything we can to deliver significant, satisfying results. Digitisation is a win for everybody, but only if no one is left behind.”

Karel Baert, CEO, Febelfin, the Belgian Financial Sector Federation

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Digital currencies

CBDCs—digital tokens or electronic records that represent the virtual form of a nation’s currency—along with private-sector cryptocurrencies are predicted to have the biggest disruptive impact over the next 20 years (see Figure 4). In our survey, financial-services organisations in Europe, the Middle East and Africa with more than US\$5bn in revenues cited “market uncertainty and potential disruption,” such as the introduction of CBDCs, within their top three concerns.

Prominent private-sector examples such as the Diem, proposed in 2019 by Facebook as a form of cryptocurrency that would be backed by a basket of sovereign currencies, could replace account-based payments with a tokenised system of non-sovereign payment systems.

Scepticism within central banks about the potential of private-sector cryptocurrencies to undermine the conduct of monetary policy may begin to shift, as some players—Mastercard, Visa and BNY Mellon—[have recently said](#) they’re prepared to facilitate use of such digital assets. And a recent [BIS survey](#) suggests that 60% of central banks are considering CBDCs and 14% are actively

conducting pilot tests. Observers believe that China may be the first to launch its digital renminbi—or ‘e-yuan’—at the 2022 Winter Olympics, in what could be seen as a prelude to the decentralisation of finance.

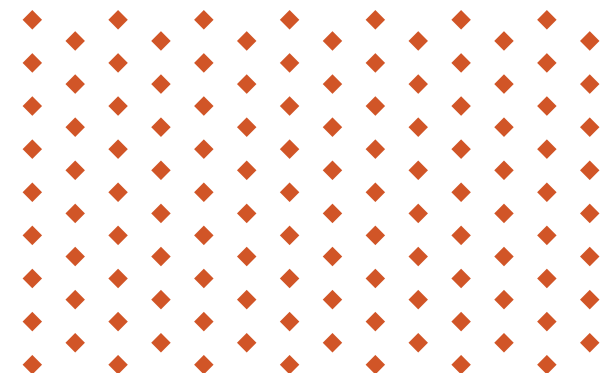
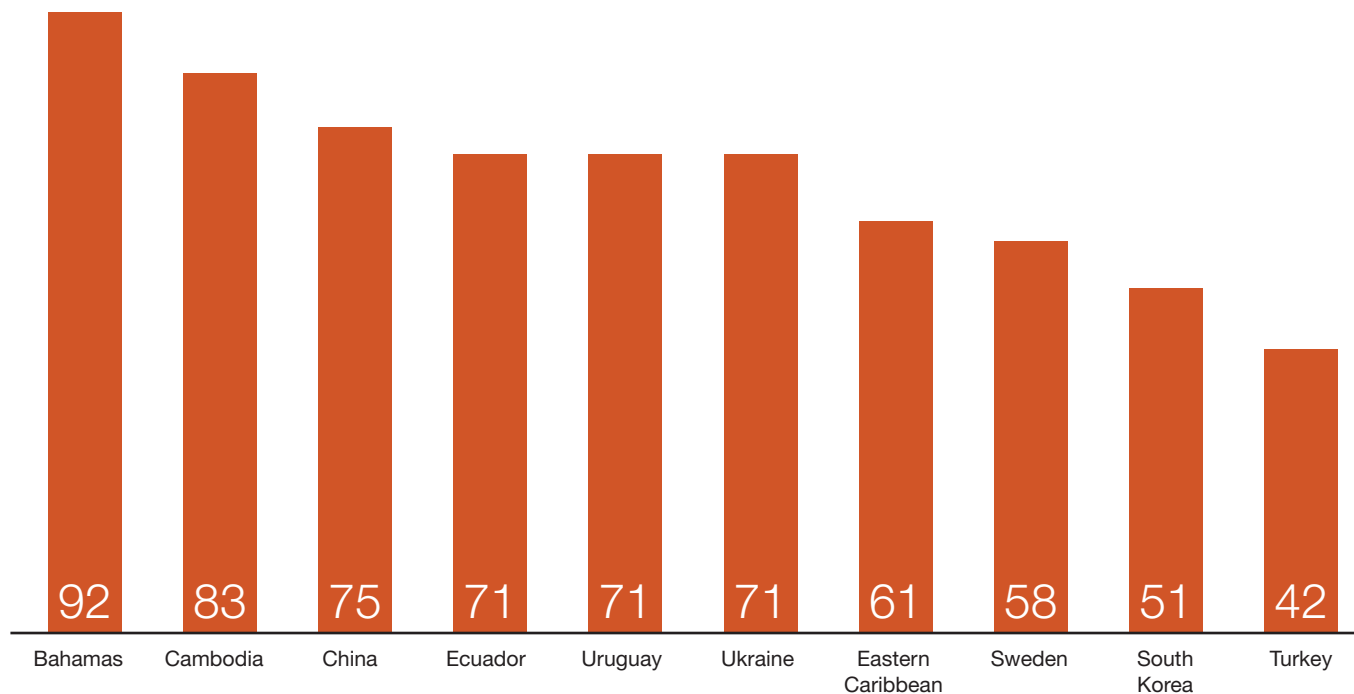


Figure 4: Top ten territories in number of retail CBDC (central bank digital currency) projects



Note: Totals are rebased against an index of 100 and are dependent on the availability of data.

Source: BIS, *Bank of International Settlements working paper No. 880: Rise of the central bank digital currencies: Drivers, approaches and technologies*, Dec 2020 update, and PwC analysis

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Macro forces shaping the digital revolution make for an incredible melting pot for innovation, with central bank money, commercial bank money and private money competing for a share of consumers' wallets.”

