THE EUROPEAN PAYMENTS LANDSCAPE IN PERSPECTIVE

2020 REPORT

EPA EU EMERGING PAYMENTS ASSOCIATION

LuxembourgforFinance
Agency for the Development of the Financial Centre

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The Emerging Payments Association EU A.S.B.L (EPA EU) is a non-profit association of payments industry influencers based at the "LHoFT" in Luxembourg.

The purpose of the Association is to promote and defend the interests of its members and as well as the study of any issues concerning the payments industry in the European Union.

EPA EU builds on the international network of our London-based sister organisation, the Emerging Payments Association (EPA), consisting of 150 members from across the payments value chain; including payments schemes, banks and issuers, merchant acquirers, PSPs, retailers, and more.

EPA EU seeks to achieve its objectives by organizing events, managing projects defending the interests of its members, publishing research documents and providing training.

Collectively, members of the EPA transact more than €6 trillion annually and employ more than 300,000 staff, meaning that we now have a significant influence over the industry's future.

EMERGING PAYMENTS ASSOCIATION EU A.S.B.L.
"The Lhoft" 9, rue du Laboratoire L-1911 Luxembourg

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"Change – in financial services generally, and payments in particular – is happening so fast, there are no guarantees as to what the future will look like."

INTRODUCTION

Change – in financial services generally, and payments in particular – is happening so fast, there are no guarantees as to what the future will look like.

In particular, the arrival of the global COVID-19 pandemic is likely to trigger profound economic shifts, as strategists from the UN, McKinsey[1] and various think-tanks have noted. Payments will not be immune. For example, it is not a stretch to suggest that COVID-19 will hasten the shift from card payments at POS to contactless digital wallets, both in-store and online. While this shift was already underway before the pandemic, the absence of a requirement to key in PINs and/or codes has made contactless payments more popular, in particular via digital wallets. Indeed, at the time of writing, governments across Europe and North America have already increased the limit for contactless transactions by 50% to prevent consumers from having to use keypads so often.

That shift, in turn, has implications for how we structure and implement digital ID systems in both the physical and online environments; which means more investment in new payments technologies. In recent years, investment in financial technologies (FinTech) relating to payments has outstripped other tech investments in financial services by a factor of two to one. The pace of change means the disrupter can become the disrupted very rapidly. For example, while cards continue to replace cash, cards themselves are now at risk of being replaced by digital wallets such as Apple Pay and Google Pay, mobile systems (e.g. AliPay and WeChat), and account-to-account systems such as Trustly.

Meanwhile, the banks behind the card schemes are themselves under threat from a wave of neobanks, or digital-only banks such as Revolut, N26 and Monzo. Unheard of ten years ago, more than 20% of US households now use neobanks, with a further 8.8% planning to open neobank accounts this year.[2] Faced with such competition and supporting an unsustainable cost base, Europe's "bricks and mortar" financial institutions are reducing in number, and their branch networks are slowly declining as internet banking becomes the preferred way to bank.

Younger consumers born after 1998, who have grown up with the internet and digital technologies, overwhelmingly prefer contactless payments and remote payments to the traditional use of cash or cards – though to provide a note of calm, debit cards remain Europe's preferred way to pay across all age groups.

[1] For the McKinsey study, see https://www.mckinsey.com/business-functions/risk/our-insights/covid-19-implications-for-business

[2] See https://www.emarketer.com/content/seven-charts-the-state-of-digital-banking-in-2020

Introduction

> **"Younger consumers born after 1998, who have grown up with the internet and digital technologies, overwhelmingly prefer contactless payments and remote payments to the traditional use of cash or cards."**

Even those ideas which we might think of as revolutionary – such as shopping online – are now commonplace. In just ten years, online shopping has become the norm for Europeans, with the question now being how much of that shopping happens when users are on the move through mobile devices. Beyond that, the phenomenon of faster payments which allow for instant transfer and settlement looks set to make an impression on international money transfers. This offers the possibility of transferring funds from Brussels to Shanghai in seconds, rather than days. And then there are the almost science-fiction possibilities of paying with your finger or your face...

New challenges are emerging in this digital landscape: ensuring that payments are safe, that our personal data online is protected, and ensuring the cross-border payments landscape is quick, seamless, and at a low cost all over the planet.

In the following pages, we offer an overview of global trends looking at some of the world's leading payments markets, followed by a focus on key European markets and regions. As a result, this study aims to provide a survey of the rapidly changing payments landscape around the world, comparing and contrasting the uptake of fintech in the payments sector in multiple geographies. It also looks at environmental factors supporting (or hindering) the emergence of new methods of payment. In doing so, it attempts to provide clues as to why some geographies are approaching fully cashless societies, while elsewhere paper notes remain de rigeur.

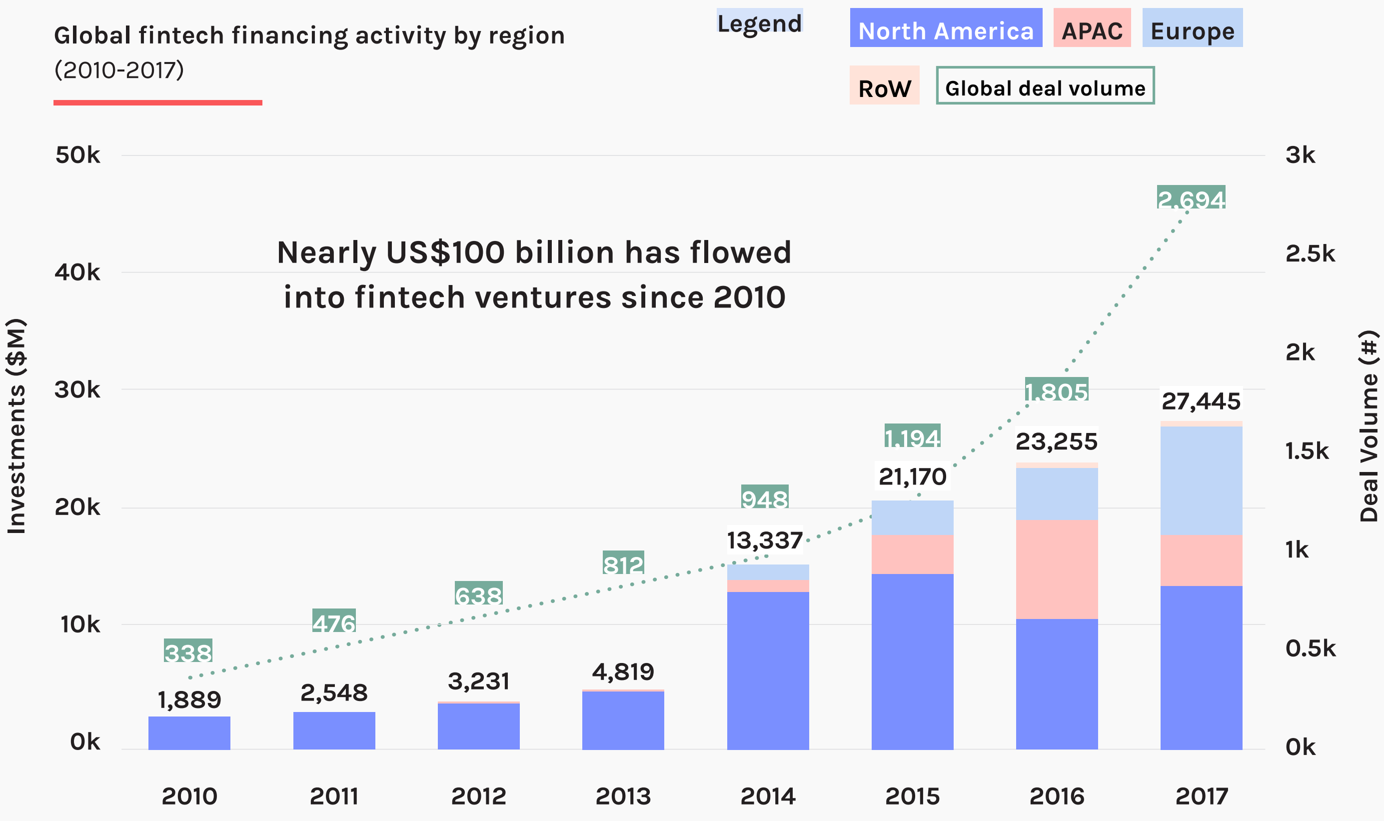
North America: Capital and Innovation

> "The US card business is under attack from big tech and nimble digital players."

The USA – a tale of two markets

Still clinging on to its crown as the world's largest economy despite fast-growing competition from China and India, the USA is also one of the main global centres for innovation in payments and the world's largest single-nation market for payments by transaction value. Set against this backdrop, however, is the uniquely fragmented state of US banking, and a paucity of industry-led initiatives to develop a coherent payments infrastructure. As a result, there has been a historically slow adoption of new technologies such as the EMV card standard[3], chip and PIN technologies, and now digital ID standards. It seems as though this history of confused standards is now repeating itself in Faster Payments, with the Federal Reserve proposing a national system (FedNow) and the private sector offering alternative solutions[4].

Global fintech financing activity by region
(2010-2017)



Source: Accenture Research analysis of CB Insights data

[3] EMV, introduced by Europay, MasterCard, and Visa in 1994, is a secure technology that is used worldwide for all payments done with credit, debit, and prepaid EMV smart cards. It can be used in three forms: contact, contactless, and mobile.

[4] https://www.reuters.com/article/us-usa-fed-payments/fed-to-develop-real-time-payments-system-for-launch-in-2023-or-2024-idUSKCN1UV1XP

North America: Capital and Innovation

Innovation starts here

North America has consistently outstripped the rest of the world when it comes to FinTech investment over the past decade. And with payments accounting for twice the number of dollars invested in any other category of FinTech, the US has every right to see itself as one of the global leaders in payments innovation. Indeed, the 2020 Finexable Index of the world's FinTech hubs[5] puts four US cities in the top ten for capital availability, talent and ecosystem.

Big tech muscles in

Alongside this capital investment, major US technology firms are beginning to threaten traditional banks' positions in payments. Although Samsung, IBM and Intel have all made moves into payments, with Samsung's mobile wallet gaining some traction, there is little doubt that the four tech giants – Google, Amazon, Facebook, and Apple, ("GAFA") are also targeting the entire payments spectrum, from virtual currencies to credit cards, intermediation services and P2P.

Facebook has seen its payments revenues rise 42% between 2018 and 2019, and announced the launch of its "Libra" consortium, intended to create the world's first global crypto-currency (a so-called "stablecoin"). However, by October 2019, Visa, Mastercard, eBay, Stripe, PayPal and Mercado Pago had all withdrawn from the Libra Association. In April 2020, The Libra association has published a second version of its white paper offering single-currency stablecoins in addition to the multi-currency coin they had initially proposed. The company has also been trialling payments over WhatsApp in India since January 2018.

For its part, Apple's Apple Pay wallet is now accepted in 60% of US retail locations. Apple now sees Apple Pay as a growth machine, with revenue and profitability growth, if not raw dollar numbers, now outstripping Apple's hardware and software offerings. Though markedly less successful than its rival's scheme, Google Pay is now more likely to be used in online transactions than other fast-rising digital wallets like Venmo and Zelle. Meanwhile, online retailing giant Amazon launched a small-business lending platform offering loans of up to $750,000 in 2011, with more than $3 billion in loans to 205,000 small businesses by February 2020. A suite of personal insurance products – Amazon Protect – is now also available, and the firm has begun establishing a physical presence to match its virtual dominance.

Big – but breaking

Put simply, the US credit and debit markets are enormous. The US debit card market was worth more than $3.03 trillion in 2018, and outstanding balances on US credit cards came in just under $1 trillion at the end of 2019. The top ten issuing banks collectively saw growth of 3.74% in the number of open accounts, and there were more than 280 million open credit card accounts at the end of 2018.

[5] See https://findexable.com/

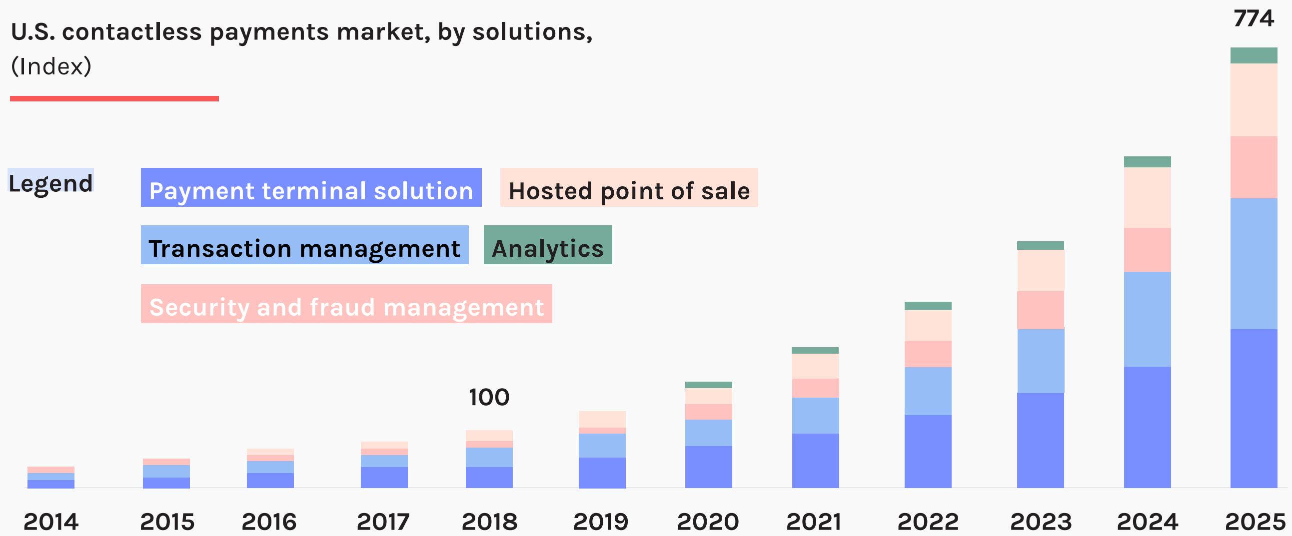
North America: Capital and Innovation

Yet despite these positive growth stories, the US card market suffers from some significant deficiencies compared with Europe, and other regions such as Asia. First and most obvious among these challenges is the highly fragmented nature of America's issuing business. Although the top ten card issuers in the US account for 88% of all cards, there is a long tail of smaller issuers, with 14,000 financial institutions in the country making up much of the remaining 12% of cards. This fact alone, coupled with a regulatory and legislative distaste for collective action, has historically made the US payments business slow to act when it comes to industry-wide measures such as the move to the EMV standard and chip-and-PIN protection for consumers at point of sale (POS). The US was one of the last major markets in the world to complete the move to Chip and PIN, only doing so when POS fraud had begun to migrate towards the US from markets that had already moved to EMV.

