



The Digital Transformation of the Global Economy and the Portuguese Retail Payments System

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Executive Summary

This report explains how competition in providing consumer payments is evolving, with particular attention to the role of the digital transformation and multinational tech players, and the implications for the development of the Portuguese consumer payment system over the coming years. “Consumer payments” refers to how people pay businesses for goods and services and is sometimes referred to as retail payments. “Tech” refers to using internet-based technologies to provide services.

The Portuguese Payment System

Portugal has a robust, efficient, and innovative payment system – one that compares well, based on the current situation and historical trends, to the EU-5 as well as to the EU-19 average.¹ There is widespread availability of digital payments at physical points-of-sale (POSS) as well as online points-of-purchase. A unique feature of Portugal is the dense network of ATMs that facilitate remote transactions, such as bill payments, in addition to dispensing cash.

Innovative payment methods enable Portuguese consumers to use their smartphones to pay at physical POSs, using contactless or QR Codes, and to pay online with secure virtual cards as well as other convenient methods. The API Market provides a platform for FinTechs to provide value-added services tied to payment accounts with Portuguese banks. The percent of consumer payments made with cash rather cards has declined significantly since 2014.

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In addition to the global payments providers Portugal, like some other EU countries, has a successful domestic provider. SIBS develops and provides shared infrastructure including the ATM network, card processing, the MB WAY mobile payment method, and the API Market. Owned by 21 Portuguese banks, SIBS helps achieve scale and scope economies for a country of about 10 million people, and for expanding

¹ The EU-5 are the largest economies in the EU, based on GDP: Germany, France, Italy, Spain, and Netherlands. The 19 EU countries are those included in the SPACE survey, sponsored by the European Central Bank, which is a major source of consistent data on consumer payments in the EU. Those countries are Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Slovakia, and Spain. The EU-19 comprise 85 percent of EU GDP. All EU averages in this report are weighted by population.

internationally. It has been the key driver of payments innovation in Portugal and for developing differentiated solutions that can compete with global firms. From its base in Portugal, it has expanded to Poland and Romania, in addition to several African countries.

Digital Transformation and Payments

The evolution of the Portuguese payment system over the coming years will take place amidst the digital transformation of the global economy. It will be influenced by digital technologies, which are revolutionizing many sectors of the economy, including payments.

The gradual encroachment of the digital economy began with the start of the commercial internet. It accelerated because of the widespread deployment of ever faster cellular networks, the ubiquitous adoption of smartphones, and the rise of the app economy. The pandemic provided a further boost by nudging people to use online solutions and overcoming inertia that adhered consumers to traditional ones. The digital transformation is spreading through more sectors such as banking, commerce, health, transportation, and media. It is increasing domestic competition because the new technologies and business models reduce national entry barriers.

Payments, which every sector relies on, is also undergoing rapid disruptive innovation. There are increasing opportunities to use internet-connected solutions at physical POSs, in providing app-based services in the physical economy, and through online transactions. And digital technologies are spawning new ways to pay thereby further reducing frictions in how consumers pay and businesses get paid for purchases.

As a result, competition has become more dynamic, and will become more so over time, as non-traditional players enter payments and traditional ones embrace digital technologies. BigTech – the global tech giants with vast numbers of users – have entered many countries, with Apple Pay one of the highly visible products.² FinTechs – firms such as PayPal and Stripe that use digital technologies to provide financial services – have moved into banking and payments in the EU, UK, and other countries. Government policies on open banking, along with the development of complementary global infrastructure such as instant-payment networks, have spurred recent growth of firms such as Revolut.

The sheer volume, investment, and scope of initiatives indicate that BigTech and FinTechs will prove important in driving dynamic competition in payments and financial services. Meanwhile, Visa and Mastercard, the two global card networks, have made significant investments, often through acquisitions, to extend their reach into supporting tech firms.

This digital transformation is seen increasingly in Portugal. At the physical point of sale, MB WAY is competing for transactions with Apple Pay and Google Pay. Online, MB WAY competes for transactions with PayPal, Apple Pay, Amazon Pay, and other digital payment solutions.

The Rise of Global Players and the Fall of National Boundaries

Cross-border competition and entry are also intensifying, and not just because of the digital transformation.

Mastercard and Visa continue as the two dominant global networks for debit and credit cards. Through acquisitions and investments, they have moved into providing platforms for open banking, instant payments, and crypto. And they are doing so across many different countries.

The consolidation of payment service providers such as Worldline's acquisition of Ingenico, are also creating global behemoths. The integration of multinational banks and FinTechs, such as Santander's PagoNxt, are increasing cross-border competition.

In the EU, national boundaries for payments and related financial services have largely disappeared. Key regulations are standard across Europe and payment service providers can operate across different markets with a single passport from a recognized country authority.³ To further this integration, the European Central Bank (ECB) and the European Commission are pursuing various efforts to devise pan-European payment solutions, such as SEPA Instant Credit, based on interoperable instant payment schemes.

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FinTechs, from mature ones such as PayPal to newer ones such as Revolut, have entered Portugal and are creating complementary payment and banking solutions for Portuguese consumers and merchants. They supplement other traditional international players, such as Worldline, which have been in Portugal for some time but are increasing their presence as part of their global expansion.

Government Regulation, Innovation, Dynamic Competition

Government policy needs to balance promoting innovation, sound regulation, and competition policy. That widely accepted proposition has several implications for payments, and related financial services, generally, and in Portugal.

Four features of the current and evolving state of competition in payments described above are noteworthy in evaluating these tradeoffs:

1. there is a high rate of innovation in payments with no signs of this abating in the coming years;
2. innovations in payments are coming from a much wider range of sources than a decade ago;
3. this dynamic competition is taking place globally as technologies and business models make national entry easier; and
4. the EU has largely succeeded in creating a single payments area making national boundaries even less relevant across its 27 member states.

³ Any financial institution or payment service provider authorized in one Member State can provide services within the European Union without having to comply with each national set of rules and regulations. Essentially, the entity is not answerable to the regulatory authority of the country where the services are provided, but rather the regulatory authority of the country where the entity is authorized.

Domestic and traditional firms continue to play significant roles in this dynamic and global competition. They are embracing the new technologies and leading the digital transformation as seen in Portugal with the launch of MB WAY in 2015, several years before BigTech mobile payment methods entered. In some cases, domestic and traditional firms, through differentiated offerings, may end up having better solutions than large, new players. And just as domestic firms face competition from multinational ones, domestic firms also have more opportunities to grow regionally and globally.

In light of this, government policymakers should keep three key principles in mind in considering where to strike the right balance between innovation and regulation.

Principle 1: No Business Model Bias. Regulation should avoid bias for or against different types of players, particularly given uncertainty over the risks and rewards of various solutions. When regulations have a sound basis, such as in protecting consumers or the safety of the financial system, they should be applied to innovators, including BigTech and FinTech firms. When they lack a sound basis, perhaps because innovations or other changes in circumstances render them unnecessary, they should be relaxed for traditional players as well as not being extended to new ones.⁴

Principle 2: No Firm Location Bias. Regulations should avoid bias for or against domestic players. Consumers benefit from competition regardless of the home base of the company. Biases against domestic firms can arise when regulators place too little weight on competition from tech players, which can become powerful competitors quickly, as a result of network effects and scale economies combined, and too little weight on the likelihood of entry by non-domestic tech and traditional firms. It can also arise when domestic firms face competition from firms operating with a passport from firms domiciled in countries with lighter regulations, creating an unlevel playing field in the domestic market.

Principle 3: Limit Free-Riding. Regulatory policy should avoid allowing BigTech and FinTech firms from free riding on traditional players, including the use of infrastructure, intellectual property, and customer acquisition. Doing so ultimately suppresses valuable investment by traditional players and can harm all players. The risks of doing so are apparent from the policy decisions in the early years of the commercial internet that shielded internet platforms from libel laws and laws on infringing intellectual property rights.

Competition authorities need to be particularly careful about avoiding these biases in considering markets for merger and abuse of dominance investigations. That can arise in defining markets that are too narrow, because they ignore dynamic competition and cross-border entry, and thereby overstate the market power of domestic players.

Regulatory policy should, of course, also avoid creating barriers that prevent efficient competition and innovation from tech firms, thereby protecting incumbents from gales of creative destruction. It can do that in practice by carefully avoiding biases that are ungrounded in the realities of competition in payments and related financial services, today and for the foreseeable future.

⁴ For a general framework for assessing tech regulation see Evans, David S. (2021) "Tech Reg: Rules for the Digital Economy," CPI TechREG Chronicle, December 2021, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3969436.



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Introduction



Every day, on average, more than 4 billion euros change hands between Portuguese consumers and businesses.⁵ These payments take place with cash, cards, checks, direct debits, and credit transfers; at physical locations and online using browsers and apps; and with mobile apps at physical locations. More than 14 million transactions take place on an average day.⁶ Businesses earn money and consumers receive goods and services. The process typically works so seamlessly that everyone forgets that the payments system is a critical part of the lives of Portuguese households and businesses.

Payments is far from a static business. Much has changed in the last decade. Not long-ago, for example, people paid with cash, or possibly a card, when they took a taxi. Now it is common for people to have an app on their smartphone which uses a payment method they have registered to pay on-line, automatically, when they've completed a ride with app-based ride-hailing services. That “invisible payment” is an example of the digital transformation in which people are using innovative internet-based solutions, including when they are out and about in the physical world, to purchase goods and services.

A decade ago, in Portugal as in many developed countries, consumers and businesses mainly relied on domestic players, as well as international card brands, for their payment needs. Today, internet-based firms, often operating globally, are making significant inroads. Google does not just want people to use it for search – it wants people to use G Pay for payments online and with its Android phones at physical stores. FinTechs are using authorized access to consumer payments accounts at traditional banks to provide value-added services, including payments and credit. PayPal, one of the first FinTechs, is one of the most popular methods for paying online. MasterCard and Visa through acquisitions are providing platforms for FinTechs to access bank accounts and to facilitate crypto payments which have, or will, touch Portugal. Meanwhile, the realization of a true single European payments area, EU initiatives to promote pan-European solutions, and the consolidations of large multinational payment service providers promise to, or already are, intensifying cross-border competition.

This report explains how competition for providing consumer payments is evolving, with particular attention on the role of the digital transformation and the crumbling of national boundaries, and the implications for the development of the Portuguese consumer payment system over the coming years.

⁵ Global Data (2021) “Portugal Cards & Payments: Opportunities and Risks to 2024” at pp. 2, 8; S&P Capital IQ. Global Data reports the transaction volume in U.S. dollars for payments cards and payment cards’ share of total transaction volume across all payment instruments, which I used to compute the total value of payments. I convert U.S. dollars to euros based on the average exchange rate during 2020 based on data from S&P Capital IQ.

⁶ Global Data (2021) “Portugal Cards & Payments: Opportunities and Risks to 2024” at p. 8. Global Data reports the number of card transactions and card transactions share of total transactions, which is used to compute the total volume of payments.

This Introduction presents background and an overview of the issues addressed in the report. Chapter II describes the competitive landscape for payments, with particular focus on the digital transformation along with the increased ease of competing globally, and relevant regulations for digital and payments firms in Europe. Focusing on Portugal, Chapter III examines the progress the country has made in developing and adopting innovative digital payment methods, largely driven by domestic firms, and the increasing role that multinational players, such as BigTech, are playing. Chapter IV considers the implications of the digital transformation and the crumbling of national boundaries for government regulation and competition policy. Chapter V concludes.

A. What Consumer Payments Are About

Payment methods enable consumers to pay for goods and services and businesses to receive funds and in doing so enable economic life. They also enable people to send and receive money.

Modern payments services have evolved into a broad collection of services. Besides just swapping money, these services may include providing credit to the consumer, ensuring the timely receipt of funds for the merchant, reducing transaction risks for both the consumer and the merchant, making paying convenient for the consumer, and making acceptance of payment convenient for the merchant. Of course, the direct and indirect costs of making and receiving payments are also important features for both consumers and merchants.

Continual innovations have made payments more efficient by eliminating frictions or by handling new payment needs. The amount of time that it takes consumers to pay at physical points of sale has declined over time to a few seconds. Recent innovations, such as contactless, squeeze out even more time. Payments have become easier, faster, and more secure online for consumers and merchants.

Despite innovations, however, sweeping changes take place slowly because of ingrained habits and sunk investments. There has been a long historical slide in the use of paper-methods of payment. Consumer payments with cash have declined sharply in the last decade but still account for a substantial share of payments in most EU countries including Portugal. On the flip side more people are using their mobile phones to pay at stores although, currently, the percent of payments made this way are small.

B. Basic Concepts in Consumer Payments

Payments involve a complex web of pieces.

The money has to come from somewhere: that could be directly from the consumer's payments account as is the case with direct debit; from the consumer's credit card issuer who fronts the payments and bills the consumer later; or from cash the consumer has in her wallet which she has probably gotten by using an ATM to withdraw cash from her payments account.

The consumer must have a way to pay. Typical ones are debit and credit cards, digital and mobile wallets, direct debit, cash, and in-app payments; these usually involve physical methods for interacting with POS terminals offline, and credentials that can be provided online. The merchant must have ways to take those payments which involve physical terminals at the point of sale and software for browsers and apps.

A business ecosystem has to provide the services necessary for payments to work seamlessly for consumers and merchants. Key players include:

- banks which hold consumer deposits, enable account-to-account payments, issue debit/ATM and credit cards, and work with merchants as acquirers;
- card networks that operate brands, and settle transactions, between cardholders and accepting merchants or their agents;
- payment processors that help merchants take payments and collect funds from the consumer's source of funds;
- digital and mobile wallet providers that provide convenient ways for consumers to pay online, and in some cases offline, and for merchants to collect money;
- ATM networks that enable consumers to take cash from their bank accounts and banks to provide this service, as well as other services that can be provided using the ATM;
- other payment providers such as those that specialize in remittances and bill payment as well as terminal manufacturers, cash-in-transit providers; and,
- central banks that supply cash, operate gross settlement services for banks, and devise or enforce regulations, along with national legislatures and other supervisors.

C. Payments Innovations and Global Competition

Payments is one of the oldest industries. It has been important for commerce ever since the invention of money replaced barter millennia ago. Payments became digital long before the commercial internet – around 1870 when it became possible to send and receive money over telegraph networks. A century later, and quarter century before the launch of the commercial internet, card networks began conducting vast amounts of transactions online over private computer networks. The pre-existing card-based digital methods were critical for the launch of commercial websites in the mid 1990s and mobile apps in the late 2000s.

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By giving entrepreneurs more sophisticated tools, new digital technologies have increased the pace of innovation. Small merchants can, for example, now take debit and credit cards on their smartphones rather than having to get expensive terminals. Any web developer can insert a small piece of code in their software that enables them to process payments for consumers in many countries for domestic and international payment methods. The opportunities for innovation have also expanded as more businesses take payments online and through mobile apps.

Mastercard and Visa, propelled by network effects and scale economies, became the dominant global card networks, and debit and credit cards became the main way people pay online and, aside from cash, at physical stores. Even when people pay with a digital wallet, such as the Starbucks mobile app or PayPal, they have probably registered a payment card, often with a Mastercard or Visa bug on it, to tap into their funds.

The digital technologies have given rise to a new generation of global payments players in addition to the card networks. Of the five Big Tech firms only Microsoft does not have a significant global payments business. PayPal was one of the first FinTech firms – specializing in online financial services, starting in 1998. There

has been substantial entry – firms such as Adyen in payment processing, Klarna in consumer credit, and Wise for remittances – in the last decade. These firms have scaled globally quickly because they do not need to create much domestic infrastructure.

These developments are important for understanding the evolution of payments and competition in national markets. There have been global players, such as Visa, for many years but few of them. Now Big Tech, the largest global companies by far, and FinTechs, including large ones such as PayPal and Block, are investing in being payments providers or growing their existing businesses. And the digital transformation that is sweeping across most sectors – with the formation of many startups, rapid innovation, and substantial investment – is occurring in payments. Large traditional players, seeing the increased dynamic and global competition, are investing in tech and expanding their global footprint, often through acquisitions.