Dr Arif Ismail, Divisional Head—Fintech, executive management department, South African Reserve Bank

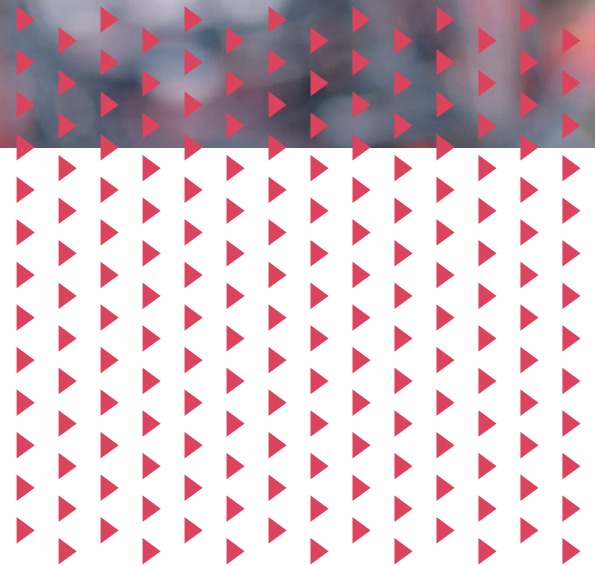
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Digital wallets

Digital wallets allow consumers to load and store payment methods and access funding sources, such as cards or accounts, on their mobile devices. These wallets will be increasingly important as a payment ‘front end,’ as exemplified by Apple Pay and the relaunched Google Pay, and the rise of super-apps WeChat Pay and Alipay in China (see Figure 5).

The use of digital wallet-based transactions grew globally by 7% in 2020, according to a report by FIS, a financial-services technology group, which predicts that digital wallets will account for more than half of all e-commerce payments worldwide by 2024, as consumers shift from card-based to account- and QR code-based transactions.

In response, banks and card companies have been partnering with or investing in digital wallet businesses to create payments platforms with scale, such as Standard Chartered’s venture with [Toss](#), the largest payments company in South Korea, operated by Viva Republica; and Visa’s stake in Interswitch, a Nigeria-based payments business that operates the mobile payments platform Quickteller.



Looking ahead, 86% of our survey respondents agreed or strongly agreed with the prediction that traditional payment providers will collaborate with fintechs and technology providers as a main source of innovation.

Forty-five percent of respondents strongly agreed that there will be increased investment in mobile technology beyond retail payments to support B2B payments and the digitisation of supply chains.

Figure 5: Digital wallets connect the evolving present and the revolutionary future



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Customers are going to continue to embrace the wallets that match their preferences—whether it’s the type of phone they own or how they bank or even their location. Merchants should therefore prepare to offer a suite of wallet offerings based on their customers and their demographics.”

Brian Dammeir, President of North America, Adyen

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Battle of the rails

Behind-the-scenes payment processing—the ‘plumbing’ of payments—is also changing, as payment initiation changes from cards and traditional accounts to digital wallets and as regulators force the industry to strengthen domestic infrastructure for payments (see Figure 6).

“Digitisation of customer journeys will foster a battle of rails between card- and account-based payments. Success will be linked to costs but more importantly to user experience, flexibility and the protection that payment products offer to the customer,” says Pierre-Antoine Vacheron, CEO of Natixis Payments.

As a result, international card networks and card processors, often US-domiciled, are facing pressure on their core business, and have started to reposition themselves to retain relevance. Outsourcing of cloud and platform infrastructure will become increasingly important, too. In our survey, eight out of ten financial-services organisations expected to outsource such infrastructure by 2025.