The way ahead

As new technologies and alternative payments such as contactless cards and digital wallets begin to take off through 2020 and beyond, the US appears to have learned lessons from its experience as a laggard in the move to EMV. A US Faster Payments Council has been established to lead the drive towards Faster Payments, and US firms are taking the lead in the introduction of Artificial Intelligence (AI) and Machine Learning (ML)-based solutions to combat payments fraud. Mastercard and Visa have both pivoted from being card networks to establishing themselves as technology companies focused on payments, and a growing number of merchants are enabling their payments infrastructure for contactless cards. Despite these facts, the US remains far behind Europe and Asia in its take-up of contactless technologies.

U.S. contactless payments market, by solutions,
(Index)



Source: Grand View Research, Inc.

North America: Capital and Innovation

One significant concern for the "traditional" payments sector in the US is the huge popularity of digital account-to-account payment schemes like Trustly, with one estimate putting its US growth rate in 2019 at around 600%. Although such growth comes from a very starting point, the fact that most users of such schemes are in the 18-35 bracket cannot be reassuring for the US banking industry, especially at a time when the profitability of credit cards has halved in the past decade despite more favourable interchange rates than Europe, according to Deloitte[6]. The US card business is under attack from big tech on the one hand, and from nimble digital players on the other. While its dominance is not yet under threat, the North American payments landscape will look dramatically different in 2030 compared to the card-led business we see today.

[6] See full report from Deloitte at https://www2.deloitte.com/us/en/insights/industry/financial-services/consumer-payment-survey.html#credit-card-economics-time-for-a

The dawn of the Asian century?

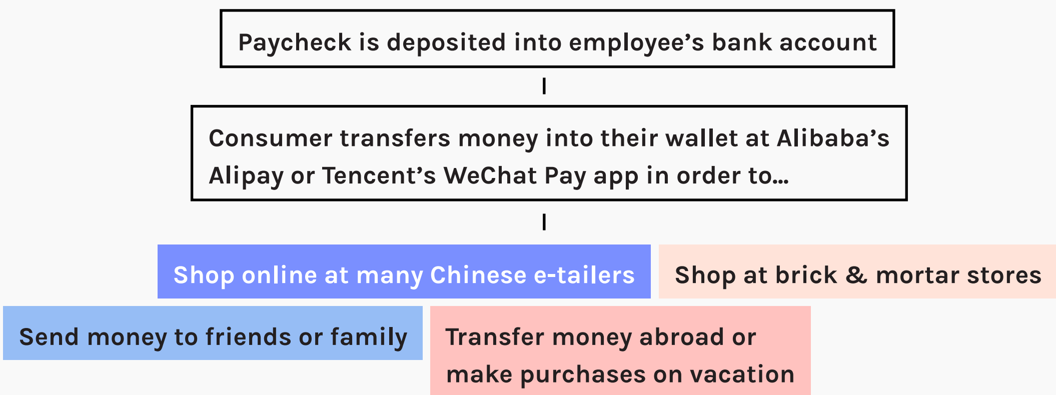
> **"UnionPay enjoyed a virtual monopoly in the country's electronic payment systems, with more than 6 billion cards in issue as of June 2019."**

In January 2019, management consulting firm McKinsey[7] caused a stir with its prediction that demand-led growth – that is, consumption of goods and services – would pivot to Asia in the years ahead. It was predicted that consumption in China and other countries will soon outstrip traditional consuming markets such as the US and EU. The knock-on effect will be to turn Asian economies into world leaders, with the West supplying expertise and capital.

China

When it comes to payments, some say this is already happening. One year ago, Bloomberg published a detailed analysis of Chinese digital payments giants WeChat and AliPay. These systems come from established digital platforms and are now primarily distributed via mobile devices. This means that they can bypass traditional payments systems infrastructure and have been responsible for large reductions in the card fees earned by Chinese banks.

How China's payment system works



Source: Bloomberg Reporting

[7] See https://www.mckinsey.com/featured-insights/future-of-asia

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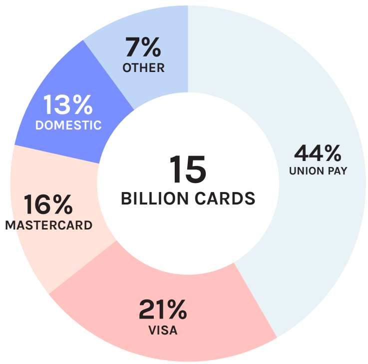
In some ways, though, comparisons with Western payment systems are unfair, given that WeChat and Alipay have been able to build up large domestic user bases in an environment that was not open to foreign competition. This enabled these digital players to build up significant revenue and profitability prior to their internationalisation – just as UnionPay was able to do in the card business. Digital payments in China were also further supported by the presence of a government-mandated digital ID and close monitoring of the internet, factors that dramatically reduced the incidence of fraud via digital payments and improved consumer confidence from the outset. These measures are of course not directly replicable outside of China.



Share of Payment Cards Worldwide by Scheme, 2017

Source: Global Payment Cards Data and Forecasts to 2023 (RBR)

Part of the Union

Prior to the advent of digital payments (which account for more than a third of all transactions in China), UnionPay enjoyed a virtual monopoly in the country's electronic payment systems, with more than 6 billion cards in issue as of June 2019, and an acceptance network that reaches 178 countries and 41 million merchants – despite "only" 15 million of these being in China.

Modelled on the old Visa and Mastercard membership approach, UnionPay was able to build up significant strength thanks to its dominance inside China, initially extending its issuing and acquiring networks into other Asian markets. In recent years, though, UnionPay has increasingly spread its wings beyond China and adjacent markets. Responding to demands from Chinese tourists travelling internationally, the company has focused on expanding its acceptance network to serve tourist destinations. UnionPay's growth has been achieved to a large degree by partnerships with domestic acquirers. Perhaps the clearest sign of UnionPay's growing strength, however, has been the announcement in June 2019 that the company would begin issuing cards in Europe. UnionPay announced its partnership with Tribe Payments, a UK-based back-office technology start-up, to allow banks and fintechs to start offering individuals and companies its branded cards.

All the chat

WeChat, which in common with Alipay offers consumers a wide range of services associated with payments – such as insurance, loyalty schemes and others - began its internationalisation strategy promisingly enough, electing to focus on high-growth emerging markets in Africa and Latin America. However, a 2018 campaign to encourage usage in Argentina and Colombia was not a success, and usage of WeChat in the US, Malaysia and

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even Singapore has not taken off – despite WeChat's internationalisation budget of $290 million.

However, Tencent, the owner of WeChat, is focusing on improving international acceptance for WeChat by partnering with specialist acquirers such as RiverPay and Finablr. RiverPay claims to have seen growth rates in WeChat and AliPay acceptance of more than 20 times between 2018 and 2019, as high-spending Chinese tourists attract merchants globally. In another echo of UnionPay's strategy, increasing acceptance of WeChat focuses on high-end hotels, ultra-premium merchants, and transit locations like duty free boutiques and airport lounges.

Sharing is caring

Like WeChat, AliPay has seen rapid growth in its acceptance network through collaborative partnerships in closely-targeted international locations and Ant Financial, AliPay's parent, has experienced more success in building its user base than WeChat. Ant Financial has also seen potential in emerging markets – but elected to invest in pre-existing solutions such as India's PayTM and Mynt, an e-wallet for smartphones in the Philippines. In taking this approach, Ant have met with much greater success: its financial clout has helped PayTM grow from a user base of 25 million to 350 million users in India[8], while Mynt has been able to expand from being a pure-play e-wallet to offering other services such as transfers, micro-loans and credit scoring thanks to AliPay's involvement.

Most recently, Ant acquired the UK's WorldFirst money transfer service for $700 million, opening up a new revenue stream for them in the UK, US and other countries. The fact that these Chinese firms are capital-rich does not make their internationalisation easy. Ant Financial's attempted 2017 takeover of MoneyGram for $1.2 billion was blocked by the US government, and other blockers, such as data privacy regulations, technological issues and plain old cultural differences, mean that the road ahead for Chinese firms looking to grow internationally will not be straightforward.

India

India's population of 1.4 billion and the high penetration of mobile devices in the country has made it an attractive market for digital payments, where the aforementioned PayTM and other players have made great strides. They have been assisted in their growth by the Indian government's proactive approach to digitisation, which has included the launch of a demonetisation strategy in 2016, alongside the introduction of a Universal Payments Interface (UPI) by the National Bank of India. These developments have been complemented by a national digital ID system, Aadhaar, and the introduction of a government-sponsored digital banking system to support digital transactions for the unbanked and rural populations, effectively drawing these groups into the financial system. Google is not alone in having seen the potential of India's payment system, with the global giant's Tez (effectively a rebrand of

[8] See https://www.ft.com/content/0788d906-1a7b-11ea-97df-cc63de1d73f4

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Google Pay) finding great success in recent years as India's consumers awaken to the possibilities of digital payments. As with Chinese firms seeking to internationalise, however, India's path to digital payments has not been without its challenges, as user impersonation and digital ID theft have grown rapidly alongside the country's burgeoning digital payments sector.

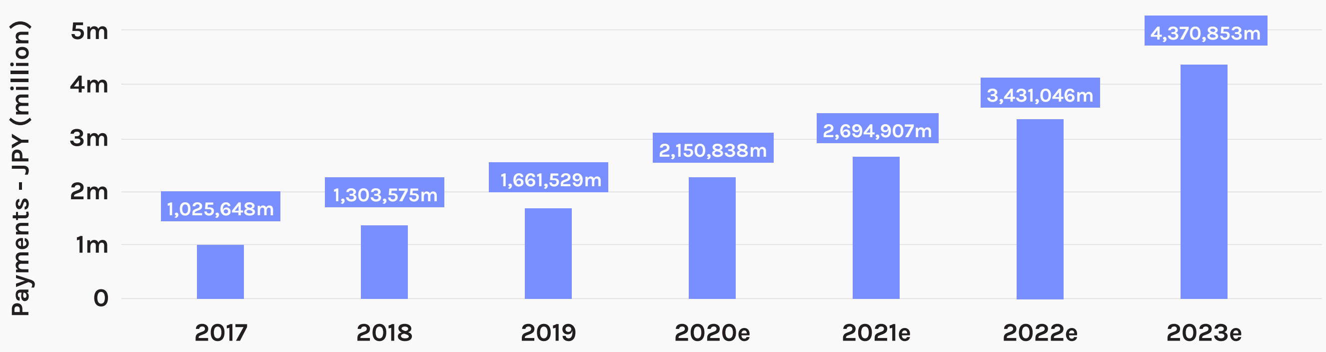
Japan

When it comes to payments, the Japanese player most of those outside the industry will have heard of is JCB. Founded in Japan in 1961, JCB now has 123 million cardholders around the world, including 8 million premium cards. Its internationalisation strategy focuses on partnerships for outbound acquiring, technological expertise and acting as a partner for North American and European merchants looking to take advantage of the boom in Asian e-Commerce and tourism. Accordingly, the company negotiated a tie-in with Discover card in the USA which saw JCB handle acceptance for Discover and Diners' in Japan, with Discover returning the favour in the US.

Central to JCB's attraction for merchants is the very rapid growth rate being experienced in Asian cardholder spending: consumers from Asian countries are predicted to generate more than $32 billion in additional spending by 2026, and JCB has reported solid growth in average transaction values in many European markets.

Remarkably for the country that created the QR-code, Japan has not seen the same huge surge in digital payments as in neighbouring China. In part this is because the country has historically had a more open economy than China; in part, also, because there is no government-mandated digital ID to smooth the economy's passage into the digital era, as seen in China. However, new companies are emerging from Japan which are successfully internationalising mobile payments, such as LINE. Originally conceived as a peer-to-peer chat app, in 2019 LINE has invested $182million in mobile payments services. Taken together, mobile and QR-code payments in Japan are now well on the way to challenging the dominance of cash in the Japanese payments market.

The mobile payment market size in Japan (Est.)



Source: Yano Research Institute Limited

The dawn of the Asian century?

> **The South Korean market has an extremely high penetration rate for electronic payments. There are more than 100 million cards, representing an average of four cards per Korean household.**

South Korea

The South Korean market has an extremely high penetration rate for electronic payments. There are more than 100 million cards, representing an average of four cards per Korean household. These are used to make purchases worth around $600 billion, and some 76% of retail payments are made with cards, a far higher proportion than in the US. In addition to Visa, American Express and MasterCard, there are several other card brands operating in South Korea – such as BC Card, Lotte Card, and T-Money.

However, as in other markets, South Korean card payments are now being taken over by mobile wallets and digital payments, which have experienced consistent growth rates of more than 150% per year since 2016. In Korea, the mobile payment model was initially launched as a way to make the online credit card payment process easier. With this goal, mobile giant Kakao introduced Kakao Pay in 2014, while Naver, Korea's leading portal site operator, launched N Pay in 2015. Similar to US-based Paypal, users register their credit cards on N Pay or Kakao Pay, and they are then able to make purchases at compatible online shopping sites using just a passcode or fingerprint scanning, bypassing the complex authentication process previously required for online card purchases.

Since that time, the South Korean government has introduced its own system, Zero Pay, and has sought to incentivise usage by offering zero sales tax on purchases using this system. Given that South Korea has one of the most tech-savvy populations on Earth, the fact that they are among the world's fastest-growing users of mobile payments can be of little surprise.