These trends are accentuated in the European Union which has made great strides in creating a single European payments area and in creating integrated innovative pan-European payment solutions. Although globalization has had some political setbacks, it remains a potent force in most of the free world.

For domestic economies, such as Portugal, these multinational players will complement domestic offerings as well as providing new sources of competition for incumbent players. The next chapter discusses the digital transformation and the globalization of competition, and what these trends mean for payments, in more detail.

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The Digital Transformation, Global Competition, and Payments



Consider what happens when a person gets an Uber in Lisbon. She uses the Uber app on her smartphone which then communicates with Uber's servers in the cloud. Uber then communicates with a driver, based on location, who also has an app on his phone. These communications all take place over the internet which is comprised of mobile broadband operated by national cellular carriers as well as fixed broadband pipes that span the country and the globe.

After this matchup, when the ride is completed, Uber takes care of charging the rider, who stored her payment credentials previously in the app, and paying the driver, who has bank or other payment details on file with Uber. This invisible payment, which doesn't require that the rider or driver interact and spend their time at the end of the ride, was an important innovation for ride-sharing. Settling-up was a material friction with traditional taxis.

Ride-hailing services like Uber have introduced innovation, and new competition, into a physical sector, transportation, by using digital technologies. The digital transformation refers to similar changes that are taking place across sectors. An increasing portion of economic activity is being powered, in some way, through an internet connection, which enables associated technologies. Payments is often an integral part of this transformation.

Although other dynamics are in play, which we touch on in this chapter, digital technologies are the most important driver of innovation and competition today and for many years to come.

A. Drivers of the Digital Transformation

Most everyone, certainly in developed countries like Portugal, but even globally, is connected to the internet. Domestic cellular networks, with mobile broadband fast enough to provide efficient access, cover most places people live. Of people living in developed countries 99 percent have access to a 4G network and the same percent holds in Europe.⁷ In developing ones 94 percent have access to at least a 3G network with 85 percent having access to 4G.⁸ All people need is a smartphone and a data plan which most adults, living in developed countries have, and a large portion in developing ones. In 2021, there were 0.68 smartphones with

⁷ International Telecommunication Union (2021) "Measuring digital development: Facts and figures 2021," at p. 11, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>.

⁸ International Telecommunication Union (2021) "Measuring digital development: Facts and figures 2021," at p. 11, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>.

data plans per capita in Europe and 0.50 per capita globally.⁹ Many households also have fixed broadband subscriptions: 36 subscriptions per 100 inhabitants in developed countries (35 in Europe) and 13 per 100 inhabitants in developing ones.¹⁰ Over the next few years cellular networks will complete the deployment of 5G technology, which will result in almost every inhabitable point on earth having a connection that can transmit large amounts of data at very fast speeds and extremely low latencies.¹¹

With an internet connection, intermediaries can connect everyone – people and businesses – with everyone else and connect smartphones, personal computers, and other computing devices to the cloud – remote servers – where much of the work takes place. These intermediaries make use of software-based technologies, including machine learning, involve big data. Most aspects of this digital infrastructure are undergoing rapid improvement and innovations such as through artificial intelligence and quantum computing.

Entrepreneurs have been using internet-connected technologies to innovate existing industries and create new ones, all of which is happening on a global basis. The internet initially led to a distinct online world mainly involving a consumer sitting at a computer and using their browser to interact with websites. Then smartphones and cellular networks made digital technologies available most everywhere and all the time. That penetration has enabled entrepreneurs to innovate various aspects of the physical economy as the ride-hailing example illustrates.

It is now sweeping across other sectors such as the new field of telemedicine where patients can visit doctors virtually and where 5G technology holds out the promise of remote surgeries. Software, data, and connections are also helping to integrate diverse services (smart watches that capture health data that can be ported to health providers is an example) and creating “superapps” that provide diverse services in a single application (for example, the Uber app integrates ride-sharing, meal delivery, online grocery shopping, and booking live events and restaurants).

As with other new technologies, such as electricity, these changes are taking time – measured in decades – to work their way through the economy. In 2019, about 25 years after the launch of the commercial internet, e-commerce accounted for only about 10 percent of retail sales in the EU-5 on population-weighted basis as shown in Figure 1.

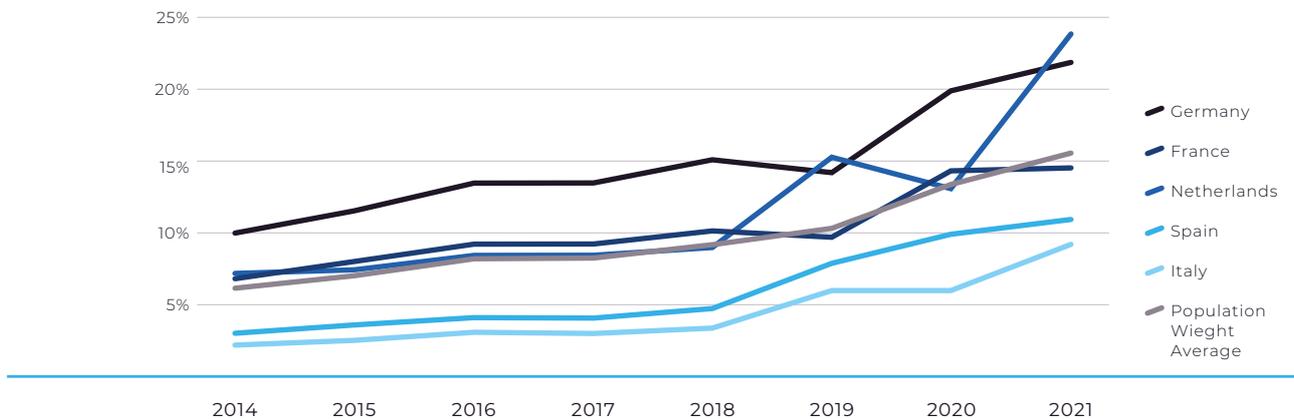
The pandemic, however, has given the movement online a substantial boost. It made online relatively more attractive than offline and helped overcome inertia that made people stick to their offline habits. The figure shows the 2020 uptick in e-commerce, with e-commerce accounting for about 16 percent of retail sales in the EU-5 in 2021. Other activities have seen similar surges. As the pandemic limitations wane, online will give up some of this boost, as people return to traditional methods, but some will likely persist, as a result of more people learning about and liking online options they’ve tried. More and more people, from young to old, are accustomed to doing things digitally.

9 The statistics are estimated by multiplying the percent of total population that has a cellular data subscription by the percent of cellular connections accounted for by smartphones. See GSMA (2022) “The Mobile Economy 2022,” <https://www.gsma.com/mobileeconomy/wp-content/uploads/2022/02/280222-The-Mobile-Economy-2022.pdf>, at pp. 6-8. All European Union countries, Albania, Andorra, Bosnia and Herzegovina, Iceland, Kosovo, Liechtenstein, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, United Kingdom, and Vatican City are included in the Europe estimate.

10 International Telecommunication Union (2021) “Measuring digital development: Facts and figures 2021,” at p. 8, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>. The countries included in the Europe estimate are: Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Rep. of North Macedonia, Turkey, Ukraine, United Kingdom, and Vatican City.

11 Portugal is starting later than many other developed countries. Following the recent completion of a spectrum auction cellular networks in Portugal will begin making 5G available.

Figure 1 Retail E-Commerce Sales as Share of Retail Trade the Five Largest European Countries (EU-5), 2014-2021¹²



Sources: Centre for Retail Research; Statista; The World Bank

Digital businesses typically start locally but often expand globally when they have a product with broad appeal. Although they may need to customize their products or services for local markets, they can serve the world from centralized servers and reach customers who have no more than a smartphone and data plan. They can achieve substantial growth, relatively quickly, as a result of low national barriers to entry, scale economies, and network effects. Examples from the wave that entered in the 2010s include Airbnb, Spotify, Telegram, and Uber. Of course, many countries also have successful digital businesses that remain largely local, in some cases because those businesses solve local needs very well with differentiated offerings.

B. Global Card Networks

In the US and many countries, the chances are that when people pay with PayPal, their Uber app, or Google Pay they are using a Mastercard or Visa payment card whose details they entered into their account. That is on top of online transactions where they enter their card details directly.

Of course people aren't actually using a plastic card for any of this except for tapping their account number and other digital card information.

Mastercard and Visa, or their predecessor organizations, entered payments in 1966. They started as B2B platforms that connected banks that issued cards to consumers, and with acquirers and processors who worked with merchants to take card payments. Relying on private communications networks, they became large, global, digital businesses long before the commercial internet started.

In most developed countries, and many developing ones, banks mainly issue Mastercard and Visa credit cards. In many of those countries, such as the United Kingdom, banks also predominantly issue Mastercard and Visa debit cards, while in other countries, such as France, banks rely on domestic debit/ATM networks.

¹² Statista, "Retail e-commerce sales as share of retail trade in selected countries from 2014 to 2021," <https://www.statista.com/statistics/281241/online-share-of-retail-trade-in-european-countries/>; The World Bank, "Population, total," <https://data.worldbank.org/indicator/SP.POP.TOTL>.

Table 1 reports the debit and credit card shares of transactions for the two global card networks in 14 European countries in 2020. The UK has a high share because banks rely on them for both debit and credit cards while France has a low share because it has a domestic debit card scheme and the French do not use credit cards much. The share of Mastercard and Visa exceeds 95 percent in 7 of the 14 countries.

Table 1 Share of Card Transaction Value by Brand, 2020¹³

County	Visa	Mastercard	Domestic Solution	American Express	Others	Visa + Mastercard
Belgium	11%	4%	80%	1%	5%	15%
Denmark	16%	15%	68%	0%	0%	31%
Finland	55%	44%	0%	0%	0%	99%
France	1%	3%	84%	1%	10%	4%
Germany	29%	28%	37%	6%	0%	57%
Ireland	91%	9%	0%	0%	0%	100%
Italy	35%	39%	25%	1%	0%	74%
Netherlands	11%	88%	0%	0%	0%	99%
Norway	30%	29%	28%	2%	11%	59%
Poland	51%	49%	0%	0%	0%	100%
Spain	29%	20%	50%	1%	0%	49%
Sweden	28%	70%	0%	2%	0%	98%
Turkey	54%	42%	3%	1%	2%	96%
United Kingdom	84%	14%	0%	1%	0%	98%

Source: Worldpay; Statista

Mastercard and Visa, however, account for most cross-border transactions in the European Union. Cards for the domestic schemes are not accepted outside of their respective countries. Banks that issue the debit cards for domestic schemes therefore typically include a Mastercard or Visa bug on the card which enables the consumer to use the card to pay internationally as well as to withdraw funds from foreign ATMs. The same situation is true for most other countries around the world that have domestic card networks.

The fact that many consumers already had payment cards from Mastercard, Visa, or domestic card networks was critical to the growth of internet commerce. It was relatively easy for a website, working with merchant processors, to accept cards online and for consumers to enter their card details. Consumers could also register their card numbers on websites, such as with Amazon's one-click method, and with a digital wallet, most importantly PayPal, for repeat use. Cards also proved important for app-based transactions, such as with Uber, where consumers could register their card in their account. Countries that have lacked sufficient card penetration have often had to resort to cash on delivery or other methods that are cumbersome for online sellers and buyers.

In recent years, Mastercard and Visa have expanded from their core strengths in cards to other payment methods that are relevant to the digital transformation. Mastercard, through its acquisition of Vocalink in 2017, provides clearing and settlement solutions for account-to-account real-time payment (also known as

¹³ Statista, "Market share of international and domestic payment card schemes in 15 countries in Europe in 2020," <https://www.statista.com/statistics/1116580/payment-card-scheme-market-share-in-europe-by-country/>.

instant-payment) systems.¹⁴ As discussed below, Mastercard and Visa have acquired FinTechs that provide platforms for other FinTechs to access customer payment accounts at banks and thereby provide a variety of financial services often in competition with the banks. Mastercard and Visa have both launched initiatives to facilitate payment with cryptocurrencies.¹⁵

C. BigTech and Payments

Alphabet, Amazon, Apple, Meta, and Microsoft are often referred to as Big Tech.¹⁶ Each of them has a significant position in one or more key parts of the digital economy, operates globally, have hundreds of million active users and, except for Meta, market caps in excess of \$1T. Table 2 summarizes their revenue, profit and users for 2021 and their market caps as of 1 April 2022. We will use the popular names, Google and Facebook to refer to Alphabet and Meta respectively in the remainder.

Table 2 Summary of Big Tech Financials During 2021 (Figures in \$US Billions)

Company	Market Capitalization	Revenue	Net Income	Number of Users
Amazon	\$1,664	\$470	\$33	~300 million
Alphabet/Google	\$1,856	\$258	\$76	>3 billion
Apple	\$2,845	\$378	\$101	>1 billion
Meta/Facebook	\$612	\$118	\$39	~3.6 billion
Microsoft	\$2,320	\$185	\$71	>1 billion

Source: S&P Capital IQ

Note: Market Capitalizations are as of April 1, 2022.

Each of these firms has expanded from core strengths to other parts of the digital economy and are investing in new areas. Table 3 summarizes key areas where they are present. Amazon, Google, and Microsoft operate the largest cloud-service businesses which are critical components of the infrastructure for the digital economy.

¹⁴ See, for example, Payments Canada, “Payments Canada selects Mastercard’s Vocalink as the clearing and settlement solution provider for Canada’s new real-time payments system, the Real-Time Rail,” November 12, 2020, <https://www.payments.ca/about-us/news/payments-canada-selects-mastercard’s-vocalink-clearing-and-settlement-solution>.

¹⁵ CoinDesk, “Mastercard Outlines 3-Pronged Strategy to Support the Growing Crypto Community,” November 20, 2021, <https://www.coindesk.com/business/2021/11/10/mastercard-outlines-3-pronged-strategy-to-support-the-growing-crypto-community/>; Visa, “Unlocking crypto opportunities,” <https://usa.visa.com/solutions/crypto.html>.

¹⁶ Since Google accounts for virtually all of the revenue of Alphabet, its parent, this report uses the more familiar name. It also refers to Meta with the more familiar Facebook.

Table 3 Big Tech Ecosystems

Service	Alphabet (Google)	Facebook	Apple	Microsoft	Amazon
Search	Google Search	-	-	Bing	Amazon.com (product search)
Marketplace	Google Shopping	Facebook Marketplace	-	Bing Product Search	Amazon Marketplace
Voice/video calling	Google Duo, Google Meet	Facebook Messenger, WhatsApp	iMessage, FaceTime	Teams, Skype	Echo Show, Amazon Chime, Alexa App
Payments	Google Pay	Facebook Pay	Apple Pay	Microsoft Pay	Amazon Pay
Cryptocurrency/ Stable Coin	-	Diem	-	-	-
Operating systems	Android, Chrome OS	-	iOS, macOS	Windows	Amazon Fire OS
Social Networking	-	Facebook, Instagram, WhatsApp	-	LinkedIn	Twitch (gaming focused), Goodreads (books focused)
Cloud Storage and Cloud Computing	Drive, Google Cloud (for enterprises)	-	iCloud	OneDrive, SkyDrive, Azure	Amazon Drive, Amazon Web Services
Photo Storage	Google Photos	Facebook Photos, Instagram	iCloud Photos	OneDrive	Amazon Photos
App Store	Google Play	-	App Store	Windows Store	Amazon Appstore
Artificial Intelligence	DeepMind, TensorFlow, integration into various other products	Facebook AI	Integration into various products	Microsoft AI	Amazon Web Services
Streaming Device	Chromecast	-	Apple TV	Xbox	Amazon Fire Stick, Amazon Fire TV
Entertainment: Music, Movies, eBooks, Games	Google Play, YouTube, Google Podcast	Facebook Watch, Games	iTunes, Apple TV, App Store	Xbox Live, Windows Games, Windows Store (no eBooks),	Amazon Music, Prime Video, Games, Kindle
Online Advertising	AdWords, AdSense, Analytics, DoubleClick	In NewsFeed Audience Network	Apple Search Ads	Bing Ads, Microsoft Advertising	Amazon Advertising
News	Google News, Google AMP	NewsFeed, Instant Articles	Apple News	Linked-In	-

Amazon, Apple, Google, and Facebook have developed large global payments businesses and continue to develop and invest in them.¹⁷ Table 4 summarizes key features of them.