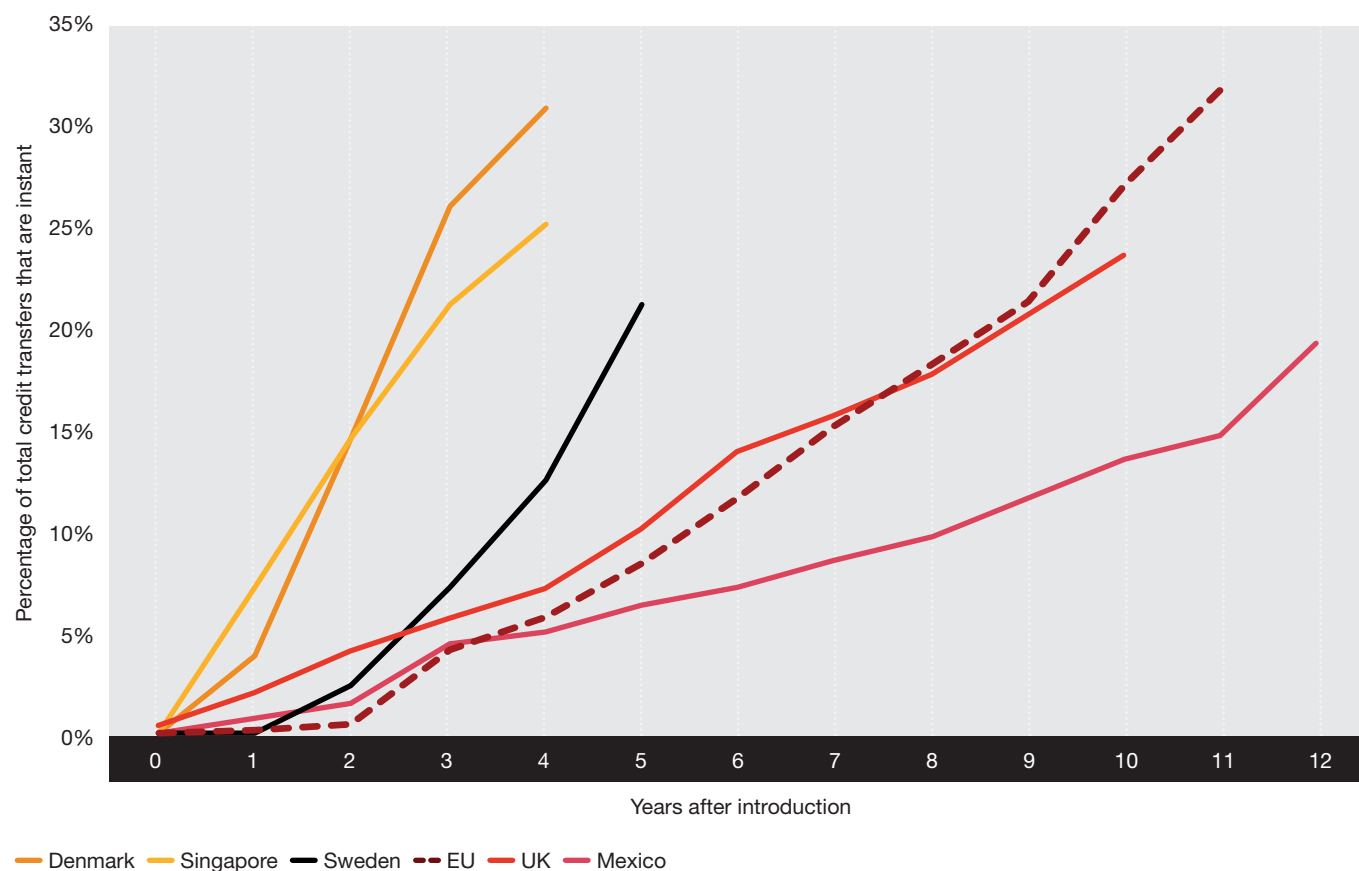
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The increasing availability of real-time payment options will fundamentally reshape payment interactions for both consumers and businesses—from how payments are requested to how they are made, received and verified. Payments will also carry more data, so the future will be about leveraging data and analytics to create smarter customer experiences.”

Byron Vielehr, Chief Digital and Data Officer, Fiserv

Another issue for processors and networks will be ensuring relevance in the merchant services space, where payments are initiated. They can double down on the provision of value-added services and broaden the existing card rails to include a wider range of payee and payer points. Digital wallet providers will look to adopt 'open loop' technologies and seek interoperability in order to benefit from (and not fall behind on) the ongoing globalisation of payment rails.

Figure 6: Instant payments will increase across territories



Source: Hartmann et al., ECB Working papers 2017–19, analysed and adapted by PwC Strategy&

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Cross-border payments

Frustration with the traditional correspondent banking model, considered both cumbersome and costly in a world of instant, low-cost payments, has led to the intensification of non-bank providers. New players and solutions are competing with bank- and card-based solutions at scale, like the P27 initiative in the Nordic region, which integrates 27m people across four countries and currencies in one 'domestic' instant payment system.

In our survey, 42% of respondents said they felt strongly that there would be an acceleration of cross-border, cross-currency instant payments and B2B payments in the next five years. This expectation is reinforced by the adoption of ISO 20022, a globally developed methodology for transmitting data that provides a consistent messaging standard for payments.

A recent pilot by Faster Payments Service, owned and operated by British retail payments authority Pay.UK, saw the fastest payment ever sent from Australia to a UK beneficiary: confirmation of credit and funds were available in just 36 seconds. Singapore and Thailand recently linked their respective national systems PayNow and PromptPay, allowing registered users on either system to instantly send money between the two countries using only a mobile phone number.

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A remarkable leap in blockchain and digital currency growth shows great promise in dealing with inefficiencies that are inherent in cross-border payments processes. Therefore, in coming years, we will see a significant shift in the payments architecture that will connect payments systems across countries. Such interoperable and connected global systems will further drive an inclusive, sustainable and equitable society.”

Sopnendu Mohanty, Chief Fintech Officer, Monetary Authority of Singapore

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Financial

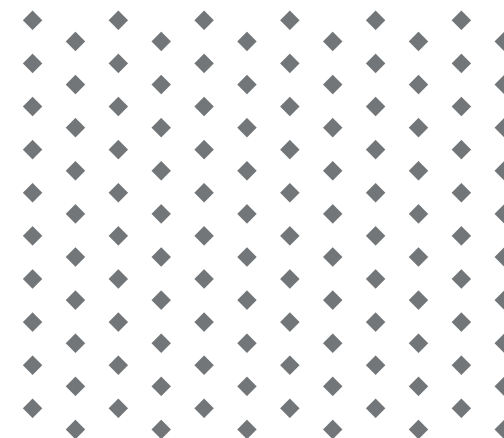
crime

The pandemic's effect in driving increased e-commerce provided an opening for fraudsters. The average value of attempted fraudulent purchases rose by almost 70% in 2020 from the previous year, according to a report by digital fraud prevention company Sift.

Open banking, combined with a set of new players and the shift towards payment initiation and digital wallets, is also opening new doors for all types of financial crime. One example is the increased risk to consumers from authorised push payment (APP) scams across

payment networks, globally. Payment providers that help merchants and their customers move money across borders might also enable sanctions evasion and money laundering.