We appear to be only at the beginning of a much greater presence, from the perspective of international markets, for Asian card businesses such as UnionPay and JCB. Whether their developing presence in acquiring transactions– which will help to build brand awareness with Western consumers as much as Asian travellers – will translate into long-term issuing success in Western markets remains to be seen. What's more, the Asian digital payments giants seem to face a raft of challenges, from regulatory compliance to technology localisation, suggesting that plans for them to dominate Western payments are a long way off. The most likely scenario, some way away from McKinsey's "pivot to Asia", is a rebalancing that will see established Western firms continue to play a significant role alongside their Asian peers. In that regard, Mastercard received agreement in principle to begin exploring a joint venture in China in February 2020, and American Express had

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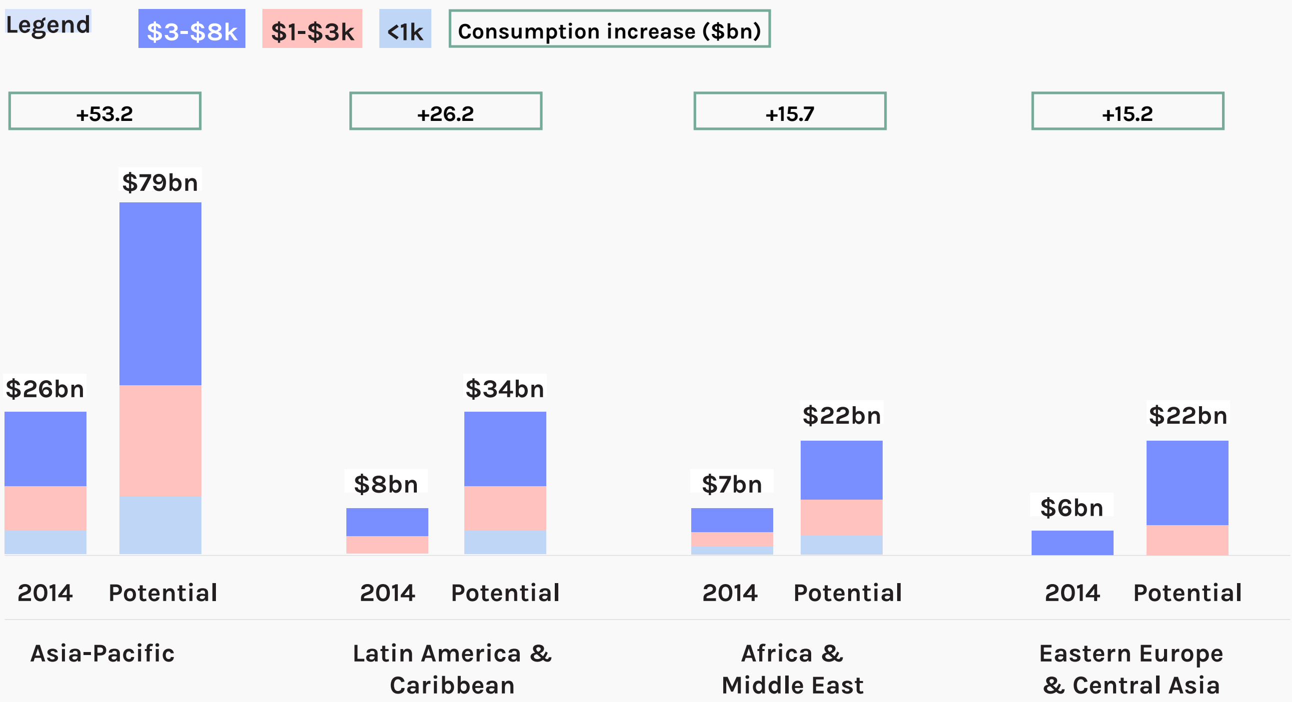
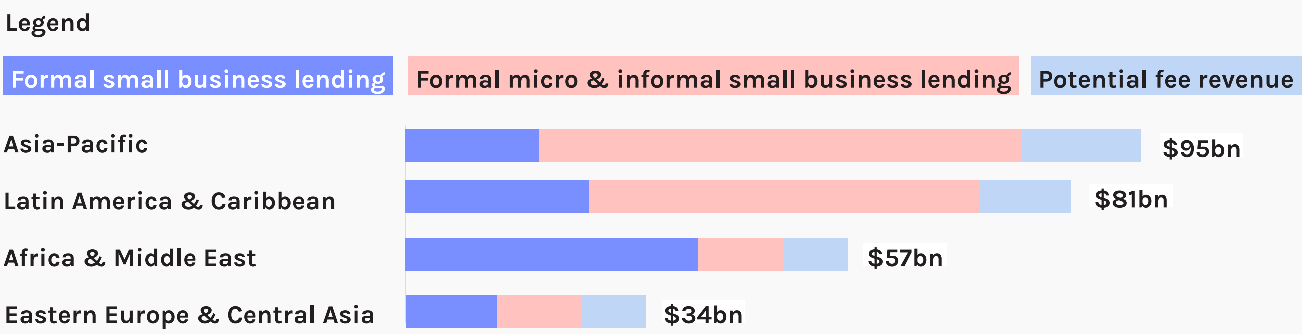
$380BN Opportunity for Banks in Emerging Markets Estimated financial services consumption increase through full banking penetration and increased utilisation by adult population

Personal Banking
Income band of adults (per annum)



Micro and Small Business Banking



Source: Accenture / Worldbank / Global Findex

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its application to begin operations in China accepted in early January 2020.[9]

South East Asia: the unbanked opportunity

At the same time as Chinese and Japanese payments giants make strides across the globe, another opportunity is emerging in Asian markets: the unbanked. A study from Raconteur[10] research estimates that globally, the unbanked populations of Asia, Africa and the Americas constitute a $380 billion revenue opportunity for the financial services industry, with the bulk of this opportunity coming in Asia.

In markets such as Indonesia (population 272 million) and Vietnam (population 100 million), as much as 25% of the population is either unbanked or underbanked; that is, they do not have sufficient access to financial services to allow them longer-term security. Solutions to serve these markets are emerging from digital technologies that bypass traditional card rails and combine payments with other services, including micro-lending, loyalty schemes and credit scoring facilities for both consumers and micro-merchants.

One such scheme, launched in July 2019 in Vietnam is SmartPay, a digital wallet for mobile devices set up by Vietnam's SmartNet and OpenWay, a European payments software platform. Operated entirely on the digital communications network, SmartPay is targeted at Vietnam's 25 million unbanked citizens and the six million micro-merchants who serve them. In its first nine months of operation, SmartPay has picked up more than 750,000 consumers and 60,000 merchants in both physical locations and online. Schemes like this are introducing millions of Asian consumers to the benefits of electronic payments and e-commerce, and will constitute a significant part of Asia's economic development in the decades ahead.

[9] See Bloomberg, https://www.bloomberg.com/news/articles/2020-01-09/amex-moves-step-closer-to-entering-china-s-27-trillion-market; and https://asiatimes.com/2020/02/mastercard-gets-green-light-in-china/

[10] See https://www.raconteur.net/infographics/banking-the-unbanked

Europe: a fragmented landscape

"Cards are now the norm in payments – however, their dominance appears to be peaking."

There are still fundamental differences in the payment habits of Europeans arising from cultural or behavioural factors, as will become clear in the following country by country analysis. As individual factors, we can cite credit aversion whose sources can be traced to monetary history or social (or even religious) norms. Another factor for consumers is their growing appetite for e-commerce, which is undoubtedly the main reason for the adoption of new means of payment as in other parts of the world.

Nevertheless, in Europe, this trend is reflected very differently from one European country to another. Some prefer to rely on traditional credit cards, others on one form or another of debit or even pre-loaded e-wallets, with hundreds of variations on the same themes. It should also be noted that traditional banks compete with fintechs in terms of innovation and, thanks to their size, will often be the ones imposing a new local standard.

Another fundamental factor - at the country level - is how local banks have been able to work together to build common infrastructure (card scheme, ATM network or even e-ID norms) through distinct entities. Where they have not done so voluntarily, market forces have resulted in the same outcomes through consolidation (accelerated by the 2008 crisis). The concentration of banking players has also led to easily observable changes, such as the reduction in the number of brick-and-mortar branches and ATMs, the natural corollary of the digitalisation of money.

The way to unification leveraged by regulation

Aware of this fragmentation, the European Institutions have worked legislator has continued to develop a framework aimed at a unified market (Single Euro Payments Area or SEPA), the legal foundations of which were first the Payment Services Directive of 2007 (PSD1) and its subsequent 2015 revision (PSD2). The implementation of PSD2 should be fully completed by the end of 2020, when the final provisions on SCA (Strong Customer Authentication) come into effect.

Among the multiple objectives of PSD2, the most anticipated development is certainly the way in which it will stimulate the emergence of new services in the context of open banking. In the minds of its designers, there is also the desire to nurture European champions capable, through the harmonisation of a market the size of a continent, of competing with the major American and Asian players described in the previous chapters. At the heart of the harmonisation mechanism is the "passporting" of licenses, which enables an entity regulated in one country to offer its services throughout the European Union.

Europe: a fragmented landscape

In order to fully understand the European regulatory framework, it is essential to briefly mention two other regulations:

- The Cross-Border Payments Regulation (CBPR) introduced a "price equality rule" which provided that fees and charges for cross-border payments denominated in euro should be no more than corresponding national euro payment of the same amount. The revised CBPR2 enhanced this rule by extending it to non-euro area Member States.

- The Multilateral Interchange Fees Regulation (MIF Regulation) caps multilateral interchange fees (MIFs) in card-based payments

The rise of Instant Payments

At the European level, the main bodies designing or influencing the industry, including the European Central Bank, are promoting the emergence of instant payment via the "SCT-inst" standard technical scheme and the European interbank network called "TIPS" (TARGET Instant Payment Settlement). In the opinion of all observers, open banking on the one hand and instant payment on the other is the recipe for all tomorrow's payment solutions.

Account-to-account: the Nordic influence is spreading

Independent research conducted by *Payments Cards and Mobile (PCM)*[11] suggests that account-to-account digital payments may be starting to replace card payments in some of Europe's – and the world's – most advanced payments markets such as Sweden, Norway and Iceland.

Data from PCM supporting this sea-change in European payments habits include a near 300% rise in the number of UK banks offering digital wallet services such as Apple Pay and Google Pay in 2019; a rise in transaction volumes on Sweden's account-to-account SWISH service by more than 30%, with transaction values hitting a record 200 billion SEK in 2019, and the flatlining of card numbers and POS infrastructure in the Nordic markets. Although many digital payments schemes, including wallets, were initially linked to card accounts, new players like Gocardless (UK) and Trustly (Sweden) link directly to bank accounts, further threatening the dominant position of the card networks.

Traditional Infrastructure in decline

Bank branch numbers have fallen by around 5.6%, or about 10,000 branches, across Europe in 2019. At the same time, the number of ATMs fell by 1.15% to 453,892. Both of these data points are clear indications of a long-term move away from cash-based services. However, the growth in overall card numbers across Europe is also slowing: across the continent, card numbers grew by just 2.71% per year over the last five years. Over the same period, the number of card payments grew by 10.98% each year on average, and the value of card expenditure rose by 5.93% each year over the period.

[11] See www.paymentyearbooks.com

Europe: a fragmented landscape

Cards are now well established as the norm in payments. However, their dominance appears to be peaking – and the rapid growth in digital wallet and instant P2P systems, especially in the Nordics, is beginning to make its presence felt. Across Europe's more developed markets, such as the UK, France, the Netherlands and the Nordic countries, around two-thirds of banking customers are now engaged in online banking either via the internet or mobile apps.

Digital rising

In countries like Iceland and Sweden, this number can rise as high as 85% of banking customers at certain banks being engaged digitally. If the first phase of the digital revolution was establishing online services, we can expect the next stage to include a move to app-based payment technologies like digital wallets, and instant P2P payments services like Sweden's SWISH and instant payments in the Netherlands. For the first time in 2020, research has revealed hard evidence that digital P2P and account-to-account systems are moving from the edges to the mainstream in Europe's most sophisticated markets, demonstrating the importance of dynamic technologies in a rapidly-changing market.

Data from across Europe has also revealed that debit cards have continued to increase their current dominance, with debit payments replacing cash at a faster rate than ever before. Across Europe, the number of credit cards declined this year by 3.5 million (-1.1%), while debit cards grew in number and usage. Continent-wide, debit cards were used in 72.2 billion transactions to pay for €2,572 billion in goods and services by Q1 2019.

There's no question that cards now dominate payments and are used for more than 52% of all transactions across Europe. However, the massive growth rates seen in instant account-to-account and mobile wallet payments lead us to believe that the next wave of development in digital finance is firmly underway, especially in the most developed markets.

South-Eastern Europe: the last frontier

Readers may well conclude from the above that Europe's card businesses are saturated, and that cards (and cash) are now beginning to give way to digital peer-to-peer and account-to-account systems. While this story is borne out in the highly developed markets of Western Europe (see following pages), there are still significant growth opportunities for card businesses providing both infrastructure, processing and issuing services in markets like Romania – where 97% of all transactions are still conducted using cash – and countries in the Balkan peninsula, including Croatia, Slovenia and Serbia.

E-commerce takes off, ID hacks rocket

Internet sales across the EU averaged around 10% of all retail sales by Q1 2019, due to increasing use of mobile devices for e-commerce. In late 2019, it was estimated that e-commerce in Western Europe was growing at around 10.2% on average, approximately half the global growth rate

Europe: a fragmented landscape

as European economies are more mature in digital commerce. The leading e-commerce countries ranked by B2C e-commerce value were the UK, Germany, France, Russia, Italy and Spain.

In 2018, 69% of internet users in the EU shopped online, ranging from 98% in Iceland and Norway to 72% in Bulgaria and in Turkey. Furthermore, 20% of European businesses were involved in e-commerce, up by 3%, and 79% of all EU businesses had websites. In 2018, while Asia Pacific (+16%) boomed, North America (+8%) was slowing down. The 'rest of world' composed of South America, the Middle East and Africa grew by 13%, a bit faster than Europe, which grew by 8% between 2017 and 2018.

Despite extensive investment and coordination between financial institutions and law enforcement, European card fraud losses in the 19 major countries hit a record 1.6 billion last year as criminals took advantage of a boom in card not present (CNP)-based online payments and mobile shopping. CNP fraud across major European markets grew to 70% of all card fraud losses, and ranged between 41% and 84%of losses in individual countries.

At £671m (€791.78m), the UK accounts for just under half of all card fraud in Europe, with the UK's status as an early mover to mobile wallet technologies responsible for at least part of this increase. CNP fraud in the UK declined as a percentage of overall fraud by 11.05%, but still grew by 24% as a stand-alone category. The increase in overall fraud was largely driven by a huge (59%) increase in ID fraud, caused by data breaches in new digital and mobile payments systems.[12] Overall, the UK reversed an 8% drop in fraud in 2017 to record a total increase of 19% in 2018. Across Europe as a whole, Hungary, Russia, Poland and Greece recorded the biggest increases in overall fraud, with Romania and the UK in fifth place.

B2C E-Commerce Revenues by Region

€BN	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Europe (E47)	403.2	459.7	530.6	578.3	624.6	8.00%	12.12%
Growth/year of B2C eCommerce sales in Europe	14.4%	14.0%	15.4%	9.0%	8.0%	-11.11%	-15.07%
North America	394.0	580.4	632.7	689.6	744.8	8.00%	17.43%
Asia Pacific	581.0	952.7	1,143.2	1,371.9	1,591.4	16.00%	31.41%
Rest of World	67.0	45.1	50.9	57.5	62.7	9.00%	-2.39%
Global B2C e-Commerce revenue	1,445.2	2,037.9	2,357.4	2,697.4	3,023.5	12.09%	21.06%
- thereof Europe (E47) in %	27.9%	22.6%	22.5%	21.4%	20.7%	-3.65%	-7.38%

Note: in this table, Europe includes 47 countries (E47). Figures excluding distance selling. figures for North America, Asia Pacific and rest of world are estimated.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

[12] For further information, please see: https://www.fico.com/europeanfraud/united-kingdom

Europe: a fragmented landscape

Germany: where cash is still king

Germany is one of the world's most sophisticated payments markets and yet, for historical and cultural reasons, many Germans still prefer to pay cash for their purchases. In 2018, cash accounted for 74.3% of all retail payments by number and 48.3% by value. This data explains the country's relatively large volume of cash withdrawals compared to some of Europe's other more developed economies.