1. Apple

Apple prompts users of its products and services to set up an Apple ID which authenticates the user within the Apple ecosystem. It then encourages the user to attach a payment credential that they can use to purchase digital products and services from Apple. People need to have an Apple ID, for example, with a payment credential to pay on the App Store including for in-app content. Apple began the Apple ID payment method in 2003 when it launched iTunes.

Amazon, Apple, Google, and Facebook have developed large global payments businesses and continue to develop and invest in them.

The company does not report the number of Apple ID accounts with payment credentials. There are, however, about a billion iPhone users globally, most of whom would need to have an Apple ID to download paid apps and in-app content from the App Store. According to public estimates, iPhone users spent about €72 billion in the App Store in 2021.¹⁸

Apple launched Apple Pay in October 2014. iPhone users could register a credit and debit card for banks that agreed to work with Apple and pay with Apple Pay at physical merchants that had contactless terminals. Apple reports that 85 percent of US merchants accept it as of 2021.¹⁹ Apple has also made Apple Pay available as a payment option for third-party online merchants in competition with PayPal. Apple Pay was reportedly available in 72 countries as of March 2022.²⁰ In the US, but not elsewhere, consumers can use Apple Pay for person-to-person payments.

Apple does not report statistics on the use of Apple Pay. PYMNTS.com, a media and analytics business, has been tracking the use of Apple Pay in the US since its launch in 2014 through consumer surveys. It estimates that, on an annual basis, the volume of transactions made with Apple Pay in US physical stores increased from about \$4.5 billion in 2015 to \$91.7 billion in 2021. That increase occurred as a result of more people having iPhone models that could use Apple Pay, more merchants taking it, and the general increase in retail sales. That is still a small portion of overall in-store retail sales – about 1.8 percent in the US in 2021.

17 Microsoft does not have significant digital consumer-facing business nearly as large as these players and is therefore not considered here.

18 Sensor Tower, “Global Consumer Spending in Mobile Apps Reached \$133 Billion in 2021, Up Nearly 20% from 2020,” <https://sensortower.com/blog/app-revenue-and-downloads-2021>; OECD, “Exchange rates,” <https://data.oecd.org/conversion/exchange-rates.htm>.

19 Apple, “Apple Pay,” <https://www.apple.com/apple-pay/>.

20 Apple, “Countries and regions that support Apple Pay,” <https://support.apple.com/en-us/HT207957>.

Table 4 Summary of Big Tech Payments-Related Businesses

Firm	Payments Related Businesses
Apple ²¹	1) Apple ID – Over 1 billion consumers have an Apple ID, which enables users to purchase digital goods and services in Apple's ecosystem using the payment credentials they have stored with it.
	2) Apple Pay – Apple Pay is a digital wallet on iPhones which people can use to make purchases at physical POS using contactless terminals and online at accepting merchants. Available in 72 countries as of March 2022. Apple Pay was used in over 15 billion transactions based on data from 2020.
	3) Apple Cash – Apple Cash allows iPhone, Apple Watch and iPad users to send and receive money in the Messages app. Available in all countries where Apple Pay operates.
	4) Apple Card – In August 2019, Apple launched Apple Card credit card in the U.S. in partnership with Goldman Sachs.
	5) Apple Pay Later – Apple is reportedly working on is working with Goldman Sachs on a service that allows customers to pay for Apple Pay purchases in installments over time.
Google ²²	Google Pay – Google Pay is the name Google uses to refer to accounts with stored payment credentials that are used to pay in the Google Play Store which distributes Android Apps and in-app purchases as well as other Google digital goods; on Android devices for making purchases using Android phones; and for Google Chrome.
	1) Google Pay for Google Play – Google Play is a digital distribution service for Google Android Apps, which enables users to purchase digital goods and services in Google's ecosystem. There are over 3 billion active Android devices on Google Play. Consumers generally must have a Google Pay account to purchase apps and in-app content.
	2) Google Pay for Mobile Payments on Android Phones – Google Pay on Android phones enables people to make purchases at physical POS using contactless terminals. Available in 75 countries.
Amazon ²³	3) Google Pay for Chrome – Chrome users can add their Google Pay credentials to Chrome and use those credentials to pay. There are over 3 billion Google Chrome users.
	1) Amazon One-Click – Amazon users set up an account with payment credentials which is then to pay on Amazon or third-party merchants on Amazon using Amazon's one-click method. Currently, there are over 300 million active Amazon customer accounts globally.
2) Amazon Pay – Amazon Pay is a digital payment service that allows customers to make purchases on third-party websites, off of Amazon, using payment and shipping information stored in their Amazon.com account.	

21 Apple FQ1 2021 Earnings Call Transcript, January 27, 2021, transcribed by S&P Capital IQ, at p. 4; Apple FQ1 2020 Earnings Call Transcript, January 28, 2020, transcribed by S&P Capital IQ, at p. 5; Apple, "Countries and regions that support Apple Pay," <https://support.apple.com/en-us/HT207957>; Apple, "Apple Card launches today for all US customers," August 20, 2019, <https://www.apple.com/newsroom/2019/08/apple-card-launches-today-for-all-us-customers/>; Apple, "Apple Cash," <https://www.apple.com/apple-cash/>.

22 Google Pay Help, "Countries or regions where you can use Google Pay," <https://support.google.com/pay/answer/9023773?hl=en>; Tech Radar, "Google Chrome browser now has more than 3 billion users," May 26, 2021, <https://www.techradar.com/news/google-chrome-browser-now-has-more-than-3-billion-users>; The Verge, "There are over 3 billion active Android devices," May 18, 2021, <https://www.theverge.com/2021/5/18/22440813/android-devices-active-number-smartphones-google-2021>; Bloomberg, "Apple, Goldman Plan 'Buy Now, Pay Later' Service to Rival Affirm," July 13, 2021, <https://www.bloomberg.com/news/articles/2021-07-13/apple-goldman-plan-buy-now-pay-later-service-to-rival-paypal>.

23 Amazon, "How Amazon Pay works," <https://pay.amazon.com/blog/how-amazon-pay-works>; Amazon, "Sell worldwide with Amazon," <https://sell.amazon.com/global-selling>.

Firm	Payments Related Businesses
Facebook ²⁴	<p>1) Facebook Pay – Facebook Pay enables users to send money, shop, donate and more, across Facebook apps and services. Currently, Facebook Pay can be used on Instagram in several countries, is available on Messenger in Thailand and the U.S., and is available on WhatsApp in Brazil and India. Beginning in August 2021, Facebook enabled businesses in the U.S. who use participating platforms to offer Facebook Pay as a payment option directly on their websites.</p> <p>2) Diem (formerly Libra, and now closed down) – Project’s mission was “to enable a simple global payment system and financial infrastructure that empowers billions of people” by creating a global, digital system built on the foundation of blockchain technology.</p>

According to PYMNTS.com, for the US, Apple Pay is used for about 6 percent of transactions in which the consumer has Apple Pay and is at a contactless POS that can accept it; the percent of people who have Apple Pay, and use it when they can, has held roughly steady since 2015. In the US, Apple has engaged in various promotional efforts to increase usage. For example, in the U.S., Apple has offered Instacart (the leading grocery-delivery platform in the US) users \$30 off an order if they pay with Apple Pay.

Apple has also teamed with Goldman Sachs to issue the Apple Card, a credit card, which launched in the US in August 2019. Cornerstone Advisors estimates it has more than 6 million cardholders.²⁵ There are media reports that Apple plans to develop a “buy-now, pay later” (BNPL) installment credit product that could compete in this rapidly growing lending area.

Recently, Apple has shown a significant interest in expanding its financial services business. In March 2022, Apple bought Credit Kudos, a London-based FinTech that uses its access to bank data, under open banking in the UK, to provide credit scores businesses on users.²⁶ According to Bloomberg, Apple also launched a multi-year plan that would bring in-house “payment processing, risk assessment for lending, fraud analysis, credit checks, and additional customer service functions such as handling disputes.”²⁷ Although it has not announced any plans Apple could then use these integrated payment and financial capabilities to compete with other players and not just replace its own dependence on them.

2. Google

Google has developed several payment services which are now all operated under the name Google Pay and is sometimes seen as a payment button called G Pay.

When Google launched Android in 2008 it started Google Play, then called Android Marketplace, which is similar to the Apple App Store. To use the store to purchase apps and in-app content users had to establish an account and attach a payment credential. Google Play is bundled with most Android phone outside of China. In 2021, there were over 3 billion active Android devices on Google Play and it is likely that many of

²⁴ Facebook, “Streamline Checkout on Your Site with Facebook Pay,” July 14, 2021, <https://www.facebook.com/business/news/integrate-facebook-pay-directly-into-business-website>; Facebook Pay, “Current availability,” <https://pay.facebook.com/availability>; WhatsApp, “Send Payments in India with WhatsApp,” <https://blog.whatsapp.com/send-payments-in-india-with-whatsapp/?lang=en>; Diem, “White Paper v2.0,” <https://www.diem.com/en-us/white-paper/>.

²⁵ Forbes, “Apple Card Grows To 6.4 Million Cardholders Thanks To Women,” May 4, 2021, <https://www.forbes.com/sites/ronshevlin/2021/05/04/apple-card-grows-to-64-million-cardholders-thanks-to-women>.

²⁶ PYMNTS.com, “Apple Acquires Credit Kudos, UK Data Tool for Lenders,” March 23, 2022, <https://www.pymnts.com/news/digital-banking/2022/apple-acquires-credit-kudos-uk-data-tool-for-lenders/>.

²⁷ Bloomberg, “Apple Working to Bring More Financial Services In-House,” March 30, 2022, <https://www.bloomberg.com/news/articles/2022-03-30/apple-is-working-on-project-to-bring-financial-services-in-house>.

these had Google accounts with payment credentials so they could use the Google Play Store.²⁸ Consumers spent an estimated €40 billion for Android apps in Google Play Store in 2021.²⁹ Consumers can also purchase digital products, such as books, through Google Play through a web browser and people can set up Google Play accounts even if they don't have an Android phone.

In 2015, Google launched Google Pay for Android phones. Consumers register debit or credit card, from participating institutions, and use Google Pay to pay, using NFC, at participating merchants that had contactless terminals. Google Pay is available, according to Google, in 75 countries.³⁰ The same PYMNTS.com study mentioned above found that, in the U.S. in 2021, Google Pay accounted for about 0.6 percent of the value of retail transactions in 2021 (about a third of Apple Pay).

Google Pay, however, has become the largest mobile payments method in India. Mobile is a significant method of payment in India because of the low penetration of card acceptance at the physical point-of-sale and the relatively low card use. Mobile payments have also taken off as a result of creation of the Unified Payment Interface (UPI) which facilitates the movement of funds between bank accounts. Google Pay had a reported 220 million users and accounted for an estimated 37.5 percent of mobile payments in India in 2021.³¹

Google Chrome users can also store payment credentials. These are then used to auto-populate payment information at checkout although users have to enter their CVC code. There are over 3 billion Google Chrome users globally.³² Google enables Chrome users to use Google Pay as their payment credential. No data are available on how many of them have established Google accounts.

Some apps and websites have agreed to offer Google Pay – or G Pay – as a payment option for consumers.

3. Amazon

To use Amazon's pioneering "one-click" method, introduced in 1997, consumers must enter their debit or credit card details. When consumers press "Buy Now", or any other button that authorizes a purchase, Amazon charges the payment credential it has on file. Globally, Amazon had about 300 million active users in 2021.³³ It may have even more people who have registered card details with it.

Amazon Pay, launched in 2007, enables Amazon users to pay with their Amazon account on participating third-party websites off of Amazon. Consumers can also register for an Amazon Pay account even if they do not have an Amazon account. Amazon Pay is currently available in 18 countries.³⁴ Amazon says that tens of thousands of merchants accept Amazon Pay.³⁵

Amazon Pay is also integrated into Alexa, Amazon's voice-activated platform. Alexa is available on Amazon's Echo products as well as integrated in various third-party hardware such as cars, televisions and refrigerators.

28 The Verge, "There are over 3 billion active Android devices," May 18, 2021, <https://www.theverge.com/2021/5/18/22440813/android-devices-active-number-smartphones-google-2021>.

29 Sensor Tower, "Global Consumer Spending in Mobile Apps Reached \$133 Billion in 2021, Up Nearly 20% from 2020," <https://sensortower.com/blog/app-revenue-and-downloads-2021>; OECD, "Exchange rates," <https://data.oecd.org/conversion/exchange-rates.htm>.

30 Google Pay Help, "Countries or regions where you can use Google Pay," <https://support.google.com/pay/answer/9023773?hl=en>. People can use Apple Pay and Google Pay for physical POS transactions only if their banks agreed to that.

31 Inc42, "PhonePe, Google Pay Led UPI Txn With Total 83% Market Share In 2021," January 8, 2022, <https://inc42.com/buzz/phonepe-google-pay-led-upi-txn-with-total-83-market-share-in-2021/>.

32 Tech Radar, "Google Chrome browser now has more than 3 billion users," May 26, 2021, <https://www.techradar.com/news/google-chrome-browser-now-has-more-than-3-billion-users>.

33 Amazon, "Sell worldwide with Amazon," <https://sell.amazon.com/global-selling>.

34 Amazon Pay, "Choose your country or region," <https://pay.amazon.com/>; Amazon Pay, "Merchant frequently asked questions," <https://pay.amazon.com/help/201810860>.

35 Amazon Pay, "What is Amazon Pay?" https://pay.amazon.com/what-is-amazon-pay?place=cta_button&content=whatis.

In 2020 Amazon Exxon and Mobil – two large gas station chains in the U.S. – began rolling out Alexa to gas pumps so that people say “pay for gas” which are then processed using Amazon Pay.

4. Facebook

Facebook’s first foray into payments was Facebook Credits, a short-lived virtual currency which people bought with a payment credential registered with their account. Unlike Amazon, Apple, and Google, however, Facebook has not had a significant amount commerce on its properties and therefore did not attract many users for its currency.

In 2019, it launched Facebook Pay for making payments on Facebook, Instagram, and WhatsApp – for Facebook’s various commerce initiatives and P2P payments – as well as participating online merchants. Shopify, a leading Amazon competitor in the US, started accepting Facebook Pay in August 2021.³⁶ We have not found public data on the number of active users on or off Facebook.

Facebook also spearheaded a cryptocurrency initiative, called Libra in June 2019, that issued a stablecoin tied to a basket of fiat currencies.³⁷ Libra encountered objections from regulators around the world. Libra was substantially modified and relaunched as Diem. Facebook closed Diem and sold its assets in February 2022.

Facebook is reportedly exploring new efforts to create a virtual currency for its platform and for the metaverse. It is also pursuing the provision of financial services such as providing credit to small businesses.³⁸

Despite its limited success so far, with 2.9 billion monthly-active users, its continued efforts in commerce, its Facebook Pay service, and its financial services ambitions, Facebook should be counted as a serious global contender in payments.³⁹

5. Summary of Big Tech Payments

Apple, Google and Amazon are substantial global payments players. They each have what is, in effect, a digital wallet, similar to PayPal, in which consumers have entered one or more debit or credit cards or other accepted payment credentials such as direct debit. Initially, customers could use those digital wallets only to pay for goods and services sold by these companies. Each company then made it possible to use these – or additional digital wallets they introduced – on third-party sites. Apple and Google have made substantial efforts to enable their respective mobile devices – iPhones and Android phones – to pay at physical points-of-sale. Outside of China, where Google isn’t present, Apple and Google control the software on virtually every smartphone in use. Amazon has started to do so using its Alexa platform.