In our survey, security, compliance, and data-privacy risks and related issues were the top concern for banks, fintechs and asset managers in implementing a fully integrated technology strategy. All this points to the need for, and likelihood of, greater collaboration among banks, payment providers and the public sector in preventing fraud and money laundering, with expected trade-offs between cybersecurity measures and customer convenience, according to a recent Bank for International Settlements report.



Trending solutions

Machine learning-based tools

Analytical services with machine learning and artificial intelligence (AI) capabilities can identify authorised payment fraud. They encompass the speed and processing capabilities that are required to analyse data in real time.

Risk scoring tools

Risk scoring tools use statistical models to identify possibly fraudulent transactions. Risk scoring allocates a probability of fraud using evolving criteria.

Mule account modelling tools

Mule accounts (those set up by a real customer but with fraudulent papers or a fake identity to enable criminal use) can be targeted using modelling tools that find behaviour patterns in anonymous crowdsourced intelligence from millions of daily consumer activities.

Implications for payments players

Understanding these trends is crucial for banks, card companies, fintechs and others that want to map a new path to 2025 and beyond.

Banks need to work with business customers to aid them in integrating payments into their services directly. This will help them deal with a world in which increasingly multifunctional digital wallets and super-apps are proliferating. Bill payments and request-to-pay or instant cross-border offerings could provide opportunities for some larger banks.

Card processors might need to consider moves that position them more effectively for payments initiation, such as partnering with significant digital wallet providers. In this way, they can ensure relevance in the merchant services space, where payments are initiated. Processors also need to bridge the card- and account-based payment worlds and adopt cloud and AI technologies to avoid being overtaken by a new generation of cloud-based solutions.

Payment services providers have to work on ensuring transparent global structures and creating trust and visibility with regard to client acceptance, their ability to bear credit risk, and efficient global supervision structures. They also need to fully master data to win in the race for global scale.

Central banks and supervisors will need to improve their knowledge in order to provide effective supervision of increasingly global players that are not banks (see Figure 7).

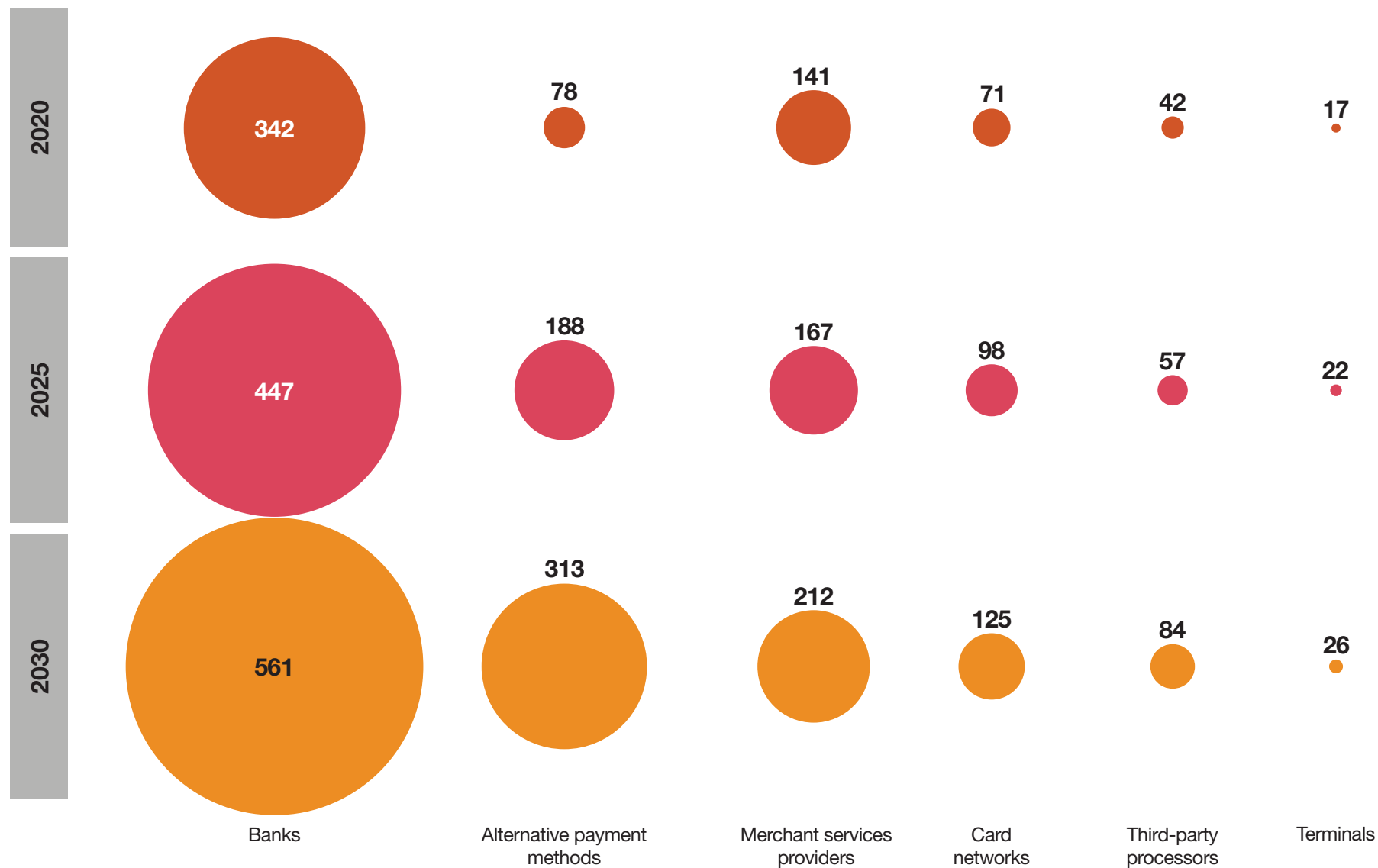
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The rise in mobile payments will put ever-higher premiums on user experience, forcing fintechs and financial institutions of all sizes to deploy technology that can turn complicated back-end infrastructure into easy-to-use consumer and commercial applications.”