Alongside high cash use, most electronic payments tend not to be through cards – just 23.53% of cashless payments are made using cards, compared with the EU-27 country average of 56.61%. Most non-cash electronic payments in Germany are credit transfers and direct debits, accounting for 28.48% and 46.86% of all electronic payments made in 2018, respectively. In 2018, there were 270.3 cashless payments per capita composed of 66.4 card payments, 0.1 cheque payments, 77.8 credit transfers, and 128.1 direct debits Within card payments, debit and delayed debit cards account for more than 97% of all transactions, with credit cards used in only 2.34% of all transactions. These discrepancies between Germany and other European markets are chiefly cultural, with a long-standing aversion to the acquisition of debt helping to explain the German market's aversion to the use of credit cards.

An innovation leader...

Whether it's digital-only, internet or mobile banking, Germany is one of Europe's leaders – though still some way behind the most advanced markets in the Nordics in these

Cashless Payment Transactions in Germany

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Payment cards	3,467.9	3,722.9	4,080.7	4,521.7	5,330.7	17.89%	7.78%
Cheques issued	29.9	21.4	17.5	12.8	10.5	-18.44%	-19.67%
Credit transfers	5,633.1	6,019.7	6,186.2	6,298.6	6,452.7	2.45%	0.75%
Direct debits	8,517.8	9,675.9	9,764.5	10,305.7	10,616.4	3.01%	1.87%
Total	**18,042.6**	**19,798.6**	**20,372.4**	**21,417.8**	**22,656.3**	**5.78%**	**2.95%**
Total card payments per capita	42.8	45.6	49.6	54.7	64.3	17.54%	7.19%
Total cheques issued per capita	0.4	0.3	0.2	0.2	0.1	-18.68%	-20.11%
Total credit transfers per capita	69.6	73.7	75.1	76.2	77.8	2.14%	0.19%
Total direct debits per capita	105.2	118.5	118.6	124.7	128.1	2.71%	1.31%
Total cashless payments per capita	**217.9**	**238.0**	**243.5**	**255.7**	**270.3**	**5.70%**	**2.16%**

Note: payment cards include e-money purchases. Direct debits include ELV direct debits. Totals include other payments.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

> **Germany is one of the world's most sophisticated payments markets and yet, for historical and cultural reasons, many Germans still prefer to pay cash for their purchases.**

areas. Germany's N26 "neobank", or digital-only bank, now has more than 1.5 million customers across the USA and 17 European countries, including Denmark, Sweden, Norway and, most recently, Poland. All retail banks in Germany offer online banking services and mobile banking apps to their clients. According to Eurostat, 59% of all German bank clients were e-banking users at Q1 2019 – a high figure, yet some distance behind the 80-plus percent levels seen in the Nordics. Mobile banking adoption is fast growing due to the implementation of Strong Customer Authentication (SCA) under the EU's PSD2 directive: in 2019, more than 25 million Germans used mobile banking apps.

In mid-2019, more than 2,089 banks from 20 European countries registered for the SCT-INST scheme. This represents 51% of all European banks. In 2019, more than 50% of all IBAN-based payments in Germany were processed intra-day, or even immediately, inside of the same bank group. Potential first use cases for SCT-INST in Germany may include P2P, mobile banking apps, online payments, and B2B. In 2017, Reisebank was the first bank to make instant payment transactions in Germany.

...and e-commerce giant

By Q1 2019, 93% of all Germans used the internet and 83% of all internet users had bought online in the last 12 months. 24% of German online buyers purchased from neighbouring EU countries and 20% from non-EU countries. Around 82.4% of German internet users were using their tablets or smartphones. Remote payments are initiated from various types of internet capable devices. In 2018, there were an estimated 54.1 million smartphone users in Germany, representing 81.3% of all mobile phone users. Tablet users accounted for 60.5% of the internet users. According to the Mobile Ecosystem Forum (MEF), in 2018, in-store mobile payment is used by an estimated 19% of German consumers.

According to the German Retailers Association, the value of German online B2C e-commerce amounted to €93.1 billion (+9.1%) by Q1 2019, showing a CAGR of 11.1% from 2013. Germany's per-capita B2C e-commerce came to an average of €1,123.0 per head, while it was €1,356.3 per online buyer, which is towards the higher end of the spectrum in Europe. In 2017, e-commerce (eGDP) recorded a 3.11% market share of total German GDP.

Highly developed infrastructures

Finally, Germany is distinguished by its extensive POS and ATM networks, the former chiefly through the domestic "girocard" system. In 2018, there were 4.28 billion POS payments (+15.4%) with a total value of €254.2 billion: on average, there were 424.6 transactions per POS terminal per month (+12.1%). The average transaction value (ATV) per POS payment amounted to €59.39. In 2018, there were 2.11 billion ATM withdrawals (-2.0%) with a total value of €388.7 billion. There were on average 2,992.2 transactions per ATM per month, and the ATV per withdrawal on cards amounted to €184.60. As mentioned previously, these figures are considerably higher than comparable European markets, owing to many Germans' preference for cash payments at point of sale.

Europe: a fragmented landscape

"The UK shows how important it is for successful markets to embrace and lead change."

The UK: still a global hub

The UK has withdrawn from the European Union following the 2016 referendum – yet the exact nature of its relationship with the EU remains in question, especially in the light of current challenges relating to COVID-19, which threaten to delay or derail negotiations between the UK and EU.

Nonetheless, some of the country's trading advantages in payments and financial services are clear: companies have access to more liquidity through London's capital markets than through the rest of Europe's centres put together; FinTech investment in UK firms grew by 38% in 2019 to reach $4.9 billion, making the UK Europe's leading FinTech hub and accounting for more than 50% of all FinTech investment across Europe. As a consumer and B2B market, the UK can also flex its muscles with pride, being the equal to the 18 smallest EU states combined in GDP terms.

The need to deal

If there's an Achilles heel to this global powerhouse, then it is the country's over-reliance, economically speaking, on financial services and the need for its firms to be able to continue to export these financial services. Post-Brexit, many such services will no longer be exportable to the EU. To combat this, many UK-based companies have already set up European entities and licenses by relocating to Ireland, Germany, France and Luxembourg. In particular, payment companies and electronic money institutions (EMIs), two of the UK's great strengths, are at serious risk in the event of a "no deal" conclusion to Brexit. The number of EMIs resident in the UK grew by 30% to reach 181 in Q1 2019. Many of these are active across Europe thanks to the current "passporting" regime, which will, regardless of any agreement on a future relationship between the EU and the UK, cease to be a possibility at the end of the transition period.

Home to the highest number of foreign banks in the world, the UK comprises the largest banking sector in Europe and the third largest in the world after the US and China. The UK banking sector consistently holds one fifth of Europe's banking assets. According to the Bank of England in late 2019, there were 161 commercial banks, 45 building societies resident in the UK, and a large number of credit unions. In addition, in 2018, there were 81 branches of EEA-based credit institutions and 57 branches of foreign banks entitled to accept deposits through a branch in the UK. Bank branches have plummeted at a faster rate than in any other European country: although there were more than 20,000 branches in 1988, there are currently around 7,000 remaining.

Europe: a fragmented landscape

On an edge

Although the UK is undoubtedly an innovator and technology leader, with more than 70% of debit and credit payments now contactless and more digital banks than any other European country, doubts about the shape of Britain's regulatory regime post-Brexit persist. Against these concerns, the UK continues to forge ahead in areas such as digital banking, where 74% of all Britons now use electronic banking services, faster payments (launched in 2017 and now worth more than £2 billion per annum), open banking, mobile wallets and digital account-to-account transactions. A mid-2018 study predicted that UK mobile banking would overtake internet banking in 2019, and that by 2023, mobile banking would overtake internet/desktop banking as the most popular means of digital banking. This places the UK on a par with the most advanced markets in the world when it comes to digital and mobile financial services, and shows how important it is for successful markets to embrace and lead change – more than any other European country, the UK has consistently led change, from open banking to contactless payments.

Pioneering the future in authentication: a practical illustration

UK companies continue to be pioneers in new payments methods, including companies such as FingoPay. This British company is pioneering the use of Vein ID for point-of-sale payments. This technology scans the unique veinal patterns inside an individuals' finger – which are many times more unique to an individual than their fingerprint – and uses this pattern as a means of confirming payment when the customer places their finger in a purpose-built FingoPay terminal.

Europe: a fragmented landscape

Cards dominate, digital proliferates

Between 2018 and 2019, the number of UK banks offering digital wallets such as Apple Pay to clients more than trebled. In 2020, e-marketer estimates[13] that 8.3 million people in the UK, or 19.1% of smartphone users, will have made at least one proximity mobile payment in the past six months. This proportion (less than one-fifth) will creep up throughout the forecast to reach 25.5% in 2023. However, the dominant cashless payment instrument by number remains card payments, which accounted for 70.85% of all cashless payments compared with 56.61% in the EU as at Q1 2019, followed by credit transfers (14.53%) and direct debits (13.55%). Within card payments credit cards accounted for 17.88%, with debit cards made up the vast majority of payments at 83.22% of all transactions.

In 2018, there were 483.8 cashless payments per capita, up 8.86% from 2017. They were composed of 342.8 card payments per capita, 70.3 credit transfers per capita, 65.5 direct debits per capita, and 5.20 cheque payments per capita. Immediate payments branded Faster Payments amounted to 43.7% of UK credit transfers. These figures are on a par with the most advanced markets in Europe, and underline the UK's role as a global leader in financial services generally, and payments in particular. The current emphasis on digital and contactless payments in the UK, together with its leadership in open banking, again serves to emphasise the flexibility and openness of its payments model.

Cashless Payment Transactions in the UK

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Payment cards	15,778.0	17,284.0	19,055.0	20,794.0	22,782.0	9.56%	9.77%
Cheques issued	644.0	558.0	477.0	405.0	346.0	-14.57%	-13.58%
Credit transfers	3,939.7	4,051.8	4,233.3	4,259.0	4,673.0	9.72%	3.84%
- thereof Faster Payments	1,100.9	1,247.0	1,426.1	1,655.8	2,042.8	23.37%	16.12%
Direct debits	3,672.0	3,908.4	4,071.9	4,227.0	4,355.8	3.05%	4.32%
Total	**24,033.7**	**25,802.2**	**27,837.2**	**29,685.0**	**32,156.8**	**8.33%**	**7.49%**
Total card payments per capita	244.3	265.5	290.3	314.9	342.8	8.86%	8.98%
Total cheques issued per capita	10.0	8.6	7.3	6.1	5.2	-15.12%	-14.21%
Total credit transfers per capita	61.0	62.2	64.5	64.5	70.3	9.02%	3.09%
Total direct debits per capita	56.8	60.0	62.0	64.0	65.5	2.39%	3.57%
Total cashless payments per capita	**372.1**	**396.3**	**424.0**	**449.5**	**483.8**	**7.63%**	**6.72%**

Note: in 2018, 43.7% of all UK credit transfers were immediate Faster Payments.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

[13] See https://www.emarketer.com/content/uk-mobile-payment-users-2019

Europe: a fragmented landscape

> The success of the 'Cartes Bancaires' system over the last twenty-five years shows how powerful effective partnerships can be.

France: home advantage

With a long and excellent record in cross-industry co-operation in financial services, plus one of Europe's best-known domestic card schemes in "Cartes Bancaires", France is seeing a rapid adoption of wallet payment technologies similar to that experienced in the UK, as well as widespread take-up of contactless card payments.

"Cartes Bancaires", or "CB" for short, was founded in 1967 by six major banks and has established France's ATM and POS network, a classic case of shared infrastructure. It is not to be confused with its more common mode of payment "Carte Bleue VISA". The "CB" network however supports other brands such as Mastercard.

Despite the sophistication of its payments market, France has yet to experience the same level of consolidation as comparable markets such as the UK and Germany when it comes to financial services. In 2019, the French banking industry numbered 339 banks with 36,519 branches in the country. There were 166 commercial banks, 70 branches of foreign banks (Euro Area: 45, EEA: 13; non-EEA 12) and 96 savings, cooperative and rural banks operating in France. In addition, the financial arm of the French postal service, La Banque Postale, provides a wide range of retail services. The ATM network is in slow (c.2% per annum) decline as the popularity of cash payments ebbs. While some domestic digital-only banks have prospered, such as Boursorama, there's also a strong presence for international neobanks like Revolut and N26.

A mature market for electronic payments

Card use in France is high, with 8.8-times more card payments than cash withdrawals. There were 169.5 payments via the "Cartes Bancaires" system by Q1 2019. "CB" is one of the largest card schemes in the European Union with 70.4 million cards, a network of 54,000 ATMs and 1.77 million CB acceptance contracts with merchants, and with a card use comprising 12.7 billion card transactions with a turnover of €589.8 billion in 2018. In 2018, contactless cards constituted 68.4% of the "CB" cards total, and there were more than two billion contactless transactions on "CB" cards. The success of the "CB" system, when considered over the last twenty-five years, shows how powerful effective partnerships and ventures can be.

French card use is slightly above the European average: by Q1 2019, payments on French cards by number had a market share of 56.82% compared to 56.61% across the EU. Debit cards are by far more popular than credit cards, and accounted for 94.55% of all transactions once delayed debit (17.9% of all transactions) are included. The second and third most popular cashless electronic payments by number were direct debits (17.92%) and credit transfers (17.18%). In 2018, there was a high level of 349.3

Europe: a fragmented landscape

cash less payments per capita, up 6.65% from 2017. These were composed of 198.5 card payments per capita, 26 cheque payments, 60 credit transfers per capita, and 62.6 direct debits per capita. Exceptionally for a modern, developed European economy, cheque use in France remains high. The popularity of debit payments at point of sale continues to grow, thanks in part to an ever-expanding POS terminal network, up 12.63% on an annual basis by Q1 2019.

A significant contributor to European online commerce

France is the third largest e-commerce market in Europe after the UK and Germany. In 2018, it generated 14.91% of European e-commerce turnover and has an avid online shopping population. From 2015, due to EU VAT regulation, French merchants will have to collect the applicable VAT rate for cross-border sales based on the consumers' residence.

In France, the growth of distance selling has gone hand-in-hand with the development of e-commerce. As at end-2018, 89% of the French population have used the internet and 75% of internet users have purchased online in the last 12 months. 40% of French online buyers purchased from neighbouring EU countries with 41% of them purchasing goods on German websites, although the principal international e-commerce purchasing destinations are the United States and China.