As of the end of 2021, although public data aren’t available, these companies probably place most transactions over debit and credit cards – most commonly MasterCard and Visa – and usually issued by banks. Just as PayPal has encouraged consumers to do direct debits, rather than using cards, these companies could move consumers to other payment methods, such as the instant payment schemes that are being offered in the EU, U.S., and other countries.

36 PYMNTS.com, “Facebook Pay Available Off Facebook, Starting With Shopify In August,” July 14, 2021, <https://www.pymnts.com/news/social-commerce/2021/facebook-heightens-digital-wallet-contest-with-0-pct-revenue-share-until-2023/>

37 Tech Crunch, “Facebook announces Libra cryptocurrency: All you need to know,” June 18, 2019, <https://techcrunch.com/2019/06/18/facebook-libra/>.

38 Hannah Murphy, “Facebook owner Meta targets finance with ‘Zuck Bucks’ and creator coin,” *Financial Times*, 6 April 2022. <https://www.ft.com/content/50f9e9ba-32c8-4caf-a34e-234031019371>

39 Facebook, “FB Earnings Presentation Q4 2021,” at p. 14, https://s21.q4cdn.com/399680738/files/doc_financials/2021/q4/Q4-2021_Earnings-Presentation-Final.pdf.

D. FinTechs

FinTechs use digital technology to provide financial services to consumers and business as well as infrastructure that other players can rely on to offer financial services.

1. FinTechs in Payments

PayPal is the oldest and largest FinTech. It began as an online payment method for consumers and merchants in 1998. Today, PayPal, largely through acquisitions, is a substantial player in many aspects of digital payments. It has a market cap of about \$136B compared to \$142B for American Express, \$356B for Mastercard, and \$475B for Visa.⁴⁰

The PayPal digital wallet has 426 million active account holders in more than 200 countries.⁴¹ These users have registered one or more payment credentials, such as credit card or direct debit details, in their accounts. More than 30 million online merchants accept PayPal and receive a variety of payment processing services from it.⁴² In many countries, PayPal is one of the leading methods for paying online. As of early 2022, PayPal was the leading digital wallet for online transactions in four of the EU-5 countries – Italy, France, Germany, Spain, and Italy as well as the United Kingdom – and almost as popular as payment cards except in Germany where it was more popular.⁴³

PayPal Credit provides consumer financing of purchases including buy-now pay later.

In 2013, PayPal bought Braintree which now is one of the largest online payment processors and gateways in the world. It also purchased iZettle, based in Stockholm, which provides mobile POS solutions for SMEs, in 2018.

Many FinTechs were launched towards the end or beginning of the last decade. A few have also grown into very large players. Stripe, for example, was founded in 2009, and has become one of largest processors of online payments globally. Online merchants can paste small amounts of code into their websites or apps provided by Stripe and then accept payments from customers using many payment types in 47 countries as of 2021. It also works proactively with digital businesses, such as Spotify, to develop customized payment solutions. It is not a public company but, as of November 2021, its market valuation was \$95 billion based on the latest round of investment.

Many FinTechs provide payments and related services. Some prominent examples for key areas include:

- **Consumer payments:** Klarna, based in Sweden, and Afterpay, based in Australia, are two of the leading “buy-now pay later” (BNPL) firms which provide installment credit.⁴⁴ They compete with credit-card issuers as a source of financing for consumer purchases.
- **Remittances:** Wise, headquartered in London, is a remittance company which facilitates cross-border person-to-person payments. It competes with traditional remittance companies such as Western Union.

⁴⁰ Market capitalizations as of April 1, 2022.

⁴¹ PayPal, “Fourth Quarter and Full Year 2021 Results,” February 1, 2022, https://s1.q4cdn.com/633035571/files/doc_financials/2021/q4/Q4-FY-21-PayPal-Earnings-Release.pdf; PayPal, “PayPal Global - All countries and markets,” <https://www.paypal.com/us/webapps/mpp/country-worldwide>.

⁴² PayPal, “PayPal Business,” <https://www.paypal.com/us/business>.

⁴³ Based on consumer surveys conducted in January and February 2022, covering more than 15,000 respondents in 11 countries. “Global Connected Economy Index,” PYMNTS.com, forthcoming April 2022.

⁴⁴ Square bought Afterpay in 2021 and has renamed the combined company Block. See Square, “Square, Inc. Announces Plans to Acquire Afterpay, Strengthening and Enabling Further Integration Between its Seller and Cash App Ecosystems,” August 1, 2021, <https://squareup.com/us/en/press/square-announces-plans-to-acquire-afterpay>.

- **Neo-banks:** Revolut, based in London, N26 based in Berlin, and Lydia based in France are neo-banks that provide digital banking services, including payments, in multiple countries. They compete with traditional banks, including in providing payment services.
- **Infrastructure:** Adyen, based in the Netherlands, specializes in providing online payment processing for websites and apps; Viva Wallet, Sumup, and MyPOS are European-based companies that enable SMEs to use mobile devices to accept payments, following in footsteps of larger players such as Square, based in the US. They compete with traditional payment processing businesses such as Worldline.

Table 5 shows the leading FinTechs based on market cap or the latest valuation.⁴⁵

Table 5 Summary of FinTech Companies with Market Caps/Valuations over \$10B⁴⁶

Company	Product Type	Location	Market Capitalization/ Latest Valuation (Billions USD)
PayPal	Consumer payments/ payment processing	San Jose, U.S.	\$136
Stripe	Processors/ infrastructure	San Francisco, U.S.	\$95
Block (merger of Square and Afterpay)	Consumer payments	San Francisco, U.S.	\$77
Adyen	Processors/ infrastructure	Amsterdam, Netherlands	\$61
Klarna	Consumer payments	Stockholm, Sweden	\$46
Checkout.com	Consumer payments	London, UK	\$40
Nubank	Neo-bank	São Paulo, Brazil	\$37
Revolut	Neo-bank	London, UK	\$33
Rapyd	Consumer payments	London, UK	\$15
Affirm	Consumer payments	San Francisco, U.S.	\$13

Sources: S&P Capital IQ; Bloomberg; Reuters; Calcalist.

Notes: Market capitalization and valuations are as of April 1, 2022. In August 2021, Square announced plans to acquire Afterpay.

2. Growth in FinTechs

There has been massive growth in FinTechs, particularly since 2008, as more entrepreneurs have started businesses and venture capital money has poured in. The formation rate of FinTechs in the UK and EU has accelerated recently because of “open banking” initiatives implemented in January 2018, under separate legislation in the UK and under PSD2 in the EU. The initiatives require banks to make customer depository

⁴⁵ Note that market caps of FinTechs have declined substantially since November 2021. Since the valuations of the private companies are based on most recent funding rounds they are not directly comparable since they may not reflect the increase in valuations that occurred during the pandemic or the recent decline.

⁴⁶ S&P Capital IQ; Bloomberg, “N26 Eyes Value of About \$10 Billion in Fresh Fundraising,” July 14, 2021, <https://www.bloomberg.com/news/articles/2021-07-14/n26-said-to-eye-value-of-about-10-billion-in-fresh-fundraising>; TechCrunch, “Checkout.com raises \$1B round at \$40B valuation,” January 12, 2022, <https://techcrunch.com/2022/01/12/checkout-com-raises-1b-round-at-40b-valuation/>; Reuters, “Payments firm Klarna’s valuation rises to \$46 billion after fundraising,” June 10, 2021, <https://www.reuters.com/business/payments-firm-klarnas-valuation-rises-46-billion-after-fundraising-2021-06-10/>; Calcalist, “Rapyd reaches \$15 billion valuation, becomes Israel’s highest valued unicorn,” March 13, 2022, <https://www.calcalistech.com/ctechnews/article/rkyicgswc>; Square, “Square, Inc. Announces Plans to Acquire Afterpay, Strengthening and Enabling Further Integration Between its Seller and Cash App Ecosystems,” August 1, 2021, <https://squareup.com/us/en/press/square-announces-plans-to-acquire-afterpay>.

account data available through an API.⁴⁷ FinTechs can then access these data, when given permission by account holders, and build value-added products and services based on them.

Between 2018 and the first half of 2021, European FinTechs raised €33.4 billion.⁴⁸ This substantial investment in FinTechs has enabled these firms to sustain large losses for many years while they seek market traction. For example, N26 lost €216.9 million in 2019,⁴⁹ Revolut lost £167.8 million in 2020, up from £106.7 million lost in 2019,⁵⁰ and Klarna posted a \$344 million loss in the first three quarters of 2021, quadrupling over the same period the year prior.⁵¹

Table 6 shows the top 20 FinTechs in the UK/Europe; it includes several of the companies in the previous table.

Table 6 Top FinTech Companies in Europe

Organization Name	Valuation in billions of Euros	Country	Primary Category
Adyen	€ 55	Netherlands	Payments
Klarna	€ 54	Sweden	Credit/BNPL
Checkout.com	€ 36	United Kingdom	Payments
Revolut	€ 30	United Kingdom	Neo-bank
Rapyd	€ 14	United Kingdom	Payments
N26	€ 8	Germany	Neo-bank
Eurazeo	€ 6	France	Neo-bank
Mollie	€ 6	Netherlands	Payments
Wise	€ 6	United Kingdom	Payments
Mambu	€ 5	Germany	Cloud computing
Trade Republic	€ 5	Germany	Neo-bank
Qonto	€ 5	France	Neo-bank
OakNorth	€ 5	United Kingdom	Cloud computing
Zepz	€ 5	United Kingdom	Payments
Monzo	€ 4	United Kingdom	Neo-bank
Starling Bank	€ 3	United Kingdom	Neo-bank
BGL Group	€ 3	United Kingdom	Insurance
Wefox	€ 3	Germany	Insurance
TradingView	€ 3	United Kingdom	Data analytics
Paysafe	€ 2	United Kingdom	Payments

Note Valuations based on most recent data as of April 1, 2022.

47 An Advanced Programming Interface (API) is software that can access services and data provided for other software. A Fintech can include a bank-supplied API in its software to obtain data for customers that have provided the proper permissions to do so.

48 Isabel Woodford, "2021 has (already!) been a record year for European fintech investment," Sifted, June 16, 2021, <https://sifted.eu/articles/european-fintech-record-2021/>.

49 Ryan Browne, "Fintech firm N26 is now worth more than Germany's second-largest bank," CNBC, October 18, 2021, <https://www.cnbc.com/2021/10/18/n26-triples-valuation-to-9-billion-now-worth-more-than-commerzbank.html>.

50 Ryan Browne, "\$5.5 billion fintech firm Revolut's losses mounted in 2020 but crypto gave it a big boost," CNBC, June 21, 2021, <https://www.cnbc.com/2021/06/21/revolut-2020-annual-results.html>.

51 Ryan Browne, "\$46 billion fintech Klarna sees losses quadruple amid surging demand for buy now, pay later," CNBC, November 26, 2021, <https://www.cnbc.com/2021/11/26/klarna-losses-quadruple-amid-huge-demand-for-buy-now-pay-later.html>.

As is typical for successful digital businesses, many of these companies are providing services in multiple countries. To illustrate this point Table 7 list the EU countries in which the following FinTechs provide services: N26 (banking services), Lydia (person-person payments and banking), Wise (remittances), and Klarna (BNPL and similar consumer payment offerings).

Table 7 EU countries Served by Leading FinTech Companies⁵²

Company	EU Countries with Operations
N26	Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden
Lydia	Belgium, France, Germany, Ireland, Italy, Luxembourg, Portugal, Spain
Wise	All EU countries
Klarna	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden

They are likely to expand more over time. As noted above PayPal started in 1998 but is now available in over 200 countries while Stripe, started in 2009, is now available in 47.

3. FinTechs and Traditional Players

Traditional global payments companies have also moved aggressively into FinTech through investments and acquisitions.

Mastercard and Visa have both purchased leading players. In June 2020, Mastercard bought Fincity, which operates an open banking platform connecting more than 10,000 financial institutions mainly in the U.S., for about €723 million.⁵³ It also bought Aiiia, which connects to over 2,900 banks and financial institutions in Europe in September 2021.⁵⁴

In 2020, Visa tried to buy Plaid, which operates the largest open banking platform in the U.S., but ran into regulatory objections, and dropped the deal.⁵⁵ Visa bought Tink, a Swedish-based open banking platform which connects more than 3400 banks and financial institutions, for €1.8 billion, in March 2022 following regulatory approvals.⁵⁶ Tink operates in 18 markets in Europe.⁵⁷ Lydia, for example, uses Tink to access bank accounts in Europe.

Traditional global payments companies have also moved aggressively into FinTech through investments and acquisitions.

52 N26, "Can I open an N26 account in my country?," <https://support.n26.com/en-at/account-and-personal-details/opening-an-account/can-i-open-an-n26-account-in-my-country/>; Lydia, "List of compatible countries within the Lydia app," <https://support.lydia-app.com/1/en/article/lcu8v7dbca-which-countries-are-eligible>; Wise, "Guide to EUR transfers," <https://wise.com/help/articles/2932149/guide-to-eur-transfers>; Klarna, "In which countries can I use Klarna?," <https://www.klarna.com/us/business/merchant-support/in-which-countries-can-i-use-klarna/>.

53 Fincity, "Mastercard to Acquire Fincity to Advance Open Banking Strategy," June 23, 2020, <https://www.fincity.com/mastercard-to-acquire-fincity-to-advance-open-banking-strategy/>; OECD, "Exchange rates," <https://data.oecd.org/conversion/exchange-rates.htm>.

54 Mastercard Newsroom, "Mastercard expands open banking reach with acquisition of Aiiia," September 7, 2021, <https://www.mastercard.com/news/press/2021/september/mastercard-expands-open-banking-reach-with-acquisition-of-aiia/>; Aiiia, "Open banking that simply works," <https://www.aiia.eu/>.

55 U.S. Department of Justice, "Visa and Plaid Abandon Merger After Antitrust Division's Suit to Block," January 12, 2021, <https://www.justice.gov/opa/pr/visa-and-plaid-abandon-merger-after-antitrust-division-s-suit-block>.

56 Reuters, "Visa to buy Swedish fintech Tink for \$2.2 billion," June 24, 2021, <https://www.reuters.com/business/visa-buy-european-open-banking-platform-tink-215-billion-2021-06-24/>.

57 Tink, "About Us," <https://tink.com/about-us/>.

These acquisitions position Mastercard and Visa to serve as trusted intermediaries for banks and FinTechs. Mastercard, for example, recently launched a BNPL platform for FinTechs as well as traditional players, which provides BNPL capability at 78 million merchant POS, relying on its Finicity platform to provide access to bank accounts.

Other traditional players have also invested in FinTech businesses. In the early 2000s Chase Merchant Services (part of JP Morgan Chase) and First Data (now part of Fiserv) joined forces to create Chase Paymentech which focused on processing online card transactions. It became one of the largest online processors and today, as a subsidiary of JPMorgan Chase, competes with Stripe, Braintree, Adyen and other pure-play FinTechs. French-based Worldline also developed a substantial online processing business in the early 2000s and remains a leading player.

Banco Santander, based in Spain, which is one of the largest banking and financial services firms in the world, founded PagoNxt, a FinTech. PagoNxt provides payment solutions for merchants, consumers, and corporates, operating in the Eurozone as well as Latin America and the U.S. J.P. Morgan Chase, which is the largest retail bank in the U.S., is launching a digital-only bank in the UK, and thereby competing with other neo-bank and traditional banks there.