Jason Gardner, founder and CEO, Marqeta, a global card-issuing platform

Figure 7: Changes in revenue pools from 2020 to 2030

Transactional revenues in US\$bn



Note: Alternative payment methods include payment solutions from big tech, telecoms and retailers outside or on top of traditional bank and card payments. Revenue figures for 2025 and 2030 are projections.

Source: PwC Strategy& analysis

A new way to think about the future of your business

One of the main challenges at any organisation is determining how to best allocate precious resources to bring about the types of change required to not only manage through the crises of today, but be successful tomorrow. We've created a framework that gives examples of how payment leaders can determine gaps and priorities (see Figure 8).

Accelerated by the pandemic, the shift to a cashless society and the increasingly complex role played by payments create a once-in-a-lifetime opportunity for the payments industry to lead in financial services. At the same time, by becoming a cornerstone of the global economy, payments can serve as a catalyst for economic growth, innovation and inclusion.

You now need to define what your role will be in this evolution. To successfully secure your tomorrow, today, it is critical for you to understand what you need to do to stay relevant and how to improve the customer experience and contribute to a bigger societal purpose.

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As the sector evolves, we need to ensure our current and future payment systems can deliver value and innovation while mitigating systemic risks. Some of the changes involved may unfold in ways we can predict, but many will not.”

Matthew Hunt, COO and Interim CEO,
Pay.UK

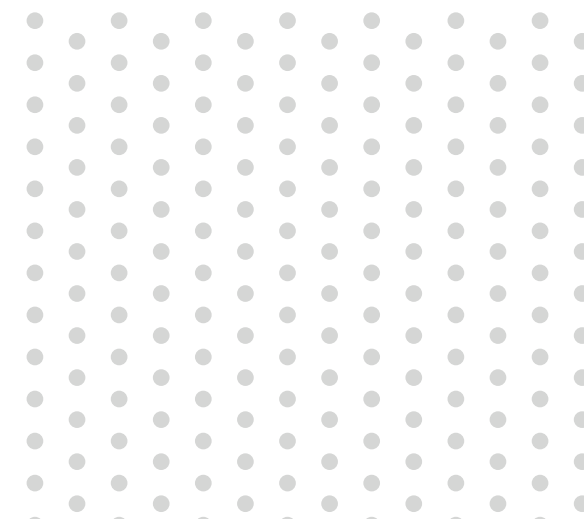


Figure 8: Preparing for tomorrow: The four Rs

Players in the payments ecosystem can plan for success by taking the following actions to determine their gaps and priorities.

	Repair	Rethink	Reconfigure	Report
Banks	Prevent credit risks. Provide payment holidays. Adjust pricing. Limit free offerings (cash withdrawals, checking accounts). Reduce remote service costs (e.g., through enhanced customer self-service options).	Consider whether it's worth competing at all (especially if a mid-sized bank), given global player dominance. Revisit product structure and packages. Reduce dependence on transactional pricing in favour of subscription models. Optimise partner sourcing (cards, processing, correspondent banking). Collaborate with other banks to create dispensing systems that ensure a continued supply of cash at lower cost. Rethink positioning in emerging open banking landscape. Rethink role to account for widening regulatory remit for non-bank players.	Expand into new offerings, including 'buy now, pay later,' cryptocurrencies and central bank digital currencies. Build joint offerings with nontraditional players (fintechs, big tech) to capitalise on regulatory changes. Consolidate processing volumes by outsourcing or insourcing.	Inform customers of the benefits of payment solutions to their businesses and wider society. Report on future roles for payment services inside the bank. Ensure end-to-end transparency. Report on progress in supporting inclusion and digitisation.
Card networks	Adjust cost and investment plans to account for a collapse in pandemic-induced cross-border payments and foreign exchange business. Prioritise solutions that help retailers and merchants enable e-commerce.	Develop strategies for a world increasingly dominated by alternative payment methods. Capture account-based payment flows. Improve coverage and capture of B2B payments. Assess regulatory and other developments to ensure card offerings are best suited to local market needs.	Evolve into a 'network of networks' approach, connecting cards and alternative payments, and local and international payments. Integrate card- and account-based rails into one system, leveraging ISO 20022. Add extra services on top of payment function and offerings. Allow for and engage in local payment processing while maintaining global innovation. Invest in domestic processing in markets where regulators are keen to control processing and data.	Measure and report contributions to financial inclusion, reductions in carbon emissions and the switch to cashless. Leverage data to provide insightful analytics to stakeholders. Provide better insights from transactions to banks and merchants to enable better customer service and business planning.