Cashless Payment Transactions in France

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Card payments	9,490.8	10,323.9	11,035.1	12,059.7	13,352.3	10.72%	8.17%
Cheques issued	2,482.8	2,311.5	2,137.5	1,926.7	1,746.9	-9.33%	2.76%
Credit transfers	3,417.0	3,621.1	3,752.9	3,869.7	4,037.4	4.33%	4.43%
Direct debits	3,541.5	3,879.1	3,962.6	4,091.3	4,211.1	2.93%	6.26%
Total	**18,958.0**	**20,208.0**	**20,907.9**	**21,964.3**	**23,498.0**	**6.98%**	**5.37%**
Total card payments per capita	143.1	155.1	165.1	179.8	198.5	10.37%	7.76%
Total cheques issued per capita	37.4	34.7	32.0	28.7	26.0	-9.62%	2.37%
Total credit transfers per capita	51.5	54.4	56.2	57.7	60.0	4.01%	4.03%
Total direct debits per capita	53.4	58.3	59.3	61.0	62.6	2.61%	5.86%
Total cashless payments per capita	285.9	303.5	312.9	327.5	349.3	6.65%	4.97%

Note: card payments include e-moneo transactions. Totals include transactions by other payment instruments which are usually bills of exchange.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

Europe: a fragmented landscape

> "If Spain's payment market has recently been characterised by consolidation and modernisation initiatives, then this has not reduced its capacity to look ahead at new opportunities."

Spain: all change

In recent years, Spain's payments market has been characterised by the consolidation and modernisation of both its payments infrastructure and its banking sector. Three domestic payment networks, each with its own card badge, have been merged into one infrastructure – SistemaPay. At the same time, and in common with other European countries, the overall number of bank branches and ATMs has been slowly declining as consumers switch to online banking and electronic payment in all its forms, from e-commerce through to cards at POS and digital wallets.

Consolidating for efficiency

In earlier years, Spain had one of the most extensive POS and ATM acceptance networks anywhere in Europe – though this often led to "doubling up" and low use of certain ATM and POS locations as consumers faced an extensive range of options. Since 2018, the merger of the three domestic card schemes (ServiRed, Sistema 4B and Euro 6000) into one entity has enabled a more simple ATM and POS infrastructure at less cost. Meanwhile, consolidation in the Spanish savings bank sector ("Caixa") has seen the number of such organisations drop from 45 to 2 banks, and consolidation continues in the commercial bank sector. The top four retail banks in Spain grew as a result, improving their share of total bank sector assets by 10% in the last decade to reach 62.21% of all bank assets by Q1 2019.

Despite this consolidation, there is still an expansive ATM network, with 53,379 ATMs for 46.73 million people, and 1.642 million POS devices in the country. Card payments continue to grow strongly, and became the dominant non-cash means of payment for the first time in 2018, beating out credit transfers. Within card payments, debit cards accounted for 67.94%, with credit card payments accounting for the balance. By Q1 2019, Spanish use of non-cash payments exceeded the European average for the first time.

Digital banking and online commerce

A number of digital-only challenger banks have entered the Spanish banking market, e.g. N26, Revolut and TransferWise. They already have a clear Open Banking strategy in place. In parallel, many Spanish banks co-operate and partner with trusted digital payment providers and FinTechs to prepare for the Open Banking ecosystem, enrich their digital banking services, and to offer additional mobile banking app features. In March 2018, BBVA launched Denizen, a global, borderless account for expat banking that allows customers to receive money in one country and pay it out in another immediately, avoiding international transfer fees and eliminating currency exchange fees. Although Denizen was closed at the end of 2019 – demonstrating that not all innovations are

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successful – both BBVA and other leading Spanish banks have successfully launched digital wallets and e-banking services to their customer base to combat the arrival of Apple Pay and other wallet schemes from global technology players. In terms of the proportion of retail banking players offering digital wallets to consumers, Spain is second only to the UK across Europe, with 40 Spanish banks offering this service by Q1 2019.

According to Eurostat, 49% of all Spanish bank clients were online banking users in 2018, somewhat below the European average of 52%, and 48% of mobile phone users engage in mobile banking. In 2018, 86% of Spaniards used the internet and 61% of internet users purchased in online shops in the last 12 months. Around 92% of Spanish cross-border e-commerce was with other EU countries in 2018, primarily Germany and the UK. In 2019, SistemaPay recorded the majority of e-commerce operations in Europe as coming from Luxembourg (37.1% -the home of Amazon Europe), and the UK (26.5%).

In 2018, more than 74% of Spanish mobile phone users accessed the internet via mobile devices and 49.3% made online purchases using tablets or smartphones.

Looking ahead

If Spain's payment market has recently been characterised by consolidation and modernisation initiatives, then this has not reduced its capacity to look ahead at new opportunities. In June 2019, Spain's Momo was one of six European mobile wallets including Austria's Bluecode, Finland's ePassi and Pivo, Oslo-based Vipps, and Portugal's Pagaqui to announce that they would modify their systems to enable acceptance of AliPay transactions. BBVA also integrated AliPay's QR-based payment service into its wallet. Given its status as a world-class destination for tourism, such initiatives show Spanish payments players preparing for a future in which Asian economies will play a much greater role.

Europe: a fragmented landscape

"The Italian market has been distinguished by technological advances, such as Bancomat Pay and Jiffy."

Italy: Consolidation and technology

Historically, small local and regional banking groups, many of them mutually owned, have characterised the Italian banking sector. As a result, aside from Germany, market concentration in Italy was much lower than in other large western European markets. According to the ECB, the share of the five largest credit institutions in total assets was only 26.7% in Italy in 2005, the second lowest in the EU after Germany.

Since that time, the Italian market has been distinguished by technological advances, such as Bancomat Pay and Jiffy, on the one hand (see below); and continued consolidation of the financial services sector on the other. The number of financial institutions headquartered and operating in Italy declined from 1,156 in 1990 to 604 by Q1 2017; by Q1 2019, there were around 500 remaining – a decrease of almost 20% in two years.

One distinguishing oddity of the Italian market is its status as a European leader in the use of prepaid cards, with Poste Italiane developing a popular, multi-function Postepay Lunch Card. As well as acting as a payment card, this product also functions as an electronic luncheon voucher. Paysafe and other international players are also active in the Italian prepaid market.

Internet and mobile innovation

International digital-only banks have established presences in Italy; at the same time, Italian banks have launched their own digital-only brands, and invested in FinTechs to speed up the transition to digital banking. In April 2018, Banca Sella agreed a £24 million cash deal to buy mobile financial services outfit Vipera (UK). Founded in 2005, Vipera has offices in London, Milan and Zurich, selling mobile banking, card management and customer engagement technology to financial institutions, including Mashreq Bank in the Middle East.

Despite these moves, a relatively low 34% of Italians use e-banking services, though this number is up 3% in the last two years. Likewise, there are a relatively low (7) number of Italian e-money institutions, though these are supplemented by passported operations from foreign countries, primarily the UK – again underlining the importance of the European market to the UK's giant financial services industry.

Digital payments in a Jiffy

In October 2014, the Italian banks and Italian processor SIA launched the first European "Person to Person" (P2P) payments service, "Jiffy", which, via an app, allows users to send and receive money in real time on their smartphone to and from their contacts. Jiffy is based on the

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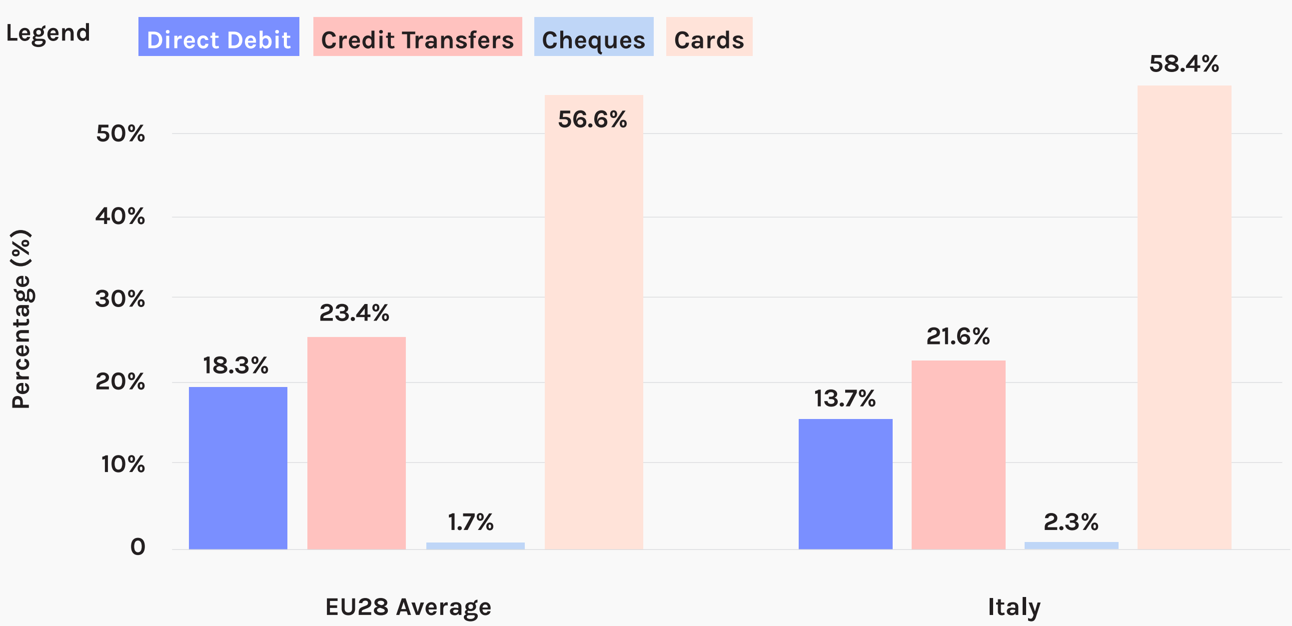
SEPA Credit Transfer service. In June 2018, there were 5 million registered Jiffy users, and the ATV per Jiffy payment is around €50.
From March 2018, Italian consumers can pay for their shopping directly from their accounts by using the Jiffy app combined with a QR-code scan. In mid-2018, Bancomat signed an agreement with Jiffy to make its POS terminals available to Jiffy app holders. This move dramatically increased Jiffy's usage profile, given that Bancomat has more than 2.1 million POS terminals (2018) in Italy.

Italian banks have also signed deals with AliPay and WeChat Pay to support payments via the Chinese digital giants at POS in Italy. As with Spain, Italy's status as a major global tourist destination has helped to heighten interest in these deals. Apple Pay, Google Pay and Samsung Pay are all increasingly being offered by Italian banks.

Card comfort

Despite Italy's technological sophistication and the ongoing consolidation of its banking sector, card payments continue to grow rapidly in popularity and are the dominant (58.45%) payment instrument by number compared to 56.61% across the EU. Card payments showed a growing compound annual growth rate (CAGR) of 20.4% in the last five years. Credit card payments accounted for 33.12% of all card transactions in Italy by Q1 2019. Credit transfers accounted for 21.64% of all Italian cashless payments in 2018, while direct debits accounted for 13.73%. They are the dominant payment instrument in terms of value followed by direct debits and cheques.

Overview of Cashless Payments (2018) - Italy



Source: Payment Card Yearbooks

Benelux: faster, better, local

"Belgium's experience in encouraging consumers to adopt mobile payments shows how market leaders can shape and influence behaviour."

Belgium and the Netherlands are great examples of how much can be done inside a dynamic national payments infrastructure. While remaining fully connected to European and global networks, these two smaller but important economies have shown how important national payments infrastructures remain.

Belgium: merging for success

Following the financial crisis of 2007-08, the bank sector was rescued and reshaped by the Belgian state. Belgium's open regulatory environment, and the presence of a large number of international businesses, has attracted a number of large international cash management banks to the country. Coupled with a rationalisation of the tax regime relating to banks and credit institutions, the country has rebounded. Unsurprisingly, then, the Belgian banking sector has a much more international character compared to neighbouring countries: 83.9% of all banks in Belgium are foreign banks or in foreign ownership though subject to Belgian law.

Dynamic, modern payments

At the end of 2018, 69% of Belgians were online-banking users, and 61.4% of Belgians were mobile banking users. According to Belgium's financial statistics authority, by Q1 2019 there were 13 million online banking subscriptions and 7 million mobile banking subscriptions. Mobile banking apps offering immediate mobile money transfer services in Belgium include "Bancontact by Payconiq", and PayPal.

In 2018, card payments accounted for 50.34% of all cashless payments in Belgium, compared to 56.61% across the EU. They showed a 12.7% growth rate in the last five years. Credit transfer (37.68%) is the other significant cashless payment

Cashless Payment Transactions in Belgium

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Payment cards	1,539.8	1,482.8	1,704.7	1,953.2	2,143.5	9.74%	9.50%
Cheques issued	2.9	9.5	1.9	1.4	1.1	-23.01%	-23.75%
Credit transfers	1,366.4	1,287.1	1,306.0	1,465.3	1,604.1	9.47%	9.42%
Direct debits	529.5	413.4	445.7	464.1	500.1	7.75%	9.82%
Total	3,442.4	3,193.7	3,459.8	3,901.0	4,257.7	9.15%	9.52%
Total card payments per capita	137.7	131.9	150.9	172.1	187.9	9.20%	8.96%
Total cheques issued per capita	0.3	0.8	0.2	0.1	0.1	-23.39%	-24.12%
Total credit transfers per capita	122.2	114.5	115.6	129.1	140.7	8.93%	8.88%
Total direct debits per capita	47.4	36.8	39.5	40.9	43.8	7.22%	9.27%
Total cashless payments per capita	307.6	284.1	306.2	342.2	372.5	8.85%	8.93%

Note: payment card figures include e-money transactions, totals include other payment services. Most figures have been restated.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

instrument in Belgium, in terms of both volume and value. Direct debits (11.75%) are used for recurring payments and utility payments. Cheque use (0.03%) is marginal. Cheques are used for one-off, high-value payments such as property purchases.

In 2018, there was a high level of 372.5 cashless payments per capita, up 8.85% from 2017. They were composed of 187.9 card payments per capita, 140.7 credit transfers per capita, and 43.8 direct debits per capita.

Bancontact Payconiq

In 2006, the Bancontact-Mister Cash Company (BC/MC) – the association responsible for the BC/MC scheme brand & license – was established during the MC sale of Banksys which had managed the payment schemes BC/MC (now: Bancontact) and Proton up to that point. In March 2018, Bancontact announced its merger with the Dutch/Belgian mobile payment app, Payconiq. The new Bancontact Payconiq Company was established on the initiative of five Belgian banks: AXA Bank, Belfius, BNP Paribas Fortis, ING and KBC.

The key product of Bancontact Payconiq Company is a single mobile payment app, which combines the Payconiq app with the scope of the Bancontact app. In 2019, more than 60,000 merchants across Belgium, Luxembourg, and the Netherlands were connected to Payconiq's plug-and-play platform. Belgium's experience in encouraging consumers to adopt mobile payments via digital wallet demonstrates how market leaders can shape and influence consumer payments to adopt new technologies: changing consumer habits can be a particular challenge in the payments arena.

Throughout 2019, Bancontact Payconiq expanded its range of partnerships to include charitable giving with Scan for Change, home food delivery, and a wide range of other providers. In September 2019, Bancontact Payconiq partnered with Viva Wallet to enable mobile payments in a further 100,000 merchants across 17 European countries. In 2018, there were 16.0 million Bancontact cards with 1.48 billion transactions. Bancontact acceptance points included 181,065 POS terminals, 54,226 online shops and 17,327 ATMs, car parks and railways.