Traditional payment processors have consolidated in the last couple of years. These acquisitions have enabled them to improve their multi-channel – that is physical, mobile, and online – offerings. They have also extended their geographic reach. That is of particular importance for online payment processing because online businesses want to be able to accept payments in many countries. In late 2020, Worldline purchased Ingenico, for example, making the combined company the largest payments firm in Europe. During the same period, Nexi, an Italian bank and payments processor, acquired Nets, a Danish FinTech, after merging with Sia, an Italian competitor.⁵⁸ Nexi Group describes itself as “The European PayTech” which “is now present in more than 25 countries, representing 65% overall European consumption.”⁵⁹

E. Instant Payments and Account-to-Account

Consumers have come to expect that things will happen almost instantly for them when they use the internet. Spurred by this, central banks and other payment regulators have pushed banks to develop payment “rails” that can move money between payments accounts instantly too. As of 2021, about 56 countries had developed real-time payment (“RTP”) rails that can move money between accounts in real time.⁶⁰ Banks have invested in the technology to create and use these rails. In the U.S., for example, an association of large banks (The Clearing House) launched its RTP network in 2017; the Federal Reserve Board will launch its FedNow RTP network in 2023. Countries are working towards making these RTP networks interoperable – including significant efforts in the European Union with SEPA Instant Credit Transfer – thereby facilitating the rapid movement of funds cross-border. As of 2021, 60 percent of PSPs are fully interoperable and SEPA Instant Credit accounted for over 10 percent of all transfers.⁶¹

58 Financial Times, “How the private equity industry stole a march in European payments,” November 19, 2020, <https://www.ft.com/content/e5756da3-e040-4f41-9849-9bfd17a8a69>.

59 Nexi, “About us,” <https://www.nexi.it/en/about-us.html>

60 McKinsey & Company, “Global payments 2021: Transformation amid turbulent undercurrents,” October 7, 2021, <https://www.mckinsey.com/industries/financial-services/our-insights/global-payments-2021-transformation-amid-turbulent-undercurrents>.

61 European Payments Council, “SEPA Instant Credit Transfer,” <https://www.europeanpaymentscouncil.eu/what-we-do/sepa-instant-credit-transfer>.

Before RTP rails, consumers and businesses in these countries would encounter lags – hours and in some cases days – to send and receive funds domestically and even longer internationally. With RTP rails they can choose to transfer funds immediately and irrevocably. Banks are building various payment products and services that benefit from these instant features.

Central banks, and other payments regulators, see RTP rails as source of competition for payment card networks and a way to reduce the cost of consumer-to-business transactions. The United Kingdom, for example, has a strategy for using the instant-payment rails to reduce the portion of transactions made with cards and, in their view, thereby reduce costs for the economy.⁶² The EU is pursuing similar initiatives based on SEPA Instant Credit as discussed below.

Previous efforts to persuade consumers and merchants to shift from cards often relied on the relatively slow and inefficient methods for moving money between accounts. By relying on fast, efficient RTP rails, new networks might have better success in providing solutions that would appeal to enough merchants and consumers to ignite an alternative to payment card networks. As RTP rails become interoperable across countries, it will become easier to develop payment networks for retail transactions that are more global and can thereby compete with Mastercard and Visa.

The growth of FinTechs, and open banking initiatives, also increase the likelihood that account-to-account networks based on RTP rails will lead to innovative and disruptive payment solutions. FinTechs are increasingly persuading consumers to give them access to their payment accounts at banks. They could use that access, together with the RTP rails, to create a critical mass of consumers which would then help them sign up merchants for a cheaper alternative to domestic and international payment card schemes.



 The growth of FinTechs, and open banking initiatives, also increase the likelihood that account-to-account networks based on RTP rails will lead to innovative and disruptive payment solutions.



F. Blockchain and Crypto

Many new entities are trying to build payments and financial services solutions using a distributed ledger technology known as the blockchain and these entities are typically distinguished from FinTechs. The blockchain authenticates and records transactions on a decentralized network that spans multiple computers. Transactions take place using a cryptocurrency which are stored on the blockchain and rely on cryptographic methods for security.

Blockchains can be designed so that they are public, in which case anyone can host the ledger and process transactions, or private, in which case a central party gives permissions to participate. Public blockchains are often associated with the cryptocurrency they use. Bitcoin therefore refers to the bitcoin cryptocurrency, which people can store securely, and the particular public distributed ledger used for bitcoin. The market cap of cryptocurrencies is more than \$2T as of April 1, 2022. Whether that reflects real durable value, or a speculative bubble that will pop, is a matter of debate.

62 PYMNTS.com, “UK’s Payment Strategy Focuses on Fraud Detection, Instant Payments,” March 10, 2022, <https://www.pymnts.com/news/international/2022/united-kingdom-payment-strategy-focuses-fraud-detection-instant-payments/>.

So far, public blockchains have not become significant payment systems which was their original purpose.⁶³ They face the same chicken and egg problem as other payment methods – no one wants to use a currency that few take. More fundamentally though, the original design of public blockchains based on Bitcoin couldn't provide a currency with a stable value, which is essential for people to want to use it for payments. The design also limited the speed and throughput of the blockchain; the Bitcoin blockchain can't process more than 7 transactions per second compared to 65,000 per second for the Visa network.⁶⁴ Private blockchains do not have these limitations.

El Salvador, population 6.5 million, has used U.S. dollars as its national currency. On September 9, 2021, the government also made Bitcoin a national currency. Bitcoin is legal tender that everyone has to accept for payment. In advance of the launch, the government developed infrastructure including a digital wallet for storing and using Bitcoin and ATMs that could be used to redeem bitcoin for dollars. It is too soon to know whether Bitcoin can compete with the dollar or with cash. So far, the experiment has not gone well.⁶⁵

Nevertheless, there is a massive amount of investment in public and private blockchains and in applications based on this technology. There are efforts to address the stability and scalability problems as well as ones to develop applications that rely on the blockchain. Ethereum, and some of the other blockchains, have pioneered “smart contracts” which can provide the foundation for various applications in trade, finance, and payments. These are software-based contracts stored on the blockchain that execute actions when certain conditions are met such as insurance contracts for farmers based on observed rainfall.

This technology is still at a very early stage. The following examples show, however, that blockchain and crypto related technologies could result in disruptive innovative and increase dynamic competition in payments.

Central banks are considering issuing Central Bank Digital Currencies (CBDC). These could provide the basis for payments and other financial services that could disrupt traditional and new payments players including crypto. The People's Bank of China launched a digital yuan in early 2021. It works with existing mobile digital wallets such as Alipay but can also be used directly with bank apps to pay merchants. The ECB is looking at issuing a CBDC as is the U.S. Federal Reserve Board. Some of these initiatives envision, as possibilities, the central bank playing a more significant role in operating retail payments systems, and in some cases hosting payments accounts. As with RTP rails, CBDC could power new payment networks that could challenge payments and financial service offerings from traditional banks and card schemes.

A number of traditional payments players are pursuing innovations using private blockchains. Onyx, a division of J. P. Morgan launched Liink which “enables financial institutions and corporate users to make secure, peer-to-peer data transfers with greater speed and control.” Liink is a potential competitor to SWIFT for exchanging payments and settlement data between banks.⁶⁶ Onyx is pursuing other applications of blockchain technology to financial services.

63 The most successful “use cases” involve payments related to criminal activities and exchanges for buying and selling crypto as investments or, some would say, for speculation.

64 Evans, David S. (2022) “Can Crypto Fix Itself in Time?”, CPI TechREG Chronicle, February 2022, available at <https://ssrn.com/abstract=4031977>.

65 The Washington Post, “Nayib Bukele trades bitcoin naked. El Salvador is paying the price,” January 26, 2022. <https://www.washingtonpost.com/world/2022/01/26/el-salvador-bitcoin-dip-crypto-crash/>.

66 Financial Times, “How blockchain is shaking Swift and the global payments system,” July 29, 2021, <https://www.ft.com/content/91342189-978f-4d44-9dcf-b993983f08f9>.

Decentralized Finance (DeFi) is a controversial application of blockchain technology. A typical DeFi network is peer-to-peer, has no intermediaries, and is governed, aside from the underlying software, if at all, by its participants through voting rights. The network relies on “stablecoins” that are typically pegged to a fiat currency or a basket of fiat currencies for transactions. The network supports apps which can be designed, including through the use of programmable contracts, to provide various financial services. Nuo Network, for example, enables people to borrow and lend cryptocurrencies. People can use the network to lend their cryptocurrencies in return for interest; borrowers can use the cryptocurrencies to speculate or they can turn them into fiat currencies and make investments, such as buying a house or starting a business.

Cryptocurrencies, and financial services that rely on it, are largely unregulated in most countries. Central banks and other regulators are looking into regulation and China has made transactions, based on private crypto, illegal.⁶⁷ There is also concern that cryptocurrencies are subject to a speculative bubble that will not end well. Others view crypto as the future internet of money with enormous potential as the foundation of the, as yet ill-defined, Web 3 and the metaverse.⁶⁸

G. An Overview of the EU Regulation for Payments and Digital Businesses

EU regulators will play an important role in the evolution of payments during the digital transformation in Europe.

The European Union has focused on payments as part of its long-term mission to create a single market. The big bang for these initiatives was the launch of the euro in 1999 and the introduction of euro note bills and coins in participating countries in 2002.

The European Commission, European Parliament, the European Central Bank have played significant roles in devising interventions, including regulations, for the payments industry to help achieve, in their views, increased integration and efficiency. They have also backed various initiatives to create an EU-alternative to the global card networks.

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More recently, the European Union has adopted a number of regulatory initiatives for the digital economy. The Digital Markets Act will soon become law, following final agreements between EU Parliament and the Council, and it is widely expected that the, the Digital Services Act will become EU law in 2022.

67 For a survey of some of the issues see Duffie, Darrell, Raghuram Rajan, Kenneth Rogoff, Hyun Song Shinn, and Working Group Digital G30 on Currencies. 2020. “Digital Currencies and Stablecoins: Risks, Opportunities and Challenges Ahead”.

68 The New York Times, “Welcome to ‘Web3.’ What’s That?,” December 5, 2021, <https://www.nytimes.com/2021/12/05/business/dealbook/what-is-web3.html>.

1. Multilateral Interchange Fee Regulation

For a number of years the European Commission focused on regulation of the interchange fees that card schemes require merchant acquirers to pay card issuers on their networks. DG-Comp launched an investigation of Mastercard and Visa in the 2000s. Visa agreed to reduce its fees in December 2010 to settle the matter while the Commission reached a decision against Mastercard in 2007 which was ultimately upheld by the European Court of Justice. These resulted in caps on interchange fees for cross-border transactions for these international card networks.

Meanwhile the Commission pursued legislation that would regulate interchange fees. These efforts resulted in the MIF Regulation adopted in April 2015 which imposed ceilings on interchange fees for consumer debit and credit cards for both cross-border and domestic card transactions. The legislation led to a substantial drop in interchange fees paid by acquirers and received by issues.⁶⁹ Some of the reduction was passed on to merchants and some of what was passed to merchants was passed on to consumers.⁷⁰

These regulations, and the related decisions under competition policy, limit the ability of domestic and international card networks to adopt a particular pricing model under which merchants pay issuers for access to cardholders which leads issuers to incent cardholders to join.

2. Payments Services Directive 2 and Open Banking

The European Union enacted the first Payments Services Directive (PSD) in 2007 which created rules for which organizations could provide payment services in the EU and business-conduct rules for these organizations. PSD2, which was adopted in November 2015, and came into force in January 2018, was a significant update to this directive.

The key new provision of PSD2 involves a requirement that banks open their payment services and account data to Third Party Payment Services Providers (TPPs) – what we referred to as open banking above. TPPs can initiate payments on behalf of a consumer from her bank account without redirecting the consumer to the bank’s portal. TPPs can also get access to the consumer’s bank account and information related to it. As discussed earlier, unlike the open-banking framework adopted in the UK, PSD2 does not mandate a uniform structure for TPPs and banks to interact with each other.

Under PSD2 it is not possible for banks to charge TPPs or current account holders any additional fees for providing the required services and information required by regulation, which in Portugal include a large array of domestic payment solutions.

3. EU-Led Initiatives to Develop Card Alternatives

The European Union, through multiple institutions, has promoted the development of “account-to-account” payment rails – through direct debit or credit transfers – as an alternative to card networks. These initiatives were stimulated by concerns over the dominance of Visa and Mastercard in Europe as well as over claimed market distortions from interchange fees, although the MIF Regulations have largely addressed that issue.

69 European Commission, “Report on the application of Regulation (EU) 2015/751 on interchange fees for cardbased payment transactions,” June 29, 2020 at pp. 5-6, Figure 7, https://ec.europa.eu/competition/sectors/financial_services/IFR_report_card_payment.pdf

70 European Commission, “Report on the application of Regulation (EU) 2015/751 on interchange fees for cardbased payment transactions,” June 29, 2020 at pp. 5-6, https://ec.europa.eu/competition/sectors/financial_services/IFR_report_card_payment.pdf

The ECB and EC have sought help from the European Payments Council (EPC). The EPC was established in 2002 to help with developing SEPA and include most major financial institutions and payments service providers in the EU. It consists of 77 payments service providers, or national associations of payment service providers, across the EEA.

During the 2010s a number of member states developed “instant payments” networks which enable the real-time transfer of funds, at any time, which the recipient can use immediately. Concerned that these networks would not be interoperable, EU institutions (including the ECB), in the context of wider SEPA single payments area stimulation, mandated the EPC to develop a pan-European scheme rules, known as the SEPA Credit Transfer (SCT) Inst scheme which became into force as an optional scheme in 2017. The ECB also launched a SEPA SCT INST processing infrastructure, called TIPS in 2018, which enables participating financial institutions to send and receive instant payment transactions in euros across the EU.

Neo-banks and FinTechs and other players can use the SCT Inst rails as a building block to develop and deploy pan-European value-added services. A neo-bank, like a traditional bank, can use SCT Inst to transfer funds between its payments accounts and accounts at traditional banks or other neo-banks. As a result of open banking, a FinTech can rely on APIs at customer banks to initiate an SCT Inst transfer of funds.

The EPC was also encouraged to develop SEPA Request-to-Pay (SRTP) for account-to-account transactions. RTP provides messaging functionality, embodied in a set of operating rules the technical elements, that enable a payee to request payment from a payer, for various physical or online use cases.⁷¹ The ECB and the European Retail Payments Board (ERPB) are encouraging the broader adoption and use of SRTP across Europe.

The ECB and EC also appear to be supporting the “European Payments Initiative” (EPI), a banking industry-led project to develop a pan-European payments network that could launch as multi-purpose card that could compete with Visa and Mastercard for cardholders and merchants. At this stage, EPI refers to itself as an “interim company.” It has 31 founding partners consisting mainly of large banks, including Deutsche Bank and Santander, as well as global payment processing, technology providers and acquirers, such as Worldline and NETS; it does not currently have any domestic Portuguese banks.

It remains to be seen whether enough members will invest in EPI and whether it will succeed in launching a pan-European payment solution. EPI is best seen as an example of how entrepreneurs can leverage SCT Inst rails, and other efforts to progress SEPA. Whether EPI succeeds or fails, others can use these rails to develop narrowly-focused payment solutions, such as cross-border remittances, or broader ones, focused on widespread merchant acceptance.

Much further off in the distance it is possible that the ECB will introduce a CBDC which could provide another set of payment rails based on the real-time movement of digital currency. It is currently investigating the possibility of a digital euro.⁷²

71 European Payments Council, “The SEPA Request-to-Pay (SRTP) Scheme,” <https://www.europeanpaymentscouncil.eu/what-we-do/other-schemes/sepa-request-pay-scheme>

72 European Central Bank, “Eurosystem launches digital euro project,” July 14, 2021, <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210714~d99198ea23.en.html>.

4. Digital Regulation

The European Union has been a leader in developing regulatory frameworks for the digital economy which have been influential globally.

The first major legislation was the General Data Protection Regulation (GDPR) on data protection and privacy. It was adopted in 2016 and came into force in 2018. GDPR involved a revision of the 1998 Data Protection Act. It imposes strong requirements that make companies accountable for protecting people's rights to their data and privacy, including making them subject to fines. Amazon, for example, was levied a €746 million fine in 2021 for engaging targeted advertising without proper consumer permissions.