Figure 8: Preparing for tomorrow: The four Rs (continued)

	Repair	Rethink	Reconfigure	Report
Merchant services providers	Improve e-commerce and omnichannel capabilities to support retailers in their cashless transition. Foster terminal adoption and usage, especially across small businesses. Launch digital sales and onboarding processes. Launch or upgrade merchant portals and self-service options.	Broaden coverage of payment methods. Develop new models and sources of revenue to account for the decline in terminal business.	Upgrade fraud-detection systems and countermeasures. Expand payment to checkout. Drive digital transactions and enable the collection of rich transactional data (e.g., at the level of the stock-keeping unit).	Inform customers of the benefits of payment solutions to their businesses and wider society. Report on future roles for payment services inside the bank. Ensure end-to-end transparency. Report on progress in supporting inclusion and digitisation.
Third-party processors	Adjust operating expenditure to account for reduced transaction volumes (especially in credit). Revisit investment plans and cut spending on legacy platforms.	Plan to transition to a cloud-based, as-a-service model. Develop an implementation road map to enable issuers and merchants to offer virtual, instant, mobile-first products and services. Integrate alternative payment capabilities. Design digital onboarding experiences and prepare for cross-border acceptance.	Upgrade platforms, focusing on configurable, cloud-based architectures. Focus more on the front end by rolling out fully digital, user-friendly interfaces to consumers and merchants. Refocus sales efforts to extend beyond traditional banks and towards digital banks and payment service providers. Continue and step up efforts on cybersecurity and fraud prevention.	Emphasise future-proofing of both business models and the client base in investor relations. Sharpen reporting on fraud and chargebacks as a key differentiator and value lever.
Alternative payment methods	Rapidly enlarge the acceptance footprint. Activate the user base across different scenarios (peer-to-peer, face-to-face and e-commerce).	Explore expanding into a wider ecosystem, either by adopting a super-app approach or by partnering with other firms. Assess potential partnership models, as appropriate.	Expand product offering beyond payments and into ancillary services (customer identity, lending). Integrate offerings into third-party ecosystems. Further fortify offerings by adding advanced mobile, omnichannel, cybersecurity and fraud protection, and analytics capabilities. Enable interoperability across alternative payment methods.	Ensure transparency in data security and privacy. Ensure efforts to contribute to inclusion and digitisation are reported.

Figure 8: Preparing for tomorrow: The four Rs (continued)

	Repair	Rethink	Reconfigure	Report
Terminals	Develop and enhance SoftPOS solutions (software-only solutions on a mobile phone) to support small-merchant capture. Upgrade the capacity for redeployment and refurbishment of terminals to deal with upcoming business failures.	Ensure and enable the compatibility of terminals with alternative payment models. Develop services beyond terminals (bill payments with QR codes, social welfare payments). Consider providing the payment infrastructure for IOT devices.	Establish the infrastructure and partnerships for new services. Reorganise sales and deployment approaches to cater to lower-end markets.	Report on wider benefits of acceptance solutions for inclusion and fraud prevention.
Telecoms and retailers	Add cashless payment methods with more extensive coverage. Enable new forms of checkout ('click and collect,' home delivery).	Make better use of customer data to rethink customer relationship management (loyalty schemes, targeted marketing). Enhance in-store and online experiences by offering digital wallets and other services. Define a unified payment strategy with supporting partnership models across traditional and nontraditional players.	Build or source a customised payment solution across channels and (partially) across geographies. Digitise offerings and enhance virtual experiences, removing dependence on in-person interaction. Implement partnership models with both traditional and nontraditional players to create an ecosystem in which the customer is able to leverage numerous services.	Build a trusted payments brand through clear reporting. Inform customers and regulators about responsible business practices in relation to targeted offerings (loyalty schemes, lending). Report on social impact by leveraging the existing customer footprint to address issues such as financial inclusion.

Source: PwC analysis

Regional trends

Europe

- **From cashless to digital currencies.** A key priority in Europe is managing the transition to cashless payments amid greater acceptance of cards and mobile payments. But some of the larger economies (notably Germany) are still seeing more cash than cashless transactions. The Bank of England, Sweden's Riksbank and the European Central Bank are exploring digital currencies, focused on data privacy and financial inclusion.
- **Battle of the rails.** Europe is making serious steps towards instant payments, fuelling the battle of the rails. The EU has called on banks to offer instant payments across the board by the end of 2021 and has laid out a vision for all payments becoming instant. Some countries, such as the UK and Switzerland, have been pioneers and have well-established, fast payments infrastructures. Instant payments are set to become the backbone of card, mobile and online payments directly from accounts, putting account-based payments into the centre of the payments evolution.

- **European solutions.** Building a European payments scheme for card and online payments, the European Payments Initiative has moved from debate to implementation. The project involves balancing a mix of commercial considerations by banks and retailers, sovereignty concerns of payment supervisors, the innovation needs of banks and a view of payments as a key enabler of a European digital agenda by policymakers. First results are expected in 2021 and 2022.
- **Open banking.** The UK has taken the lead in Europe in giving third-party payment providers access to banks' customer data through application programming interfaces (APIs), with customers' consent, and better protecting user data. The EU is following, with implementation of its second Payment Services Directive. Strategies and scope differ, but there's a clear direction towards non-bank providers such as digital wallets taking larger parts of the front end of payments, account information and aggregation, product comparisons, and loyalty and marketing integration.

North America

- **Real-time payments (RTP).** The long overdue overhaul of North American payment systems is well underway. Canada is modernising its payment system, including through the Real Time Rail initiative, which will be the country's new real-time payment system by 2022. In the US, several initiatives are in progress, including the expansion of instant mobile payments business Zelle, the Clearing House's RTP service, and the Federal Reserve's FedNow payment service, planned for launch in 2023. Looking to 2025 and beyond, RTP represents one of the most significant opportunities in payments for some time. Combined with continued advancements in digital engagement, increased RTP usage for bill payments, peer-to-peer remittances and traditional debit purchases are all anticipated to be significant growth areas.
- **Interchange, and no battle of the rails (so far).** Most card interchange in the US continues to operate by free market principles, unlike in other regions, where interchange is often regulated. On the back of a strong card legacy in North America and the pervasive use of (and, for some, need for) credit as a form of payment, we anticipate a slower and more gradual shift to

alternative payment methods than is happening in other regions. Additional headwinds against such a shift include strong rewards programmes on spending and a highly competitive market among card issuers laden with attractive incentives for consumers to switch card products.