Tackling the digital ID challenge

Belgium is a significant e-commerce player. By Q1 2019, 87% of Belgians used the internet, and 68% of all internet users purchased in online shops in the last 12 months. 64% of Belgians purchased from neighbouring EU countries, mostly from the Netherlands, France and Germany, but also from the USA and the UK. Online buyers purchase using PCs, notebooks, tablets or smartphones. Thus, remote payments are initiated from various types of internet capable devices. 77% of Belgians also accessed the internet via mobile devices and 29% made online purchases using tablets or smartphones.

To help enable further growth in online commerce, in May 2017, four Belgian banks and three mobile network operators unveiled a mobile ID platform, "itsme", that will let consumers use a single digital identity to access a range of services such as requesting government documents and confirming online transactions using the SIM card on their mobile phone and a unique five-digit code. In June 2018, Signicat, the digital identity provider, partnered with Belgium Mobile ID to integrate the Belgian itsme digital identity scheme into the Signicat Digital Identity Platform. This move puts Belgium among Europe's leading nations in enabling a national digital ID scheme. In the future, digital ID is going to be among the key challenges faced by the payments industry, alongside know your customer (KYC) initiatives designed to reduce or prevent payments fraud.

Benelux: faster, better, local

> " The capacity to engage with other countries and regions will be vital to success in the future. "

The Netherlands: Rapid innovation

The Netherlands has a universal banking system, with no distinction made between commercial and investment banking activities. There is little significant involvement by foreign banks in the Dutch banking market. In February 2019, the Dutch National Bank (DNB) said it is processing applications for PSD2 licences from 20 UK companies concerned about a no deal Brexit in order that they may continue to offer their payment initiation services and account information services across the EU.

A tech-savvy market

A number of international digital-only challenger banks have entered the Dutch banking market, such as N26, Revolut and TransferWise. In parallel, many Dutch banks co-operate and partner with trusted digital payment providers and FinTechs to prepare for the Open Banking ecosystem, enrich their digital banking services, and offer additional mobile banking app features. According to Eurostat, 89% of the Dutch population used e-banking services by Q1 2019, and 66% of mobile phone users accessed mobile banking services, including 60% of 50-64 year-olds. Mobile banking is steadily on the rise, with around 1.5 billion transactions per year in 2017. 20% of all fund transfers were made using a smartphone or tablet.

In other areas of new payments technologies, from contactless transactions to wearable payments (such as smart watches or fitness straps), the Dutch are European leaders. For instance, in Q3 2019 Mastercard reported that 33% of all wearable transactions in Europe came from the Netherlands, placing the Dutch far ahead of other nations – including the UK (18%), Switzerland (8%) and Russia (7%) – in the development of this technology.

First to faster

With the UK now leaving the EU, the Netherlands has perhaps Europe's most developed profile for faster payments and instant money transfers in the bloc – though other countries, especially in the Nordics, are catching up fast. Mobile banking apps offering immediate mobile money transfer services in the Netherlands include Payconiq, Tikkie and PayPal. In 2018, the Dutch Payments Association recorded a total of 517 million transactions worth 145 billion Euro, almost double the number of transactions seen in 2017.

Outside peer-to-peer transfers, the Dutch SEPA Instant payments program went live in April 2019, supported by all Dutch banks. Instant payments reached a first peak in August 2019, when 1.3 million instant payments were processed by the Dutch banks. Instant payments are projected to grow at more than 32% per year in the Netherlands

Benelux: faster, better, local

between now and 2025. Confirming the rapid growth in Dutch instant payments, In November 2018, Paysafe (UK) announced the expansion of its payment by online bank transfer solution, Rapid Transfer, for Skrill and Neteller customers in the Netherlands and Belgium. When it comes to instant payments, the Dutch have excelled both in the introduction of a domestic scheme, and in ensuring interoperability with pan-European and international payments schemes. In many areas of payments, the capacity to engage with other countries and regions will be vital to success.

Cards taking over

In 2018, card payments by number accounted for 54.35% of all cashless payments compared to 56.61% across the EU. Card transactions showed a 9.5% growth rate between 2014 and 2018 from an already high level. Most non-cash electronic payments are credit transfers and direct debits, accounting for 29.49% and 16.15%, respectively. Credit transfers are the dominant payment instrument in the country in terms of value. Most recently, a high level of 505.3 cashless payments per capita was recorded by Q1 2019, up 10.97% from the end of 2017. These payments were composed of 274.6 card payments per capita, 149.0 credit transfers per capita, and 81.6 direct debits per capita.

Online innovation

By January 2019, 98.2% of the Dutch were active internet users, the second highest

Cashless Payment Transactions in The Netherlands

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Card payments	3,246.6	3,535.6	3,902.3	4,285.6	4,732.5	10.43%	9.48%
Cheques issued	0.2	0.2	0.2	0.1	0.1	-20.21%	-16.43%
Credit transfers	2,043.2	1,970.2	2,109.7	2,303.2	2,567.9	11.49%	4.98%
Direct debits	1,163.4	1,289.0	1,161.6	1,211.0	1,406.2	16.12%	1.12%
Total	**6,453.5**	**6,795.9**	**7,174.1**	**7,800.2**	**8,707.0**	**11.63%**	**6.51%**
Total card payments per capita	192.5	208.7	229.1	250.2	274.6	9.78%	8.94%
Total cheques issued per capita	0.0	0.0	0.0	0.0	0.0	-20.68%	-16.85%
Total credit transfers per capita	121.2	116.3	123.9	134.4	149.0	10.84%	4.46%
Total direct debits per capita	69.0	76.1	68.2	70.7	81.6	15.44%	0.62%
Total cashless payments per capita	**382.7**	**401.1**	**421.2**	**455.3**	**505.3**	**10.97%**	**5.98%**

Note: card payments include e-money transactions. Totals include a small amount of "other" payments.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

Benelux: faster, better, local

figure in the world, and 84% of them bought online in the last 12 months with half of them making more than five purchases each year – one of the highest e-commerce penetration rates in the world. 42% of Dutch online buyers purchased cross-borders. Of the total cross-border spending value, Dutch online buyers bought mostly from China (45%), Germany (26%), the UK (21%) and the USA (6%) as well as other neighbouring countries.

To service this buoyant e-commerce market, the three largest Dutch retail banks have developed iDEAL, the domestic online credit transfer service. Under iDEAL, consumers can make purchases on the internet and issue payment orders directly from their bank accounts in the same way as they manage their internet banking accounts. iDEAL payments to the merchant are guaranteed and fees are less than those on credit cards. Growth in the platform has been rapid.

iDEAL use has grown consistently quarter-on-quarter. On an annual basis the number of transactions grew in 2018 to 523.8 million, up 38.5% on 2017, with the value of purchases growing 29.55% from €33.1 billion to €42.9 billion. The ATV per iDEAL payment amounted to €81.95, and there were on average 30.4 iDEAL payments per capita, higher than the number of credit card payments per capita and an increase of 37.7% in a single year. The number of active online shops accepting iDEAL payments rose from 12,000 in 2008 to more than 130,000 in early 2019 – growth of 30% in the last year. Of the 'top 1000' Dutch online shops, more than 99% offered iDEAL and around 84% of all Dutch online shops in 2018. Additionally, iDEAL is accepted cross-border by around 90,000 online shops in 60 countries. In 2017, Google and Amazon started accepting iDEAL.

"Luxembourg has a strong role as an international payments hub."

Luxembourg: the local scene

Luxembourg has a strong role as an international payments hub, which will be explored alongside other such locations later in this piece. Luxembourg's own domestic market is relatively small, and despite the strength of its financial services sector and this forward-looking approach, it seems as if individual citizens in Luxembourg are somewhat more conservative in their banking habits.

The dichotomy facing Luxembourg's payments industry is starkly illustrated by the volume of e-payments through its e-money institutions. If cross-border e-money payments via institutions based in Luxembourg were included in the domestic total, the country would be the leading digital payments player in Europe, with e-money accounting for 91.8% of all cashless payments. As things stand, however, there is a contrast between the relative conservatism of Luxembourg's domestic scene, and the more progressive approach of its international banking industry.

Excluding e-money purchases, card payments are the most widely used cashless payment instrument in Luxembourg by number (63.95%) showing a compound annual growth rate of 13.97% between 2013 and 2018. Credit transfers are the dominant cashless payment service by value in Luxembourg. They accounted for 28.84% of cashless payments by number. Direct debits are less popular and accounted for 7.11% of cashless payments in 2018.

The use of cheques has declined for several years, representing only 0.1% of the cashless payments by volume. All cheques are physically exchanged and cleared bilaterally between banks. In 2018, there were 441.5 cashless payments per capita composed of 282.3 card payments, 0.4 cheque payments, 127.3 credit transfers, and 31.4 direct debits.

Cashless Payment Transactions in Luxembourg

(Millions)	2014	2015	2016	2017	2018	GR 17/18	CAGR 5Y
Payment cards	101.65	110.80	124.03	143.42	171.88	19.85%	13.97%
Cheques issued	0.28	0.26	0.26	0.25	0.26	3.15%	-2.21%
Credit transfers	57.76	59.12	61.41	66.87	77.52	15.93%	2.45%
Direct debits	14.91	17.31	18.49	18.18	19.12	5.17%	4.44%
Total excluding e-money	174.59	187.49	204.18	228.72	268.79	17.52%	9.12%
E-money purchases	1,535.92	1,849.00	2,184.25	2,583.13	2,993.83	15.90%	19.25%
Total cashless payments	**1,710.51**	**2,036.48**	**2,388.43**	**2,811.86**	**3,262.64**	**16.03%**	**18.18%**
Total card payments per capita	182.1	194.6	212.3	240.2	282.3	17.52%	11.49%
Total cheques issued per capita	0.5	0.5	0.4	0.4	0.4	1.15%	-4.34%
Total credit transfers per capita	103.4	103.8	105.1	112.0	127.3	13.68%	0.22%
Total direct debits per capita	26.7	30.4	31.6	30.5	31.4	3.13%	2.16%
Total per capita excluding e-money	312.7	329.3	349.5	383.1	441.5	-	-
E-money purchases per capita	2,750.9	3,247.3	3,739.3	4,327.0	4,917.5	13.65%	16.65%
Total cashless payments per capita	**3,063.6**	**3,576.5**	**4,088.9**	**4,710.1**	**5,359.0**	**13.78%**	**15.61%**

Source: Payments, Cards and Mobile www.paymentyearbooks.com

The Nordic Countries: Global Leaders

"Providing all parties with outstanding transaction security will prove crucial as our economies move online."

Iceland and the Nordic markets – Sweden, Finland, Norway and Denmark – are among the most advanced and sophisticated payments markets in the world. Sweden is leading the world towards a cashless society, with just 3% of its transactions now conducted using cash. These levels of sophistication have generated their own challenges, however, with the Swedish Parliament considering legislation to assure access to cash for the elderly and other groups at risk of being excluded by new digital technologies.

In addition to the strength and sophistication of their own digital payments ecosystems, these markets – Norway and Sweden in particular – exercise considerable influence over adjacent economies, most notably in the Baltic states. Taken together, the Nordic countries are acting as pathfinders for the rest of Europe, a fact reflected in the fact that Sweden has created more FinTech "unicorns" (companies valued at more than $1 billion) per head of population than any other nation on Earth.

Iceland – e-payments rule

Card use in Iceland is the highest in the world, reflecting the extension of card payments into new areas. In 2018, there were 77.7 million domestic payments on debit cards, equivalent to 217.7 per capita. Including credit cards, non-cash payments were 439.2 per capita, the highest domestic card use in Europe. The value of debit card payments at retail outlets was €2.86 billion in 2018, equivalent to €8,006.6 per capita, while the value of credit card payments at retail outlets was €2.935 billion, equivalent to €8,223.0 per capita. Iceland also joined the drive towards instant payments when Sedlabanki launched its instant payment platform in 2018.

Sweden – a digital standard-bearer

With 341.4 non-cash payments per capita, card use in Sweden is above the EU average, and it is the fourth highest card use level in Europe. Across the board, Sweden excels in technology adoption: 84% of all Swedish bank clients were e-banking users as at-end 2018. In biometrics, the identity and security provider Nexus and Norway's Zwipe, a biometric technology company, teamed up to roll out biometric access cards. Fingerprints AB, a Swedish company providing biometric factor technologies, is also one of the world's leading providers of two-factor authentication solutions for the payments industry.

Perhaps the most notable success for Sweden's payments industry is the Swish instant transfer system for individuals and companies. In December 2012, the banking sector launched Swish to enable private individuals to send money in real time by connecting mobile phone numbers to bank accounts. Individuals need a smartphone, a secure Swedish mobile Bank ID and the mobile Swish app. If the receiver has a phone with the Swish app, a notification is displayed within a few seconds.

The maximum amount varies by bank, but is often 10,000 SEK, or around 11,000 Euro.

The Nordic Countries: Global Leaders

In January 2016, Swish for Commerce was launched. There are now three solutions for immediate payments: Swish Private (P2P payments), Swish Business (C2B payments from a person to a company, association or organisation), and Swish for Commerce (for e-commerce and m-commerce transactions). In 2018, the Swedish Riksbank reported 395 million Swish transactions, up by 42.6% on 2017. In 2018, total Swish transactions amounted to more than SEK 200 billion, and there were on average more than 38.8 Swish payments per capita. In June 2019, Swish started running a pilot trial of Bluetooth checkout technology at two restaurants owned by one of the country's leading corporates, Cantina. By late 2019, Swish reported that 7 million Swedes are using Swish, and that Swish is the preferred method for online payments by Swedes aged 18-40. The Riksbank also reported that in 2018, 62% of Swedes had used Swish in the past month, up from 52% in 2016 and 10% in 2014.