The Digital Markets Act (DMA) will become law imminently following an agreement on March 24, 2022 between the European Parliament and the European Council on its final language. It is designed to create a level playing field for digital competition. It tries to do so through regulation of digital “gatekeepers” that provide core platform services to consumers and businesses. Core services include online marketplaces/app stores, search engines, social networks, video-sharing, operating systems, cloud, communications, ad networks affiliated with services, browsers, virtual assistances, and connected TVs. There are specific criteria for determining who qualifies as a gatekeeper but at a minimum the BigTech firms are all gatekeepers.

A summary prepared by the European Council says that designated gatekeepers will have to⁷³

- ensure that users have the right to unsubscribe from core platform services under similar conditions to subscription;
- for the most important software (e.g. web browsers), not require this software by default upon installation of the operating system;
- ensure the interoperability of their instant messaging services' basic functionalities;
- allow app developers fair access to the supplementary functionalities of smartphones (e.g. NFC chip);
- give sellers access to their marketing or advertising performance data on the platform; and
- inform the European Commission of their acquisitions and mergers

Gatekeepers can no longer:

- rank their own products or services higher than those of others (self-preferencing);
- reuse private data collected during a service for the purposes of another service;
- establish unfair conditions for business users;
- pre-install certain software applications; and,
- require app developers to use certain services (e.g. payment systems or identity providers) in order to be listed in app stores

The legislation provides for fines of up to 10 percent of global turnover, up to 20 percent for a repeat offense, and the possibility of breaking Gatekeepers up for repeated non-compliance.

73 European Council of the European Union, “Digital Markets Act (DMA): agreement between the Council and the European Parliament,” Maruch 25, 2022, <https://www.consilium.europa.eu/en/press/press-releases/2022/03/25/council-and-european-parliament-reach-agreement-on-the-digital-markets-act/>.

The Digital Services Act (DSA) was initially approved by EU Parliament in January 2022.⁷⁴ It is designed to protect the fundamental rights of users online, and has three main requirements:

1. It requires platforms to remove illegal products, services, and content “without undue delay” on receipt of notice. Online marketplaces must make sure consumers can purchase safe products with stronger “Know Your Business Customer” principles.
2. Platforms have to provide consumers who don’t give consent for using data other options to use the platform.
3. “Very Large Online Platforms” (VLOPS) (more than 45 million users) have specific obligations regarding dissemination of illegal and harmful content, and must provide at least one recommender system that isn’t based on profiles.

The DSA awaits a final vote by EU Parliament and the European Council before it is enacted into law, which is expected sometime in 2022, and could be modified as a result of further negotiation between Parliament and the Council.

The DMA and DSA are not specifically targeted to payments as a core service of payments companies as gatekeepers. Along with GDPR, however, the new laws limit digital platforms from using data in ways that could harm consumers or provide an unfair competitive advantage. They also limit designated gatekeepers for preferencing their own payment methods. That could lead to material changes in the payments services provided by Apple and Google and potentially Amazon and Facebook.

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 The DMA and DSA are not specifically targeted to payments as a core service of payments companies as gatekeepers. Along with GDPR, however, the new laws aim at limiting digital platforms from the use of data in ways that could harm consumers or to provide an unfair competitive advantage.
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⁷⁴ European Parliament, “Digital Services Act: regulating platforms for a safer online space for users,” January 20, 2022, <https://www.europarl.europa.eu/news/en/press-room/20220114IPR21017/digital-services-act-regulating-platforms-for-a-safer-online-space-for-users>.



The Digital Transformation and Payments in Portugal



Portugal is fertile ground for the digital transformation.

Most people have access to the internet from fixed broadband connections, using their computers and browsers, or smartphones with a data plan from their cellular carriers. Most also have payment cards, and payment accounts, that enable them to engage in transactions on websites and apps, to use digital wallets, and pay with their smartphones.

Looking backward, this chapter shows that Portugal has benefitted from a robust and innovative payments system largely driven by domestic players. This now helps global players, such as Apple, introduce new payment products, which depend on people having payment cards, merchants taking cards, and processors handling card transactions.

Looking forward, this chapter shows that global firms, many of which have already entered Portugal, will play increasingly important roles in driving competition and innovation alongside domestic ones. That is largely just a reflection of the new realities, particularly in Europe, that make it easier to operate payments businesses globally and make national borders much less relevant.

Part A describes the current state of how people pay in Portugal, including innovative domestic solutions, and how Portugal compares to other EU countries. Part B shows that BigTech and FinTech firms, along with other multinational ones, have entered Portugal and are working to expand their footprints in the country as well as internationally.

A. Payments and Innovation in Portugal

To understand payments and innovation in Portugal, it is useful to start by briefly outlining the key players.⁷⁵

Since its creation in 1983, SIBS has played a key role in developing the infrastructure for the Portuguese payments industry and driving innovation in retail payments. Historically, from a consumer standpoint, SIBS has operated the ATM network for 27 banks which account for almost all consumer bank deposits and, under the MB brand, the domestic debit card scheme.

⁷⁵ An appendix describes the structure of the payments industry in more detail.

Starting around 2015 SIBS introduced MB WAY, which is a mobile app that enables payment account holders at participating banks to pay with a QR code at participant merchants, transfer money to other MB WAY participants, buy online by generating a proxy or virtual card number, along with other services.

From a merchant standpoint, SIBS enables merchants to accept cards on compatible EFTPOS terminals and online. It is also the processor for all these transactions including settling with merchants and banks.

SIBS was founded by Portuguese banks who sought scale economies in a small market from developing a shared platform and is now owned by 21 banks.⁷⁶ It now operates in several countries, including Poland and Romania.

Portuguese banks are critical players in payments in Portugal as they are in most developed countries. They offer consumers payment accounts, which is where most people put their paychecks and manage their household finances, operate ATM machines, issue debit cards which access those funds, and often issue credit cards as well. Banks also offer online banking, and mobile banking. An estimated 64 percent of internet users used online banking in 2021.⁷⁷

Most major banks in Portugal belong to Mastercard and/or Visa for issuing credit cards.⁷⁸ Banks issue credit cards that provide credit functionality through the international schemes. Often the credit cards also enable MB thereby providing the consumer with both credit and debit functionality.

1. All the Ways People Can Pay

There are two main dimensions to how people can pay which help in understanding data on how they do pay in Portugal.

The first is where the money comes from. Payment methods transfer money from the consumer to the merchant.

The simplest case is cash. The money comes from the consumer and probably from a wallet. The consumer obtained that cash from an ATM machine, over the counter at their branch, perhaps because they were paid in cash, from a stash at home, or from a family or friend.

Debit cards and direct debit, including MB WAY's P2P option, and credit transfers pull the money from the consumer's payment account at their bank.

Credit cards pull money in the first instance from the card issuer, typically a bank. The issuer sends the money through the card network to the merchant and later bills the consumer who has options to pay in full or revolve.

Some digital payment methods, often called e-money – enable the consumer to download money, effectively, into the payment method, such as the Starbucks mobile app, so that it is there for the taking. In some cases,

76 Rosa Soares, "Business model, the secret of MULTIBANCO," *Publico*, 30 September 2007. <https://www.publico.pt/2007/09/30/jornal/modelo-de-negocio-o-segredo-do-multibanco-231725>

77 Eurostat, "Individuals - internet use," https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_ifp_iu/default/table?lang=en; Eurostat, "Individuals using the internet for internet banking," <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>.

78 China Union Pay is also present and Discover is making inroads in acquiring and is expected to issue cards as well.

the money is automatically pulled from another account. The money then comes from the issuer of the e-money method who the consumer already paid or provided access to funds.

The second dimension involves the physical mechanism by which the consumer effectively gives the merchant the money.

At physical locations, consumers give the merchant cash, insert a plastic card into, or wave at, an EFTPOS, or use a mobile phone for which the consumer has registered a payment credential, such as a credit card or current account details, into an app, such as Apple Pay. Figure 2 shows the stickers on a smoothie stand in Lisbon which lists the various methods accepted for payment at the store's EFTPOSs. The stand lets consumers know that they can pay with MB, the major international card brands, Apple Pay and G Pay.

Figure 2 Payment Methods Accepted at Vendor Shop Window in Lisbon

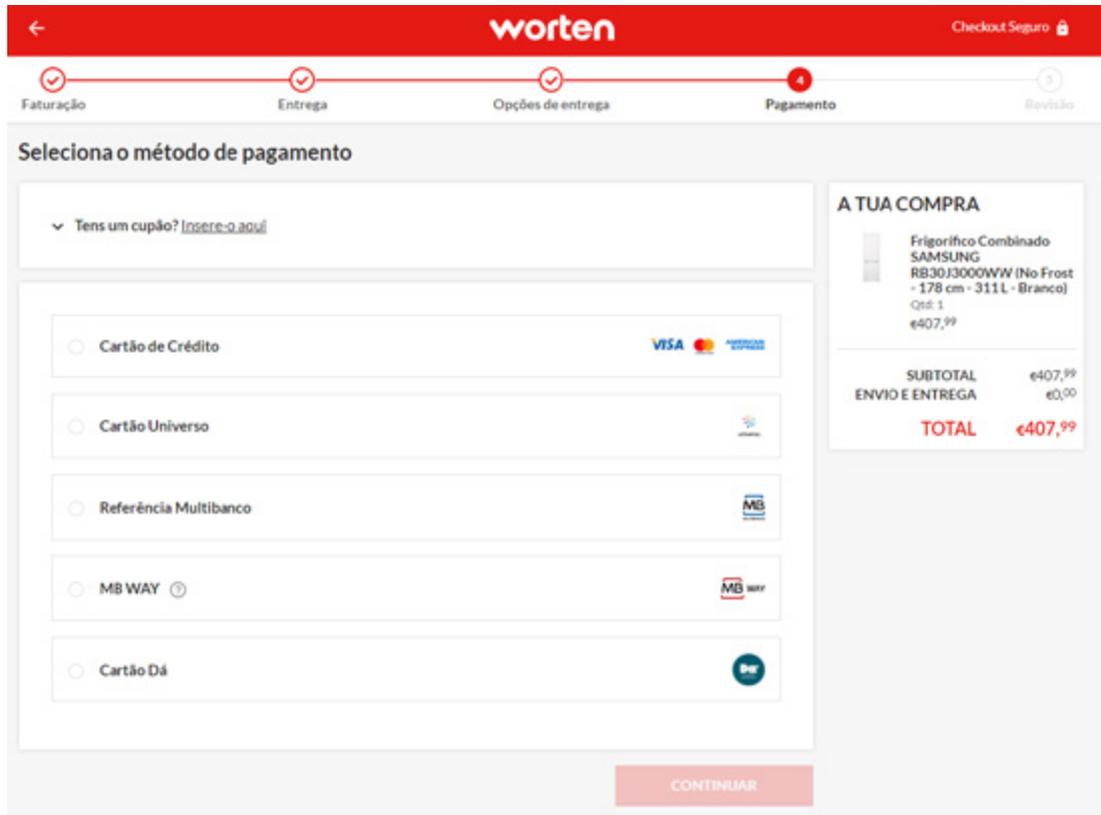


Online, for websites, consumers can typically pay with a card number – their actual card number or a virtual one (generated in the MB WAY app, for example) or a digital wallet (such as PayPal) into which they have registered a card credential. Figures 3 and 4 show the check-out page at a typical Portuguese online store, Worten, which is the largest appliance retailer, and El Corte Ingles, the largest department store in Europe, which also caters to an international clientele.

Figure 3 Check-Out Page at El Corte Inglés



Figure 4 Check-Out Page at Worten



For Apple's iOS and Google's Android, payments in app often depend on whether the goods and services being sold are physical or digital. For physical goods, such as a ride, consumers can normally pay with the same options they have for websites; this is determined by the app, Uber for example, which payment options users can register in a country. For digital goods, such as an artifact for a game, or a digital subscription, consumers typically have to use the app store's payment method based on a payment credential the user has registered with Apple or Google, as discussed above.

Finally, Portuguese consumers can use their ATM/debit card to access an ATM, or use their mobile banking app or site, to authorize payment from their current account. That can also be used to pay at an online site that generates an invoice.

2. How People Pay in Portugal

Unfortunately, as in many countries, there are no comprehensive data on the payment methods, and sources of funds, that people use to pay overall in Portugal.⁷⁹ The following presentation looks at various elements of how people pay.

The general portrait that emerges is that, as of around 2020, cards were the leading method for paying in physical stores and online; consumers pay bills and online purchases with direct debits; and cash accounts for a substantial portion of payments at physical stores. Mobile payment methods are used increasingly – both at physical stores and online – and the use of virtual cards online is rising.

The following statistical portrait of payments relies on two main sources.

ECB's Payments and Settlement Systems Statistics (PSSS) collects payments data in most EU countries, including Portugal. It publishes these data in its statistical warehouse. They are commonly used to measure payments in the EU. The most recent data available are for 2020.

The SPACE survey, sponsored by the ECB, collected data from 17 EU countries between mid-March and mid-December 2019 on various aspects of consumer payments. Respondents were asked to keep track of their payment transactions in one-day diaries. The SPACE survey also used payment diaries collected during 2017 and 2019 by Germany and the Netherlands. That resulted in data for 19 countries for similar questions asked in these surveys. These are the EU-19 countries identified above. The SPACE survey included Portugal for which there were 2,127 respondents.

When these sources provide conflicting results, we use discretion in choosing which to report. The SPACE data provide useful indications of payments behaviors that are not tracked otherwise. Respondents, however, do not necessarily understand some of the questions and may not record accurate data, such as the amount they paid.

The ECB Statistical Warehouse data is likely accurate at least for countries with sophisticated financial institutions that track data. The data refers to crude payment categories, however, and does not track mobile payment methods such as MB WAY or Apple Pay.

⁷⁹ The same is true in many countries although occasional surveys sometime provide more comprehensive (although self-reported) data.

a. Cash vs. Cards

To calculate the share of payments made with cash versus cards it is necessary to estimate the amount of cash use. Although systematic data on the use of cash pay is not available it can be inferred from the amount of cash that people take out annually.⁸⁰ People mainly get cash from ATM machines and bank branches both of which are reported by the ECB's PSSS as are card payments.⁸¹ These data are likely highly accurate and are available consistently across most countries. In 2020, payments made with cash accounted for 32 percent of household consumption expenditures in Portugal and, of all payments made with cards or cash, 34 percent.⁸² Of course, the percent of cash is higher at physical locations and nil at online ones.

As of 2020, 21.9 million payment cards had been issued in Portugal.⁸³ That works out to about 2.1 cards per capita or 2.4 per citizen aged 15 or older.⁸⁴ According to published data, about 95 percent of those cards had a debit and/or delayed debit function.⁸⁵ In 2020, debit cards accounted for 96 percent of card transactions compared to 4 percent for credit cards.⁸⁶

These data do not, however, capture the fact that many debit cards are co-badged with a credit card brand. These dual-function cards enable the cardholder to pay using debit, through MB, or to pay using credit, through their credit card issuer. Of the roughly 22 million cards with some payment schemes about 31 percent are dual-purpose which enable them to be used as credit cards.⁸⁷

b. Physical Points of Sale

Many retailers have EFTPOSs that can accept cards and other forms of digital payments. As of September 2021, 173,614 merchants had physical and/or digital acceptance through the MULTIBANCO network.⁸⁸ There were 354.6 thousand payment terminals in Portugal as of December 2020 compared to approximately 131 thousand retail establishments.⁸⁹ The SPACE survey reports that 71 percent of POSs made it possible for

80 Colgan, Gloria, David Evans, Scott Murray, and Karen Webster (2013) "Paying with Cash: A Multi-Country Analysis of the Past and Future of the Use of Cash for Payments by Consumers," Working Paper.

81 The SPACE survey also asks people where they get cash from including from ATMs. See European Central Bank (2020) "Study on the payment attitudes of consumers in the euro area (SPACE)" at Chart 59. We have also used the percent for 2017 for ATM use to infer the total amount of cash use based on PSSS data on ATM cash withdrawals. The cash percent for 2020 based on this approach is 33 percent compared to 34 percent based on assuming cash is obtain either from ATMs or over-the-counter.