- **Integrated payments.** North America has led the growth of more integrated payment solutions. The emergence of integrated software vendors that integrate business management capabilities with payment solutions for small and medium-sized enterprises has transformed how payment services are sold, with significant implications for 2025 and beyond. As software continues to become more important than hardware, traditional point-of-sale (POS) providers will be pushed to the edges, leading key stakeholders to engage in M&A and increase innovation budgets in order to expand their range of POS solutions.
- **Digital currencies.** The year 2020 proved to be the moment when digital currencies attained a degree of legitimacy in North America. Payment networks and digital wallets, such as those offered by Mastercard, Visa and PayPal, have started enabling transactions with cryptocurrencies, and Facebook is pursuing a global project with Diem. Some enterprises have also said they will accept digital currencies as a form of payment (or buy digital currencies and deliver shareholder returns in a depressed interest rate environment). Despite the prospects and in light of a cautious regulatory approach, and given the competitive landscape across consumer payment options, digital currencies will likely make up a small percentage of personal consumer expenditure by 2025.

Africa

- **Inclusion and trust.** In Africa, banks, mobile operators and retailers are taking the lead in equipping consumers with cashless means of payment. They're also playing a key role in bringing about financial inclusion and trust in digital payments. Regulators, too, are stepping in to drive financial inclusion. It is being strengthened by the need of many African migrant workers to send money home via affordable cross-border payments. Mobile money solutions such as Mama Money, an international payments app in South Africa, and others offered by retailers are making cross-border payments affordable and convenient. To keep up with the competition, banks are increasingly focusing on a mobile-led transformation to reach financially excluded populations.
- **Mobile money rather than wallets.** Alternative 'closed loop' systems, such as e-money and telecom-led mobile money solutions, will continue to dominate a large proportion of the African continent, especially sub-Saharan Africa, due to the foothold mobile money agent networks have already established. This trend will persist, with more financial-services offerings built on top, such as those offered through M-Pesa, the Kenya-based mobile payment service. The rise in mobile payments has further led to wider adoption of QR code payments. In 2020, Ghana became the first African country to introduce a universal QR code. In South Africa, the Payments Association of South Africa (PASA) has identified a need to streamline the experience of both payer and payee and is in the process of standardising QR codes across the sector.

- **Battle of the rails.** Account-to-account credit transfers are likely to continue growing across Africa, given enhancements to the national clearing infrastructure focusing on low-value, high-volume payments such as the Rapid Payments Programme (RPP) in South Africa. Instant clearing is a key feature of RPP, which has its roots in the requirements of the South African Reserve Bank's Vision 2025 road map and PASA's Project Future initiative. BankservAfrica, the largest African automated clearing house, in partnership with the payments industry, is driving the implementation of a payments platform to deliver an instant payment solution to the market, while deepening digital financial inclusion. Ghana has seen significant growth in GhIPSS Instant Pay, an electronic payment system that enables instant payments between bank accounts or wallets. Nigeria and Kenya have also introduced instant payments.
- **Digital currencies.** South Africa has embarked on its second CBDC project to explore the use of both a wholesale CBDC and a wholesale settlement token for interbank use.

Latin America

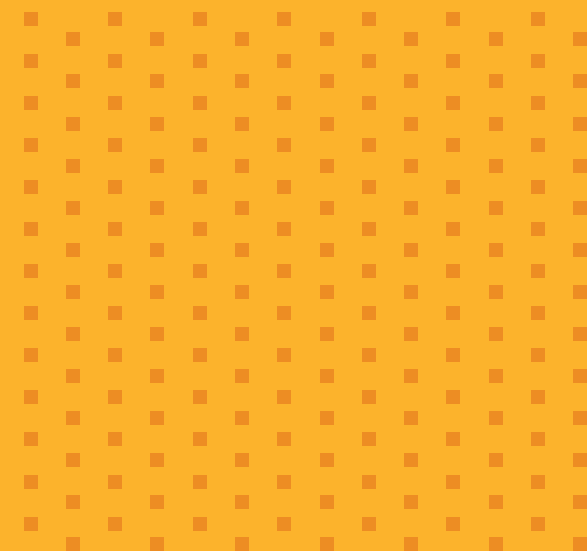
- **Inclusion and trust.** Latin America is at the forefront of financial inclusion, thanks to central bank and government leadership in initiatives promoting new payment technologies, interoperability, cost reduction and open competition. QR code payments in the region are helping to leverage underlying instant payments infrastructures, providing easy and cheap access to digital payments, through either a traditional POS device or a mobile phone to both merchants and consumers.

- **Battle of the rails.** All regulators are progressing in creating RTPs and fostering higher levels of interoperability within the ecosystem, although with different approaches and at different levels of maturity. New initiatives by regulators—such as CoDi in Mexico, Pix in Brazil and Transferencias 3.0 in Argentina—are leveraging alternative rails. This means that card operators could lose volume over the next five years if transactions migrate from their rails to the new, alternative rails. Given these new, alternative payments infrastructures and the fact that there are also new, wholly cloud-based providers challenging traditional local players, banks are already re-examining their underlying card processing models and providers across the region.
- **Acquiring model evolution.** The licensing of payment service providers is bringing new competition into the market as banks reconsider their former interbank setup on the issuing side. At the same time, banks are moving from monobrand to multibrand acquiring.
- **Digital wallets.** Numerous players are vying for a share of consumers' payments, and state-owned banks have launched digital wallets to channel social and pandemic-related subsidies to people, as well as to promote discounts for their users. This is helping scale up adoption of digital payments, especially among people with no previous experience of banks. Marketplaces such as Mercado Libre, with its Mercado Pago service, are launching their own ecosystems in which merchants and individuals can do business and meet personal financial needs.