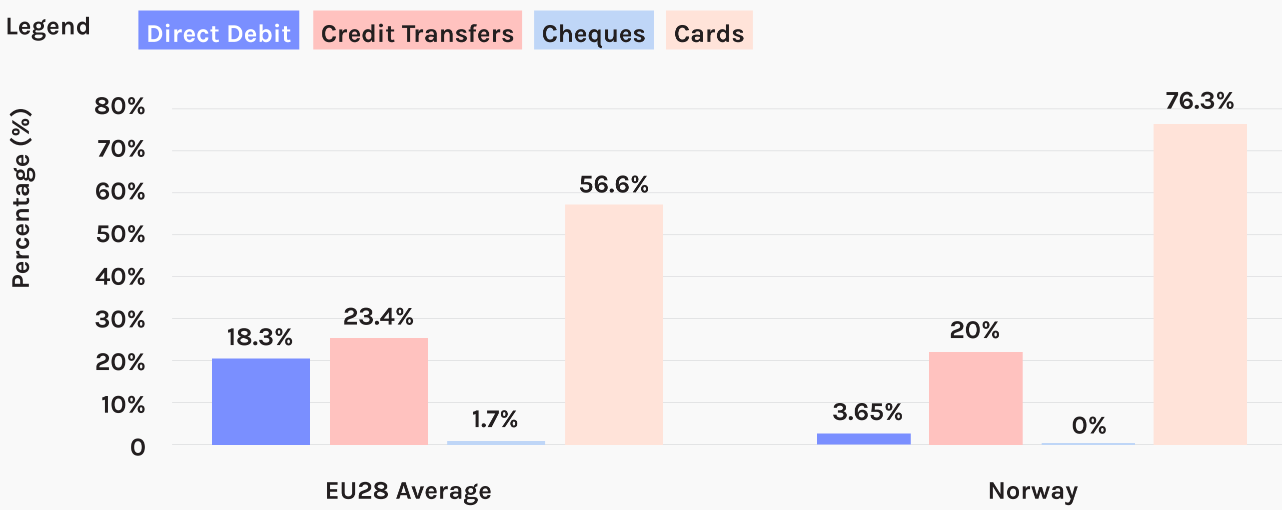
Norway – digital ID innovation

Like neighbouring Sweden, Norway is a global leader in electronic payments, with an average 2.74 cards per capita, one of the highest figures anywhere. And as in Sweden, the dominance of electronic payments is affecting the availability of cash: a mid-2019 report by Deloitte Nordics estimated the amount of cash in the total M1 money supply in Norway to be around 2.5%, implying that cashless transactions make up the other 97.5%.

The dominant payment instrument in Norway in terms of volume is card payments, which accounted for 76.33% of all cashless payments compared to 56.61% across the EU. However, credit transfer is the dominant payment instrument in terms of value. In 2018, credit transfers and direct debits accounted for 20.02% and 3.65%, respectively.

Norway boasts one of the world's most widely-used digital ID systems, bankID. Issued by the Norwegian banks, BankID is based on a coordinated infrastructure developed under the direction of Finansnæringens Fellesorganisasjon (FNO). The first BankIDs were issued in 2004: by 2019, more than 4

Overview of Cashless Payments (2018) - Norway



Source: Payment Card Yearbooks

The Nordic Countries: Global Leaders

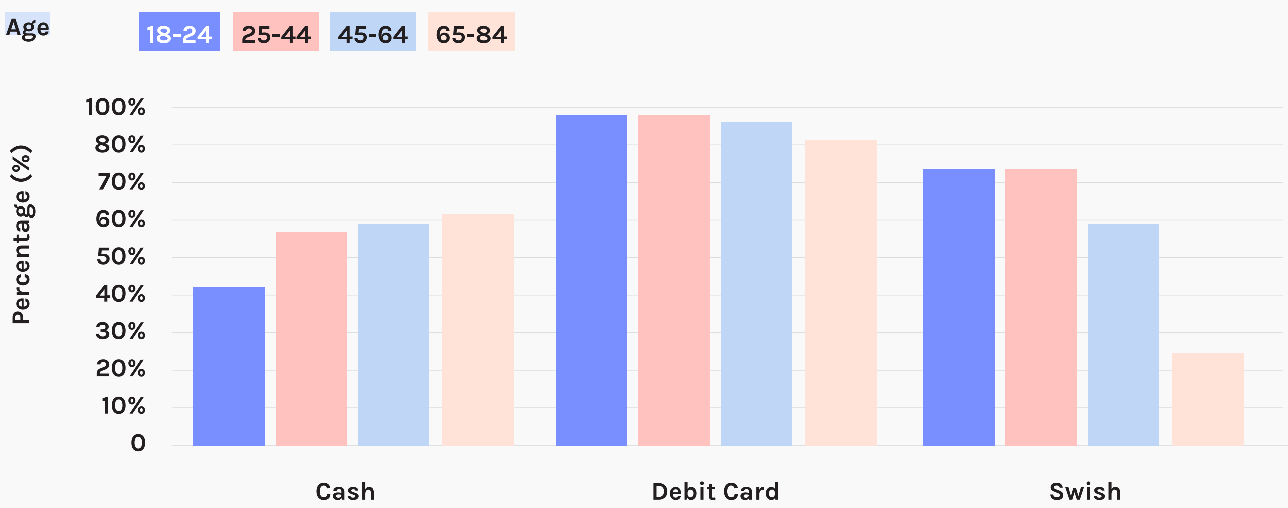
million Norwegians had BankID, and more than 1.6 million have 'BankID on mobile.' BankID is used by all the country's banks, public digital services and an increasing number of enterprises in different sectors, and a total of 800,000 to 900,000 BankIDs are used every day. BankID is used by more than 80% of all adults in Norway. With BankID, enterprises can identify Norwegians digitally online – the system has proven to be a huge benefit in enabling e-commerce and digital services from the government, providing a model for other markets to follow. Being able to provide all parties to digital transactions with outstanding transaction security through schemes such as BankID will prove crucial as our economies move further into the online environment.

Denmark: from card to app

Danish use of payment cards, already among the highest in Europe, hit 364.1 card payments per capita (267.5 on Dankort cards) in 2018, the second highest in Europe behind Norway. Cards account for 76.53% of all cashless payments by number compared to 56.61% across the EU. However, credit transfer (23.47%) is the dominant means of payment in terms of value.

The dominant domestic payment scheme is Dankort – though this scheme is itself beginning to move from card payments to a mobile app option for payments via digital wallet. By far the most popular payment app in Denmark is MobilePay, originally launched by Danske Bank and now used by 4.1 million people in a total population of 5.8 million. In spring 2017, NETS launched the Mobile Dankort app. In April 2017, 64 banks added Mobile Dankort to their mobile HCE NFC payments wallet, BOKIS. From 2017, NETS Group proceeded to upgrade POS terminals with a Bluetooth Low Energy (BLE) function, and implemented BLE-capable MPOS terminals from Spire Payments. Danes are now able to make in-store mobile payments using their Dankort card by tapping their phone against BLE capable POS/MPOS terminals.

Payment Methods in Sweden 2017-2019



Source: Swedish Riksbank

Eastern Europe and the Baltics: opportunities arise

"The countries enlarging the EU from 2004 onwards have now firmly established themselves as key participants in the European payments ecosystem."

The countries enlarging the EU from 2004 onwards have now firmly established themselves as key participants in the European payments ecosystem. Combining the EU's standards of governance with the kind of growth last seen in the Western European card business twenty years ago, Eastern Europe's markets represent considerable opportunities on the doorstep for the European payments sector. And there's evidence of real domestic innovation in schemes such as Poland's BLIK, which announced its plans to go international in early 2020.

That said, as we make clear below, growth opportunities are not without risks – the governments of some Central and Eastern European states have been hard at work to root out corruption inside some financial institutions and provide the stability and security vital to long-term growth.

South-East Europe

Markets such as Croatia and Slovenia are, in payments terms, approaching the sophistication of Western European markets – if not yet the same level of usage. Croatia, for instance, has achieved an impressive 2.41 payments cards per capita, easily the equal of most Western European states. Payment card use overall was up by 12.32% in Q1 2019 compared to a year earlier, with the number of card payments per head of population the second-highest among all South-Eastern European states, at 81.55. While still some way below the European average, card use per head grew at 13.4% in 2018, a good two to three times faster than in Western Europe. In Slovenia, card payments per head are the highest in South-Eastern Europe, at 97.9 payments per head of population. The physical payments infrastructure is also developing rapidly, with the Slovenian POS estate increasing by 11.1% to reach 35, 279 terminals by Q1 2019.

Central Europe: Exporting innovation

Thanks in part to their physical location next to Germany, the powerhouse of Europe's economy, as well as their developed banking infrastructure, central European markets like Poland, the Czech Republic, Slovakia and Hungary are well-established in payments terms and developing new and alternative structures in their payments ecosystems, including QR-based payments and payments with mobile wallets like Apple Pay, Google Pay

Eastern Europe and the Baltics: opportunities arise

and garminPay. In countries where the POS and ATM infrastructures are less developed such as Romania and Bulgaria, there is the opportunity that digital wallet and peer-to-peer payments could "leapfrog" traditional card payments in the longer term.

Poland's BLIK system has enabled transactions between bank accounts via a mobile front-end. Twelve participating banks and financial institutions have integrated BLIK into their mobile banking apps, which cover more than 90% of Polish bank customers. The strength of the proposition and support for this payment method locally means that BLIK transactions have almost trebled year-on-year. On 1 November 2019, BLIK announced that it would be enabling international transactions for its users, with global specialist payments processor PPRO acting as the international partner. This opens up acceptance for this popular local payment method across PPRO's international acquirer and payment service provider network. BLIK offers real-time money on a mobile — a strong proposition in Poland, where the percentage of banked adults (94%) is much higher than the percentage of credit cardholders (45%). In Poland, bank transfer payment methods are particularly popular, accounting for 51% of payments online, compared to card payments at 20%.

Latvia & Estonia: poised for growth

Our report on the Nordics (see page 50) explains the influence of Nordic banks on payments in the Baltic states, an influence that reflects both historic and cultural ties, and the significant ownership of Baltic banks by Norwegian and Swedish banking groups. The Baltic states have shown themselves to be open to new technologies.

Latvia

In 2017, Latvijas Banka launched a system enabling the country's banks to provide an instant payment service, Zibmaksajums, to their customers. In June 2019, Latvia's parliament passed new regulation to bolster the fight against money laundering and terrorism financing. The country's government had been accused of being too lenient with banks in the past. The new anti-money laundering (AML) and combatting the financing of terrorism (CFT) regulations outline the duties of the country's banking watchdog, the Financial and Capital Market Commission, so it can fight money laundering and terrorism financing in the financial sector.

The Latvian card market has a competitive, decentralised, infrastructure composed of 14 card issuers, ten acquirers, card processors, seven ATM networks and five POS networks. The number of Latvian payment cards reached 2.24 million by Q1 2019, down 65,000 from a year earlier. In 2018, the total bank cards in issue were equivalent to 1.17 cards per capita; 88.04% of these bank cards were debit cards. As in other Baltic states, the domestic banking market is dominated by banks from Sweden.

Eastern Europe and the Baltics: opportunities arise

Estonia

Following a deep economic recession in 2008-2009, the Estonian payments market has been characterised by consolidation on the one hand, and a reach for new innovations on the other. Based on Eesti Pank figures, foreign banks control 87.6% of Estonia's banking assets. Although still dominant, the Scandinavian banks' market share has reduced following Danske Bank's decision to exit the Baltic States in April 2018, after a long-running money-laundering scandal uncovered in 2015 resulted in sanctions and dismissals at the bank.

Money-laundering issues aside, the Estonian Central Bank has demonstrated its willingness to embrace payments innovation through the introduction of its own government-backed digital currency, Estcoin. It would be introduced via an initial coin offering (ICO), an increasingly popular financing method whereby investors are issued with virtual coins in return for their investment cash.

Home to start-ups Transferwise, Monese and Pocopay among a host of others, Estonia remains committed to cleaning up its banking industry. The sophistication of its market can be seen in the fact that 80% of Estonians are now e-banking users, and the dominance of payment cards as a cashless payment instrument by volume, with a market share of 67.48% compared to 54.22% across the EU. The other major non-cash electronic payment instrument is credit transfers, accounting for 31.69% of all non-cash payments in 2018.

European payments hubs

> Since the advent of the first Payment Services Directive in 2007, financial services passporting has allowed a number of specialised centres to develop across the EU.

As has been discussed previously, one clear distinguishing factor in the European context in comparison to other regions of the world is the interplay between developments at a domestic level, and an ongoing harmonisation of regulation across member states of the European Union driven by EU-wide regulation and passporting. The ability to be regulated in one member state of the EU and offer services across the remaining 26 member states contrasts sharply with differing regulatory regimes per country or territory in East Asia, and indeed federal versus state level regulation in the USA.

Particularly since the advent of the first Payment Services Directive in 2007, financial services passporting has allowed a number of specialised centres to develop across the EU, where expertise and talent has reached a sufficient level of concentration for there to be a significant value add for payments companies to cover the entirety of the EU from a single regulated centre, rather than specifically focusing on one domestic market. Clearly, primus inter pares here was the UK. As an example, up to March 2019, close to half of European firms regulated as PIs or EMIs were regulated in the UK.[14]

The UK's exit from the EU in January 2020 and the passporting regime set to expire at the end of the transition period, have confirmed a number of alternative hubs which had developed a strong payments activity.

Ireland

Ireland has benefited from a traditionally strong relationship both with the UK and the US, and, post-Brexit, one of the few remaining common law environments in the EU. The regulator, the Central Bank of Ireland, has developed a good level of experience in the regulation of cross border financial services through the development of, in particular, the asset management industry in Ireland.

In the context of payments, early international payments companies in Ireland date back to around 2009 primarily providing services in the context of forex and remittances. Since 2018, these have been joined by a number of US big tech players (notably Google and Facebook), as well as a number of major firms setting up a presence in Ireland as a strategy in the context of Brexit (examples here including Prepaid Financial Services, Coinbase, and Stripe.)

Financial services firms who have relocated to Dublin, gained their licensing and are operationally ready, focus a lot more on 'business as usual'. The challenge for them now is running their newly regulated entities

[14] https://www.finextra.com/blogposting/16973/european-fintech-in-the-era-of-brexit

European payments hubs

from Ireland across the European jurisdiction where current market conditions are challenging.

Luxembourg

While primarily known in the context of asset management, private and corporate banking, and insurance, Luxembourg has also been a major centre for cross border payments for over a decade. Multilingualism, high levels of expertise with the regulation of cross-border financial activity, as well as a central European location are key factors for companies basing themselves in Luxembourg. Following Ebay, PayPal joined the Luxembourg financial ecosystem from 2007, operating with a banking license in the Grand Duchy that enables them to deploy their services across the European Union.

In 2008, Rakuten established its European HQ in Luxembourg as well as "Rakuten Europe bank" to support its merchant operations. In late 2015, Rakuten created a $100 million FinTech fund and has taken stakes in a multitude of disruptive start-up operations across Europe and North America. Prominent companies in the group's portfolio include Currency Cloud, Azimo, Payoneer, BlueVine and Kreditech.

Since 2010, Luxembourg has also seen strong development with regard to becoming a hub for major EMIs and PIs operating as part of multinational e-commerce groups. Licensed payments firms in Luxembourg include Amazon Payments, and, as a result of Brexit, the European hubs for Alipay, AirBnB, and Satispay. Alongside e-commerce, a group of major B2B focused payments firms also call Luxembourg home.

Luxembourg is also an emerging open banking centre. Local retail banks established LUXHUB, a provider of Open Banking API platforms, which is now reported to be the second largest open banking platform in Europe[15]. The other prominent player in the open banking field is Finologee, providing specialist offerings targeted at private banks, as well as a range of KYC tools.