82 Calculations based on data from the European Central Bank. See the following data series: "All cash transactions: Via customer terminals provided by non-resident PSPs - cash withdrawals", "All cash transactions - Via customer terminals provided by non-resident PSPs - cash withdrawals", "OTC cash withdrawals", and "Final consumption expenditure of households by consumption purpose". The SPACE survey reports that cash accounted for 54 percent of the value of POS and P2P transactions in 2019. One possibility for the difference is that it is based on people reporting the value of transactions and will understate card use if people don't report large value transactions which are typically made on cards. See European Central Bank (2020) "Study on the payment attitudes of consumers in the euro area (SPACE)" at Figure 1.

83 European Central Bank (2021) "Payments Statistics Full Report," at Table 10.1 Number of cards issued by resident PSPs, <https://sdw.ecb.europa.eu/reports.do?node=1000004051>.

84 The World Bank, "Population, total - Portugal" <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=PT>; The World Bank, "Population ages 0-14, total - Portugal," <https://data.worldbank.org/indicator/SP.POP.0014.TO?locations=PT>.

85 European Central Bank (2021) "Payments Statistics Full Report," at Table 10.1 Number of cards issued by resident PSPs, <https://sdw.ecb.europa.eu/reports.do?node=1000004051>. The ECB notes, "If a card offers several functions, it is counted in each applicable sub-category. Thus the total number of cards may be smaller than the sum of the sub-categories, and sub-categories should not be added up in order to avoid double-counting." See European Central Bank (2021) "Payments Statistics Full Report: Payments statistics: methodological Notes" at p. 2, <https://sdw.ecb.europa.eu/reports.do?node=1000002018>.

86 Calculations based on data from European Central Bank's Payments and Settlement Systems Statistics, and The World Bank, World Development Indicators

87 European Central Bank (2021) "Payments Statistics Full Report," at Table 10.1 Number of cards issued by resident PSPs, <https://sdw.ecb.europa.eu/reports.do?node=1000004051>.

88 Data provided by SIBS.

89 European Central Bank, "Number of POS terminals provided by resident PSPs - located in the reporting country - from Portugal," https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_publicacoes&PUBLICACOESpub_boui=133604&PUBLICACOES modo=2&xlang=pt.

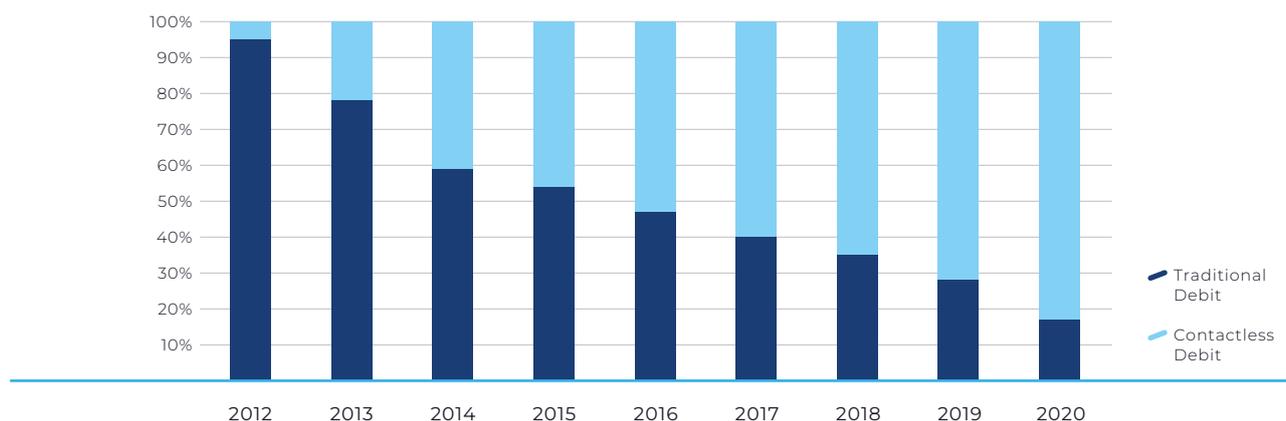
consumers to pay with cards or other non-cash payment methods and therefore had EFTPOSs. The 29 percent of POSs that only accepted cash are likely small merchants.

Around 95 percent of the EFTPOS terminals could take contactless payments from a domestic scheme, such as MB and about 59 percent from an international scheme such as a Visa debit card or Apple Pay. By 2020, 83 percent of debit cards in Portugal were contactless compared to just 22 percent in 2013. Figure 5 documents the move to contactless cards.

Contactless EFTPOS terminals are capable of taking Apple Pay, Google Pay, and other digital wallets that use NFC to communicate with the terminal. MB WAY can be used with both iOS and Android phones to pay with a QR code, or the latter only at contactless terminals with NFC. MB WAY cannot be used with iPhones to pay at contactless terminals because Apple does not allow payment apps to gain access to the “secure element” necessary for that.⁹⁰

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The use of SIBS' mobile payment method, MB WAY, has grown rapidly at physical stores, particularly for low-valued transactions.
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Figure 5 Percent of Debit Cards in Portugal that are Traditional vs Contactless, 2012-2020



Source: SIBS

Despite the high penetration of contactless cards and terminals in Portugal, only 24 percent of transactions (23 percent based on value) were made with contactless with the remainder done by inserting the card in the terminal according to the SPACE survey for 2019.⁹¹ According to the Banco de Portugal, that share has increased to more than 40 percent of transactions as of December 2021.⁹²

⁹⁰ Apple's refusal to allow competitors of Apple Pay access to the secure element has been the subject of several antitrust investigations. See European Commission, “Antitrust: Commission opens investigation into Apple practices regarding Apple Pay,” June 16, 2020, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1075; Reuters, “French watchdog warns of big tech's sway over payment services,” April 29, 2021, <https://www.reuters.com/technology/french-watchdog-warns-big-techs-sway-over-payment-services-2021-04-29/>. The Australian government is currently considering new laws that would regulate digital wallets, including Apple Pay. See Reuters, “Australia considering new laws for Apple, Google, WeChat digital wallets,” August 30, 2021, <https://www.reuters.com/technology/australia-considering-new-laws-apple-google-wechat-digital-wallets-2021-08-30/>.

⁹¹ European Central Bank, “Study on the payment attitudes of consumers in the euro area (SPACE)” at Charts 8 and 9.

⁹² “Banco de Portugal: 40% of card payments were already ‘contactless’ at the end of 2021,” *Expresso*, 23 February 2022. <https://expresso.pt/economia/2022-02-23-banco-de-portugal-40-dos-pagamentos-com-cartao-ja-eram-contactless-no-final-de-2021>

Public data are not available on the use of mobile payments at EFTPOSs. SIBS reports that MB WAY has grown rapidly since its introduction in 2015 and it, along with Apple Pay, are increasingly used by Portuguese consumers.

c. Online Points-of-Purchase

In 2019, according to the SPACE survey, and shown in Table 8, 61 percent of the online transactions by value, and 38 percent by number, were made with cards. E-payment solutions, which include Pagamento de Serviços, accounted for 25 percent, by value, and 46 percent by number.

Table 8 Share of Payment Instruments for Online Transactions, Portugal

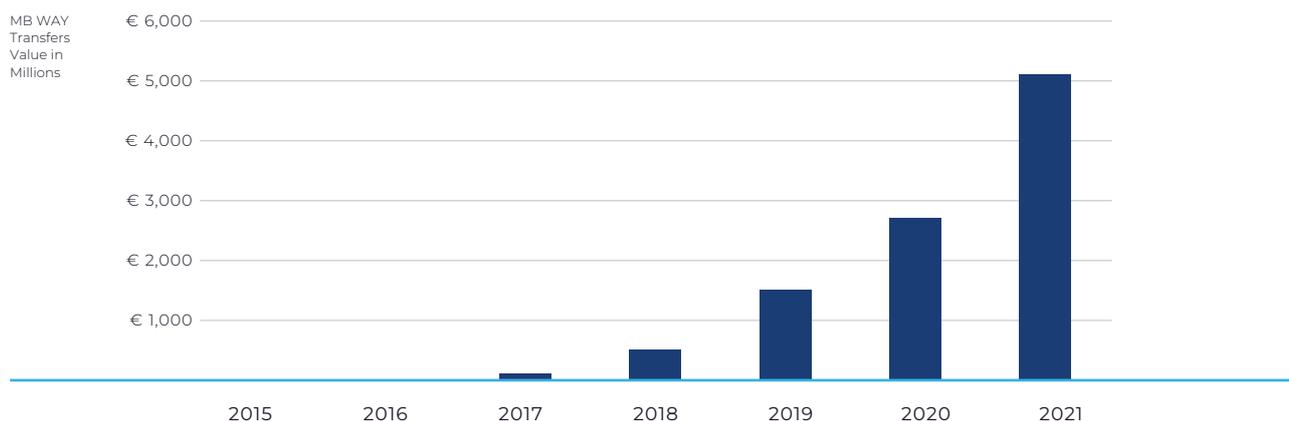
Instrument	Share of Transactions	Share of Transaction Value
Card	38%	61%
Cash	4%	2%
Credit Transfer	7%	8%
E-Payment Solutions	46%	25%
Other	4%	4%

Source: European Central Bank (2020) “Study on the payment attitudes of consumers in the euro area (SPACE),” at Charts 15-16.

At the same time, there is evidence to suggest that more transactions in the digital world are moving to MB WAY and digital wallets such as PayPal.

People also send money to each other online. MB WAY was used to do that for an increasing amount, as shown in Figure 8, surpassing €5 billion in 2021. Some of the P2P payments may also be for personal services such as a babysitter.

Figure 8 Value of MB WAY Transfers, 2015-2021



Source: SIBS

The SPACE report also reports how people make bill payments based on number. In 2019, 35 percent of bill payments were made with cards, 29 percent with direct debit, and 6 percent with other methods.⁹³ The SPACE survey finds that 16 percent of bill payments were made with cash.

d. ATMs

Portugal had 14,415 ATMs in 2021 according to data from the Portuguese Bank Association. The density of that network is reflected in the fact that the average number of ATMs per 1000 people is 1.4. ATMs are the major source of cash in Portugal as we saw above.

MULTIBANCO provides a number of services at its ATMs besides withdrawing cash. Consumers can pay their bills, top-up and charge their mobile phones, get a train ticket, and transfer funds between accounts at participating banks. As of September 2021, there were 24 million MULTIBANCO cards which provided ATM access.⁹⁴ Table 9 shows the number of different transactions conducted in 2021. Only 52 percent of the transactions at the ATMs involved cash withdrawal, which confirms the diverse ways that Portuguese consumers use these ATMs.

Metric	Inquiry	Withdrawal	Service Payment & Special Services	Others
Number	190,321,852	353,981,032	86,829,954	55,231,674
Share of Total	27.73%	51.57%	12.65%	8.05%

Source: SIBS. Others include Deposit, transfers, and various Value Added operations

Based on value, withdrawals amounted to €27.8 billion, payment services/special services €9.1 billion, deposits €8.1 billion, transfers €16.2 billion. Payment services refer to the functionality that covers multiple entities receiving payments in the “entity/reference” standard. Cash withdrawals only comprised about 45 percent of the value of transactions, further confirming the diverse use of ATMs in Portugal.

3. Portugal Compared to Other EU Countries⁹⁵

Portugal has a remarkably robust and innovative payment system given its relative size and per capita income.

As of 2020, Portugal had 10.3 million people,⁹⁶ with GDP per capita of €19,646.⁹⁷ Household consumption expenditure per capita was €12,594.⁹⁸ Compared to the EU-19. Portugal ranks 8th in population, 11th in household consumption per capita, and 14th in GDP per capita.

Portugal has the densest network of ATMs in Europe. There are 1.4 ATMs per 1000 inhabitants – compared with 0.85 for the EU-5 and 0.83 for the EU-19 in 2021. And those ATMs provide a much richer menu of services as discussed above than ATMs in other countries. This network provided highly innovative way of providing

Portugal has a remarkably robust and innovative payment system given its relative size and per capita income.

⁹⁴ Based on data from SIBS.

⁹⁵ All European averages are population weighted.

⁹⁶ The World Bank, “Population, total - Portugal,” <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=PT>.

⁹⁷ The World Bank, “Population, total - Portugal,” <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=PT>; The World Bank, “GDP (current US\$),” <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>; OECD, “Exchange rates,” <https://data.oecd.org/conversion/exchange-rates.htm>.

⁹⁸ The World Bank, “Population, total,” <https://data.worldbank.org/indicator/SP.POP.TOTL>; The World Bank, “GDP (current US\$),” <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>; The World Bank, “Households and NPISHs final consumption expenditure (% of GDP) - Portugal,” <https://data.worldbank.org/indicator/NE.CON.PRVT.ZS?locations=PT>; ; OECD, “Exchange rates,” <https://data.oecd.org/conversion/exchange-rates.htm>.

remote payment services to the population, including those without internet access, and when online banking was more primitive than it is today.

Portugal also has one of the densest networks of EFTPOSs in Europe. With 36.5 terminals per 1000 inhabitants, it ranks fifth in the EU-27 in 2021.⁹⁹ That enables people with cards, or smartphone apps, to pay digitally at many physical merchants.

In 2021, roughly 95 percent of people over the age of 15 have debit cards in Portugal which is slightly higher than the average for the EU5 at 97 percent. These debit cards provide access to ATMs and EFTPOSs not to mention online methods discussed below. Counting both debit and credit, the number of cards per capita is 2.2, the third highest in the EU-27.¹⁰⁰

With MB WAY, Portugal has also been a leader in the adoption of a widely accepted domestic mobile payments methods. While there is little data on the availability of mobile payment solutions by country, it does not appear that the EU-5 or the UK have a mobile payments method that is widely accepted at physical points of sale, supported by major domestic or international card networks, and with a large base of users. Apple Pay and Google Pay are the main mobile payment apps used in most countries although there are some smaller domestic schemes such as PayBack Pay in Germany. It also does not appear that virtual card solutions, similar to MB NET, are in use in major EU countries or the UK.

Portugal has made good progress in reducing the use of cash which provides an overall reflection of the impact of innovations in payments. We calculated the share of cash relative to household expenditures following the methodology described above for the EU-5 and twelve EU countries for which consistent data were available. Table 10 reports the cash share for 2020 and the percent decline in the cash share between 2014 and 2020. Portugal has a higher cash share than the EU-5 or EU-16 average, but its rate of decline has been substantially greater. As of 2020 its cash share was lower than Italy and was 7th out the 16 countries for which we had data.

Portugal has made good progress in reducing the use of cash which provides an overall reflection of the impact of innovations in payments.

Table 10 Share of Household Consumption Expenditures Accounted for by Cash Payments

Metric	Portugal	EU-5	EU-16
Share in 2020	32%	25%	26%
Percentage Point Change Since 2014	-15%	-6%	-8%

Source: Calculations based on data from European Central Bank's Payments and Settlement Systems Statistics.

Note: Due to unavailability of data, EU-19 estimates exclude Austria, Finland and Malta for all years and Estonia and Luxembourg in 2014.

Portugal has achieved wide adoption of contactless terminals although it has lagged in issuing contactless cards. In 2020, according to the SPACE survey, Portuguese respondents indicated that they used contactless for 23 percent of all transactions by value.¹⁰¹ That compares to an average for of 29 percent for the EU-5 and

⁹⁹ Data is unavailable for Cyprus and Malta.

¹⁰⁰ Data is unavailable for Cyprus and Malta.

¹⁰¹ European Central Bank (2020) "Study on the payment attitudes of consumers in the euro area (SPACE)," Chart 9.