Asia

- **Financial inclusion.** Use of digital payments in e-commerce across the ten countries of the Association of Southeast Asian Nations, use of digital remittances by overseas workers in sending funds back home to the Philippines, and the explosive growth of Singapore-based ride-hailing and payments app Grab have all highlighted the power of payments to empower people in the region.
- **Digital wallets.** Digital wallets are a big trend in Asia, with wallets used not only to access funds stored elsewhere (on a card or in a bank account) but also to store money. Digital wallets are often embedded into wider solutions and super-apps, such as GrabPay or GoPay. Some countries, notably Indonesia, are promoting QR-based mobile wallets to drive consumer and merchant inclusion.
- **Digital currency.** China has made an early start on developing a digital currency, in 2020 testing a digital renminbi with several urban pilots involving what is known in China as digital currency electronic payments. The currency might incorporate secure technologies such as blockchain, along with near-field communication capabilities that allow offline money transfers when two wallets (typically mobile devices) touch. However, India has cast doubt on digital currencies; pending legislation could ban the concept in this country of nearly 1.4bn people.

- **New payments infrastructure.** The Indian digital payments sector has seen extraordinary growth in the past few years, with the volume of transactions growing at an average CAGR of 23%, according to PwC India analysis of data from the Reserve Bank of India and National Payments Corporation of India. Growth in digital payments has been driven by multiple factors, such as the launch of new and innovative payment products, increasing smartphone adoption, a growing need for faster payment modes, and a strong push from government and regulators towards adoption of digital channels. The launch of new and innovative payment products such as Unified Payments Interface (UPI), National Electronic Toll Collection (NETC) and Bharat Bill Payment System (BBPS) have firmly placed the digital payments industry on an upwards growth trajectory.



Global perspectives on the future of payments

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There are two main rails in Europe: cards, which represent an old and expensive legacy infrastructure, and the newer model of instant payments, which is the real engine by which Europe's independence on payments infrastructure can be built.”

Stefano Favale, Global Head of Transaction Banking Department, Intesa Sanpaolo

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Achieving a global standard for payments infrastructures and services is a formidable challenge and will take an unforeseeable amount of time. Nevertheless, I believe that by 2025, through the European Payments Initiative and CBDC initiatives, we may be able to establish a standard European solution alongside solutions at the national level, which may involve banks forming consortia to bring their collective payments expertise to the table.”

Luca Corsini, Co-head, Global Transaction Banking, UniCredit

In Germany, we have experienced shifts in consumer behaviour and expectations even more acutely than many of our European neighbours as a result of COVID-19. However, while the transition to digital has been accelerated, the future of retail payments will continue to be defined by solutions delivering superior convenience, speed and security at the lowest price possible. European initiatives such as the European Payments Initiative are therefore necessary for the region's banks and acquirers to realise synergies to compete in a global payments industry dominated by an oligopoly of international payments service providers.”

Dr Joachim Schmalzl, Managing Board Member, German Savings Banks Association, DSGV, and Chairman of the Board, European Payments Initiative Interim Company

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India has witnessed major innovations and enhancements in the digital payments domain over the past few years. We will continue to see further evolution as payments players innovate and go beyond payments to offer other related financial products to address the changing customer and merchant preferences.”

Ravindra Pandey, Dy Managing Director (strategy) and Chief Digital Officer, State Bank of India

Commerce-integrated payment experiences will make payments truly invisible to users, and will be driven by technology advancements such as AI. Simple voice commands and behavioural identification have the potential to create hyper-convenience and hyper-personalisation, while the onus is on the industry to protect the interests (security, privacy, etc.) of users. Further, the ease of instant payments, now experienced on domestic shores, will be expanded to international payments as well.”

Praveena Rai, COO, National Payments Corporation of India

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The payments industry is a dynamic environment with new platforms, products and services. Elo plays a pivotal role in this ecosystem as a technology hub that integrates traditional and new players, leading to innovative, agile, flexible, and secure products and solutions.”

Vilma Lorey, Operations Director, Elo

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In coming years, we will see, and lead, a profound transformation in payments and financial inclusion in Latin America. With increasing smartphone use, we will actively promote access to payment solutions via mPOS of various kinds, QR codes, NFC technology, virtual cards and digital accounts—for payments, P2P transfers, credit and investments—both for personal and commercial use. Education is fundamental for financial inclusion, and we are promoting different platforms and content to reach everyone.”

Paula Arregui, Senior Vice President and COO, Mercado Pago

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The fundamental shift we are living through is towards consumer autonomy, involving touchless or automated retail—effectively a fully self-driven buying journey. At the same time, the consumer expects advice and assistance almost in real time. We need to adapt and adjust to that changing behaviour.”

Jean-Marie Dragon, Head of Payments and Card Business, Payments and Cash Management Department, BNP Paribas

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Digitisation is affecting the entire economy, and payments are no exception. Consumers are looking for a seamless, connected shopping experience in which payment is integrated, fast and reliable. Our customers are looking for personalised shopping experiences, while still being very sensitive to the protection of their personal data. Banks are particularly well placed to ensure the universality, privacy and security of digital payment paths.”

Bertrand Chevallier, Director General, Crédit Agricole Payment Services

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