Lithuania

Lithuania has seen strong growth in licensed payments firms following Brexit. This has been achieved by a very active role on the part of the central bank and regulator in promoting Lithuania as a quick jurisdiction for start-ups wishing to take advantage of EU passporting rights. In parallel, the banking industry and regulator continue to work on trying to improve the country's anti-money laundering (AML) record. In April 2018, Lithuania established a blockchain-based system for overseas businesses to remotely register and manage their company in the EU. These moves have led to a growth in the number of payments firms, particularly those from the UK looking for a minimal Brexit hedge.

In 2018, there were 49 e-money institutions (EMIs) resident in Lithuania, up from two five years previously: these included PaySera, Perlo Paslaugos, Lietuvos Pastas, and mobile network operator Tele2. In February 2020, the Lithuanian government claimed Vilnius to be one of Europe's top 4 FinTech hubs.

[15] https://www.luxhub.com/luxhub-ranked-in-the-top-3-open-banking-platforms-in-europe

Cashless Payments in Europe (2018, millions) as % of total per country

Country	Cards	DD	CT	Cheques	Other	Total
UK	**69%**	**15%**	**16%**	**1%**	**-**	**29,778.0**
France	**57%**	**18%**	**17%**	**7%**	**1%**	**23,498.1**
Germany	**24%**	**47%**	**28%**	**-**	**1%**	**22,656.0**
Netherlands	**54%**	**16%**	**29%**	**-**	**-**	**8,707.0**
Spain	**57%**	**24%**	**14%**	**1%**	**4%**	**8,184.6**
Poland	62%	-	37%	-	-	7,561.6
Italy	58%	14%	22%	2%	4%	6,699.6
Turkey	90%	-	9%	-	-	6,274.2
Sweden	66%	7%	27%	-	-	5,379.8
Belgium	50%	12%	38%	-	-	4,257.7
Luxembourg	97%	1%	2%	-	-	3,262.6
Norway	76%	4%	20%	-	-	3,235.5
Finland	62%	-	33%	-	4%	2,931.7
Denmark	77%	-	23%	-	-	2,756.5
Switzerland	57%	2%	41%	-	-	2,546.9
Portugal	73%	10%	12%	2%	3%	2,506.0
Czechia	55%	2%	43%	-	-	1,999.7
Austria	44%	23%	30%	-	2%	1,951.7
Ireland	65%	9%	22%	2%	1%	1,416.7
Hungary	65%	6%	26%	-	3%	1,286.0
Greece	56%	2%	28%	1%	13%	1,199.6
Slovakia	53%	3%	44%	-	-	973.2
Romania	68%	1%	31%	-	-	938.4
Croatia	43%	4%	44%	-	9%	782.2
Bulgaria	29%	1%	51%	-	20%	584.8
Lithuania	57%	-	32%	-	10%	577.3
Estonia	67%	-	32%	-	1%	504.4
Latvia	63%	-	35%	-	-	497.2
Slovenia	47%	10%	36%	-	7%	434.9
Cyprus	55%	7%	16%	9%	12%	128.8
Malta	58%	3%	24%	15%	-	63.0
Euro area						**90,430.7**
EU28						**141,493.5**
Table total						**153,573.8**

Note: DD = direct debits; CT = credit transfers; other = other payment services. Table total = EU28 + Norway, Switzerland and Turkey. Figures of less than 0.04 are included as 0.0 due to rounding and illustrated as a – (dash). e-money payments are included in card transactions.

Source: Payments, Cards and Mobile www.paymentyearbooks.com

European best practices: Overview

"We can easily guess which countries symbolise the best/early practice in the field of payments."

Our country-by-country analysis highlights a number of nations that have demonstrated their ability to be at the forefront of user-friendly technologies: the Nordic countries are the haven of instant payments and common digital IDs. The Netherlands have developed account-to-account digital payments since 2005. The Italians are mastering P2P like no one else.

Those advanced features do not entirely compensate for the less rosy aspects with the survival of some archaisms within the continent such as the use of cheques or the low acceptance of credit cards in some cash-oriented regions like Germany. As mentioned in the introduction, some observations do not reflect the actual maturity of a market but rather are matters of cultural preference.

We can easily guess which countries symbolise the best/early practice in the field of payments. The UK has led the way to Open Banking because it identified it as a way to foster competition. French banks understood since the 60's it was preferable to put their resources in common to create the basic infrastructure of their national card scheme. Spanish banks are the continental champions of e-wallets because their ease-of-use is the condition for reducing cumbersome cash payments. Italy, as a tourism destination for Chinese tourists, quickly incorporated AliPay and WeChatPay in its acceptance network.

Europe, the paradise of payments?

The picture is therefore contrasted but full of hopes. Excellent payment services are available, one way or another, within the European Union and the harmonisation brought by the regulation can only help the best players to benefit from a market the size of a continent and expand from their national base thanks to passporting, partnerships or consolidation.

The expected benefits are sizable: an infinite choice of payment tools for both European consumers and businesses, lower operating costs for users and merchants, better profits for the most successful providers.
As a conclusion, we will leave the reader with two take-aways:

First of all, basic ingredients of success are now widely known and increasingly available everywhere (mainly, instantaneous execution and openness of choice), operators can only differentiate through more sophisticated approaches. This will be our first key take-away number 1.

Second of all, as seen with the example of iDEAL in the Netherlands, Payconiq in Belgium, or CB in France, the local networks & solutions need to be interoperable on a larger geographical scale to blossom and fully unlock benefits. This will be our key take-away number 2.

An overview of European best practices

Key Take-Away 1: How winners make a difference

Our review of the global and European payments market in this paper demonstrates an industry in transition from traditional models – such as bank branches and cash payments – through card and electronic payments into the digital era. As alternative payments companies, big tech players and FinTechs encroach on the former preserves of "bricks and mortar" banks, winning organisations will differentiate themselves by putting their clients in charge of when they receive their services, the loyalty programmes from which they benefit, and even the design of their service packages, whether that's a current account with debit card (today's standard offering) or a multi-function wallet ready for use online and in the physical world, with a tailored loyalty programme that fits that specific customer's interests.

With the size of the world's payments market set to grow considerably faster than inflation year on year for the next five years[16], and digital payments taking an increasingly large slice of the overall market, there are plenty of opportunities for firms with the right approach to win big in the years ahead.

The customer: always in sight

Payments success in the digital era will come down to a combination of three elements:

- Knowing the customer. We are just at the beginning of a wide range of new technology innovations, from Artificial Intelligence (AI) and Machine Learning (ML) through to synthetic data sets. Currently most widely used in fighting fraud, the capacity for software to learn more about customers and predict behaviours based on previous interactions via AI and ML can also be applied to product design and service delivery. As banks get better at harvesting and interpreting the vast amounts of data available to them thanks to digital banking and payments, we should expect products and services to become more personalised. At the same time, consumer expectations of service delivery will rise...

- A flexible product offering. The digital revolution touches all of us in many different ways. The current COVID-19 crisis has accelerated a long-term trend towards working from home and the concept of the "gig economy", in which workers trade their skills and time for cash payments, rather than salaries and benefits. For the payments industry, this will increase demand for faster and safer settlement times, and for instant "push" payments from employers to employees, as those dependent on hourly wages paid irregularly expect to receive their money sooner. As part of the trend to digital wallets, we can also expect a revolution in the credit line, with expensive credit cards potentially giving way to lines of credit with interest rates linked to a consumer's credit score – or underwritten by their asset base. These examples alone demonstrate the extent to which we can expect payments to change in the next decade – and these are just the tip of the iceberg...

[16] https://www.mckinsey.com/~/media/mckinsey/industries/financial%20services/our%20insights/tracking%20the%20sources%20of%20robust%20payments%20growth%20mckinsey%20global%20payments%20map/global-payments-report-2019-amid-sustained-growth-vf.ashx

An overview of European best practices

- Dynamic technology. Delivering flexible products in a rapidly-changing digital environment means having dynamic, reliable technology at your fingertips. Technology which is capable, secure and efficient. Necova, a US machine learning company, estimates that the average US current account in the 1980s had around 5-10 debit payments or cheque withdrawals made against it each month, with the balance of expenditure as cash. Today's US urban millennial consumer, according to Necova, executes in excess of 130 electronic micro-transactions per week. Coping with this number of transactions alone implies more capable technology – to say nothing of the fact that those transactions could be split between credit, debit, standing orders, push payments and cash rails.

In such a fast-moving scenario, pitfalls for payments firms to be aware of include the interface between legacy systems and new technologies; failing to adopt a robust approach to risk management and fraud detection, and under-investment in new payments options like instant payments and payment by QR-code, both of which are rising at pace. While the Facebook mantra of "Move fast. Break things.", is not tenable for regulated financial institutions, tomorrow's winners are going to have to compete with big tech giants and FinTechs all hungry for a slice of the rapidly-growing global payments market. This implies an industry that needs to move faster and form partnerships for success.

Key Take-Away 2: global interoperability

As we explain above, the payments industry is just at the beginning of a very rapid period of change. If payments saw the rise of cards and, latterly, chips and electronic payments between 1970 and 2010, then today's story is about the rise of digital payments, and increasing competition between payment options to be "top of wallet" for consumers. The difference is that the switch to digital payments looks set to happen over ten to fifteen years, rather than forty.

From a consumer perspective, security, speed and ease of use are the most important factors when it comes to payments. There's a lot of literature out there about payments moving into the background over the next decade, or becoming "invisible." In practice, this will mean that the method of payment becomes less important than the platform or medium used to execute that payment.
As an example, consider the digital wallet on a mobile device – currently very much in the ascendancy as a payment method, and projected to capture between 30 and 50% of all payments in developed markets by 2025[17]. What matters to a consumer is the fact that this payment is secure from fraud and can be executed instantly and without friction. Whether the payment happens directly from their account, or via the medium of a debit or credit card, or even a "push payment" service, is of lesser importance to the consumer.

[17] See January 2020 research from Deutsche Bank: https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000504508/The_Future_of_Payments_-_Part_II__Moving_to_Digita.pdf

If recent hype around blockchain seems excessive, remember most of the hype about the internet twenty years ago has now come true – and then some.

Rising Platforms

If the platform will assume central importance, then there are a number of implications for today's payments industry, as follows:

- **Open Banking and Open APIs** – firms that currently operate digital platforms – from internet and mobile banking portals through to FinTechs and big tech companies – must embrace open banking and, as part of that embrace, must ensure that their Application Programming Interfaces (APIs) are open to engage with third parties, since partnering with other firms (see below) is about to assume vital importance...

- **Partnering and Venturing** – for some time, the payments industry has been about M&A activity to enter new markets or garner market share. In some segments, such as transaction processing, this will remain the case, as recent mega-mergers attest[18]. In other segments, though, firms will find it quicker and more cost-effective to partner and venture with "white label" product and service providers, adding to the existing customer offering on their platforms. There will be cultural and procedural challenges in this, especially for more established traditional banks.

- **Security is Paramount** – as platforms become the new norm, the challenge of interfacing between legacy systems and ultra-sophisticated new software will become more pronounced. At the same time, the spate of data breaches and thefts that saw $14.7 billion of fraud committed against financial institutions in 2018 alone[19] will not disappear. For these reasons, and others, payments companies must ensure their systems boast best-in-class security. Anything less will render them vulnerable to attack, with all the consequences to their operations and reputation this implies.

- **Don't discount blockchain** – those of us old enough to remember the late nineties and noughties will recall the hype of the "dot com" era, which led to the recession of 2000-2001. If recent hype around blockchain seems excessive, remember most of the hype about the internet twenty years ago has now come true – and then some. Although much of the $23.9 billion invested in blockchain between 2013 and 2019[20] may not see a return, there's no doubt this technology is now starting to gain traction, with IBM launching a global transaction settlement service based on blockchain.

[18] See FIS acquisition of WorldPay as one example: https://www.fisglobal.com/about-us/media-room/press-release/2019/07-31-2019-fis-closes-acquisition-of-worldpay-enhancing-its-global-technology-leadership

[19] See Javelin Research 2019 Fraud Study: https://www.javelinstrategy.com/coverage-area/2019-identity-fraud-study-fraudsters-seek-new-targets-and-victims-bear-brunt

[20] See Outlier Ventures report: https://outlierventures.io/research/investments-in-blockchains-2019-23-7-billion-raised-by-3738-blockchain-companies-since-2013/

GLOSSARY

AI: Artificial Intelligence

Characterised as "a system's ability to correctly interpret external data, to learn from such data, and to use those lessons to achieve specific goals and tasks through flexible adaptation", in financial services terms this means the capacity of banking and payment systems in an organisation to interpret and draw lessons from customer, transaction, fraud and other operational data to improve the functioning of those systems, strengthen fraud defences, and create new products and services for customers.

ATM: Automated Teller Machine

or cash machine. In the next five years, these machines – traditionally used to dispense cash and in some cases accept deposits, will become much more capable, with sensing equipment and document recognition scanners.

EMV the Europay, Mastercard, Visa (EMV) standard of data encryption for electronic payments, designed as part of a concerted effort by the payments industry more than twenty years ago to improve fraud protection. The EMV standard was rolled out on cards alongside new hardware (a chip on the card, replacing the magnetic stripe), and a generalised move from signature as a form of user verification to the use of Personal Identification Numbers (PINs). These changes had a dramatic effect, greatly reducing the incidence of fraud wherever they were introduced.

Faster Payments (FP) reduce payment times between different banks' customer accounts from the three working days that transfers take using the long-established systems to typically a few seconds. Previous faster payments systems provided a limited faster service (by close of business that day) for "high value" transactions: however, today's FP systems are focused on the much larger number of smaller payments, subject to limits set by the individual banks, with some allowing Faster Payments of up to $250,000 which can be settled immediately.

Machine Learning (ML) is defined as the study of computer algorithms that improve automatically through experience. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to do so.

Point of Sale (POS) transactions that take place at a merchant's place of business.

SCT-INST: The Single European Payments Area (SEPA) Instant Credit Transfer (SCT Inst), also called SEPA Instant Payment, provides for instant crediting of a payee (less than ten seconds, initially, with a maximum of twenty seconds in exceptional circumstances). This scheme was launched in November 2017, and was at that time operational for end customers in eight euro zone countries, and is expected to be available in most eurozone countries soon.

Personal Notes

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www.paymentscardsandmobile.com

Alex Rolfe
Publisher
alex@paymentscm.com

James Wood
Managing Editor
james@paymentscm.com

Adam Unsworth
Head of Design
adam@paymentscm.com

Contact us

Nicolas Mackel
CEO
Luxembourg for Finance
nicolas.mackel@lff.lu

Thibault de Barsy
General Manager
Emerging Payments Association EU
thibault.de.barsy@emergingpayments.eu

Robert Jan Jarvis
FinTech Advisor, Head of US & Canada desk
Luxembourg for Finance
robert.jarvis@lff.lu

Chris Hollifield
FinTech Advisor, Head of China desk
Luxembourg for Finance
chris.hollifield@lff.lu

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