31 percent for the EU-19.¹⁰² Portuguese consumers used contactless less in than all EU-19 countries except France, Belgium, and Germany. MB is rolling out more contactless cards rapidly which will close these gaps and, as noted above, contactless had increased to over 40 percent in Portugal as of December 2021.¹⁰³

The Portuguese payment system has relative low fraud rates which makes cards more reliable for consumers and merchants. In 2019, the number of fraudulent transactions per thousand transactions was 9 per 100,000 transactions in Portugal compared with 36 for the EU-5 and 32 for the EU-19.¹⁰⁴

Finally, Portugal has made significant progress towards open banking, which will prove important for the discussion below. According to a recent report by Salt Edge, which evaluates the progress towards interoperability with banks, Portugal has one of the highest availability of API solutions.¹⁰⁵ Their study examined the extent to which API requests for services sent to banks that had made APIs available “were accepted by the banks’ APIs and successfully replied to.” In 2022, 96.5 percent of API requests were successful in Portugal which placed it second among European countries (the Czech Republic was first) and third including the UK.

4. The Role of SIBS in Portuguese Payments Innovation

SIBS has been the main driver of payments innovation in Portugal. It has been mainly responsible for developing the ATM network and the deployment of EFTPOSs in Portugal. That has resulted in the dense penetration of ATMs and EFTPOSs documented above. SIBS has also been responsible for developing and operating the card network in Portugal, which has facilitated the widespread adoption of electronic payments.

SIBS has spearheaded innovations throughout the payments ecosystem. As the operator of the main ATM network, it has introduced a series of features over the years that have enabled Portuguese consumers to engage in diverse transactions. In addition to bill payments, discussed above, SIBS has introduced other value-added services.

To name a few, in 1991 it introduced a toll collection system, Via Verde, which automatically debits tolls for roads and bridges from the user’s payments account. A few years later in 1997, it created the first ATM-top up for prepaid mobile services, making Portugal the first country to have this. It then introduced self-service top up of mass transit monthly passes at the ATM. In 2008, SIBS, on behalf of the National Forestry Authority, developed ATM functionality that enable people to obtain or renew a hunting license; the program won the Prize for the best online European Administrative Service in 2009. As a result of these and similar efforts, according to a 2017 report by the Centre for European Policy Studies, “ATMs in Portugal are among the most advanced in Europe....”¹⁰⁶

SIBS has also introduced significant innovations in mobile and online payment methods. It launched MB WAY, a popular mobile payment method, in 2015, three years before Apple Pay entered. It enables payment account holders at participating banks to:

102 The EU-19 estimate excludes Cyprus and Malta due to data availability. See European Central Bank (2020) “Study on the payment attitudes of consumers in the euro area (SPACE),” Chart 9; The World Bank.

103 One source of the delay is that, unlike chip and pin there are no international standards for contactless which requires domestic schemes, such as MB, to develop their own solutions.

104 European Central Bank (2021) “Seventh report on card Fraud,” at Table 2.

105 Salt Edge (2021) “State of open banking payments in Europe in 2021,” https://www.saltedge.com/resources/others/state_of_ob_payments.

106 Willem Pieter de Groen, Zachary Kilhoffer, and Roberto Musmeci, “The Future of EU ATM Markets,” Centre for European Policy Studies,” p. 46. https://www.ceps.eu/wp-content/uploads/2018/10/20181005_FutureofATM_0.pdf.

- Transfer money to other MB WAY participants using their mobile phone number. That is, MB WAY is a mobile-based P2P payment network.
- Pay in store at participating establishments by scanning a QR Code that is displayed by the MULTIBANCO network on EFTPOS or virtual terminals.
- Buy online by introducing a mobile proxy for the MB WAY-enabled merchant and authenticating the transaction in the mobile app, or by using MB NET to generate a virtual card number from international brands.
- Withdraw cash by generating a code from the app and entering it into the MULTIBANCO ATM terminal.

SIBS also launched MB NET. It generates a virtual card which consumers can use to pay securely online. It is based on an app for Windows, iOS, and Android. Consumers register a credit or debit card in the app. They can then generate a virtual card – that is a one-time card number – that allows them to make a purchase at domestic and international stores that accept Mastercard, Visa, or American Express.

As noted above, SIBS is also a processor and automated clearing house for account-to-account transactions, under the SEPA schemes, thereby providing connectivity to the European payment system – in all of SEPA scheme modalities. In particular, SIBS' SEPA Instant Payments Solution allows banks to make available to their customers account-to-account transfers of up to €100,000 and delivered within seconds, all across Europe as it provides interoperability through TIPS.¹⁰⁷

SIBS operates a market in which payment service providers, including banks and SIBS, can provide APIs which other parties, such as FinTechs, can use under the EU's open banking initiative. SIBS API Market is used by 25 API providers. SIBS enables several APIs from account information to payment initiation and funds confirmation. SIBS API Market processed 137 million API calls in 2021 allowing over 60 registered third-party providers from 19 countries to build services with a single connection to the whole Portuguese market.¹⁰⁸

B. The Emerging Role of Big Techs, FinTechs, and Pan-European Players in Portuguese Payments

The digital transformation, the growing importance of BigTechs and FinTechs, and SEPA-related developments are introducing new competition and sources of innovation into the Portuguese payment system. Many of these sources are still in their early days but have the prospect of becoming significant factors in the payments ecosystem, and competitive dynamics, over time.

The new modes of competition have been facilitated by the investments that the Portuguese payment industry have made in the retail payments industry. SIBS has developed the key infrastructure, including the card processing, instant payment processing, and open API platforms that financial institutions, issuers, acquirers, payment providers, payment facilitators, integrators,



 The new modes of competition have been facilitated by the investments that the Portuguese payment industry have made in the retail payments industry.



¹⁰⁷ SIBS, "Payments on Account," <https://www.sibs.com/en/produtos/payments-on-account/>.

¹⁰⁸ Data provided by SIBS.

merchants, and others use to develop services. Banks and merchants have made investments that resulted in the widespread availability and use of electronic payments.

Tech firms, for example, can count on consumers having debit cards that they can enter into the firms' digital wallets, and all online merchants and most significant physical merchants accepting these cards. Apple Pay, for example, had to sign up banks to include debit cards in its wallet but could depend on almost everyone with an iPhone having a debit card and the majority of merchants with contactless EFTPOS systems being able to take it.

FinTechs can also rely on the fact that almost all households have banks accounts and that these accounts are accessible with permission through reliable bank APIs that are disseminated on the API Marketplace. They can also rely on banks participating in interoperable instant payment systems.

Lastly, despite the small size of the country, multinational processors, equipment providers, and other payments companies coming into Portugal can depend on an advanced widely deployed digital payments industry.

1. Big Techs Have a Material Presence in Payments in Portugal

Apple, Google, and Amazon are already active payments players in Portugal while Facebook is increasingly active. Table 11 provides a summary based on available data of the number of relevant users in Portugal and the key products that are present in the market.

Table 11 Summary of Big Tech Companies' Payments Related Products in Portugal

Company	Payments Related Products in Portugal	Userbase in Portugal
Apple	Apple Pay, Apple Cash, Apple ID (App Store)	1.8 million iPhone users ¹⁰⁹
Google	Google Pay for Google Play, mobile payments on Android devices, and Chrome	5.4 million Android smartphone users ¹¹⁰
Amazon	Amazon One-Click, Amazon Pay	Not available
Facebook	Facebook Pay	7.9 million Facebook users (not including Instagram or Whatsapp) ¹¹¹

a. Apple

Apple Pay launched in Portugal in June 2019. It initially partnered with 3 neo-banks – Monese, N26, and Revolut, and later Lydia – and is currently partnered with 26 banks, which accounted for approximately 70 percent of consumer deposits in Portugal, as of December 2020.¹¹² It has not partnered yet with two large banks – Banco BPI and Novo Banco. Table 12 shows the participating institutions.

¹⁰⁹ There are an estimated 7.2 million smartphone users in Portugal and iPhones account for approximately 25% of the installed base of smartphones. See Telecompaper, "Portugal reaches over 84% smartphone penetration," <https://www.telecompaper.com/news/portugal-reaches-over-84-smartphone-penetration--1366923>; Statcounter, "Mobile Operating System Market Share Portugal," <https://gs.statcounter.com/os-market-share/mobile/portugal/#monthly-202101-202109>.

¹¹⁰ There are an estimated 7.2 million smartphone users in Portugal and iPhones account for approximately 75% of the installed base of smartphones. See Telecompaper, "Portugal reaches over 84% smartphone penetration," <https://www.telecompaper.com/news/portugal-reaches-over-84-smartphone-penetration--1366923>; Statcounter, "Mobile Operating System Market Share Portugal," <https://gs.statcounter.com/os-market-share/mobile/portugal/#monthly-202101-202109>.

¹¹¹ Statista, "Facebook users in Portugal from September 2018 to July 2021," <https://www.statista.com/statistics/1017409/facebook-users-portugal/>.

¹¹² Apple, "Apple Pay participating banks in Europe and the Middle East," as rendered on June 28, 2019, <https://web.archive.org/web/20190628203002/https://support.apple.com/en-us/HT206637>; Apple, "Apple Pay participating banks in Europe and the Middle East," <https://support.apple.com/en-us/HT206637>.

Table 12 Apple Pay Participating Banks in Portugal as of March 2022¹¹³

Activo Bank	moey!
Banco Montepio	Monese
Bank of America	N26
Bunq	Openbank
Caixa Geral de Depósitos	Payhawk
Cetelem	Paysera
CGD	Revolut
Credito Agricola	Santander
Curve	SumUp
FNAC (CaixaBank Payments & Consumer)	Unibanco
iCard	Universo
Lydia	Wise
Millennium BCP	ZEN.COM

There are an estimated 1.8 million iPhone users in Portugal¹¹⁴ of whom an estimated 98 percent have an iPhone 6 or higher model than can use Apple Pay.¹¹⁵ They can use Apple Pay at any contactless terminal, about 59 percent as reported above, that accept the international cards brands. Although there are relatively fewer iPhone than Android phone users in Portugal, iPhones are expensive phones that tend to be purchased by higher-income, and therefore higher-spending, people. There are no data available for Portugal on how many iPhone users have associated a payment credential with Apple Pay.

Based on the U.S. experience it is likely that the volume of Apple Pay transactions will increase substantially as a result of more users installing Apple Pay, more banks working with Apple, and more merchants accepting it. Apple may struggle as it has in the U.S. to get iPhone users to pay with Apple Pay when they can although as noted above it is making efforts to do so by providing incentives.

Apple Pay can also be used online. A 2020 survey by ACEPI found that Apple Pay was listed as a preferred payment option for online purchases by 12 percent of respondents versus 68 percent for cards, 55 percent for PayPal, and 50 percent for MB WAY.¹¹⁶ That is an impressive showing given that Apple Pay was only became available, and only for some banks, in mid 2019.

b. Google Pay

Google has a significant presence in Portugal generally. Android phones, which generally come with Google's leading apps, account for approximately 75 percent of smartphones as of 2021.¹¹⁷ Google Chrome accounted for approximately 70 percent of browsers used by consumers in Portugal during 2020.¹¹⁸

113 Apple, "Apple Pay participating banks in Europe and the Middle East," <https://support.apple.com/en-us/HT206637>.

114 There are an estimated 7.2 million smartphone users in Portugal and iPhones account for approximately 25% of the installed base of smartphones. See Telecompaper, "Portugal reaches over 84% smartphone penetration," <https://www.telecompaper.com/news/portugal-reaches-over-84-smartphone-penetration--1366923>; Statcounter, "Mobile Operating System Market Share Portugal," <https://gs.statcounter.com/os-market-share/mobile/portugal/#monthly-202101-202109>.

115 Based on iPhone web usage worldwide during 2020 Q3. See Device Atlas, "The most popular iPhones – 2020," December 3, 2020, <https://deviceatlas.com/blog/most-popular-iphones>.

116 Associação da Economia Digital (2020) "Economia Digital em Portugal Edição 2020," at Figura 28.

117 Statcounter, "Mobile Operating System Market Share Portugal," <https://gs.statcounter.com/os-market-share/mobile/portugal/#monthly-202101-202109>.

118 Statcounter, "Browser Market Share Portugal Jan - Sept 2021," <https://gs.statcounter.com/browser-market-share/all/portugal/#monthly-202101-202109>.

As a mobile payment method, Google Pay recently entered Portugal in November 2020. At the time of entry it partnered only with FinTechs/neo-banks. Table 13 list the current set of Google Pay participating banks. Google Pay works at contactless EFTPOS if the user has an Android phone with NFC capability. There is no data available on the extent to which merchants take Google Pay yet.

Table 13 Google Pay Participating Banks in Portugal as of March 2022¹¹⁹

BitPanda	Monese	UNICRE
Bunq	N26	Universo
Caixa Geral de Depositos	Openbank	Viva Wallet
Curve OS Ltd	PayrNet	Wise
iCard	Paysafe Financial Services Limited	ZEN.COM
Lydia	Revolut	
Millennium bcp and ActivoBank	Swan	

c. Amazon

Amazon has the second-largest online store in Portugal (counting amazon.com and amazon.es) after El Cortés Ingles, the large Madrid-based department store which operates elcorteingles.pt.¹²⁰ Amazon made its Amazon Prime membership program, which now accounts for most U.S. users, available in Portugal in May 2021. Amazon, however, does not have warehouses in Portugal, and did not provide a Portuguese-language version of amazon.es until February 2021. Consumers therefore order from the Spanish store, which provides free delivery in Portugal, or the U.S. store.

Amazon's online customers in Portugal use its one-click method relying on the card credential that are also used for Amazon Pay. There is not data on Portuguese online stores taking payment with Amazon Pay. Portuguese Amazon users, however, may have this option when they shop at online stores outside of Portugal that take Amazon Pay.

d. Facebook

Facebook is widely used in Portugal with an estimated 7.9 million users in a population of 10.3 million.¹²¹ That does not include Messenger, Instagram and WhatsApp.

Facebook Pay is available in Portugal.¹²² Facebook users can use it on the social network to pay shop, buy tickets, purchases games, and make donations. Currently, people in Portugal cannot use Facebook Pay on Messenger to send and receive money.

119 Google Pay Help, "Portugal: Supported payment methods," <https://support.google.com/pay/answer/10173491?hl=en>.

120 Statista, "Most popular online stores in Portugal in 2020, by e-commerce net sales," <https://www.statista.com/forecasts/988481/top-online-stores-portugal-ecommercedb>.

121 Statista, "Facebook users in Portugal from September 2018 to July 2021," <https://www.statista.com/statistics/1017409/facebook-users-portugal/>.

122 Facebook Pay, "Current availability," <https://pay.facebook.com/availability>.

2. FinTech/Neo-Banks are Increasing Presence in Portugal

We have already seen that FinTechs, including neo-banks, are operating in Portugal. Portuguese users of Apple Pay and Google Pay can use debit and credit cards from a number of FinTechs mainly based in the EU and UK. That means that those entities serve Portuguese consumers and that if Portuguese consumers want to use Apple Pay or Google Pay they can turn to a FinTech. Viva Wallet enables merchants to accept cards on Android devices. It also operates a payments gateway for online merchants. Table 14 lists all of the FinTechs that Apple Pay and Google Pay work within Portugal and the location of their headquarters.

Table 14 FinTechs/Neo-Banks That Apple Pay and Google Pay Work within Portugal¹²³

Company	Owned by Traditional Bank	Headquarters
BitPanda	N/A	Austria
Bunq	N/A	Netherlands
Curve OS Ltd	N/A	United Kingdom
iCard	N/A	Bulgaria
Lydia	N/A	France
moeY!	CCAM	Portugal
Monese	N/A	United Kingdom
N26	N/A	Germany
Openbank	Banco Santander, S.A.	Spain
Payhawk	N/A	United Kingdom
PayrNet	N/A	United Kingdom
Paysafe	N/A	United Kingdom
Paysera	N/A	Lithuania
Reolut	N/A	United Kingdom
SumUp	N/A	United Kingdom
Universo	N/A	Portugal
Viva Wallet	N/A	Greece
Wise	N/A	United Kingdom
ZEN.COM	N/A	Poland

In addition, a diverse group of FinTechs are providing various payments and remittance services, for consumers and merchants, in Portugal. Table 15 is based on the Portuguese FinTech Report for 2020 and 2021 which list the top FinTechs; we have added others that we know to be operating in Portugal. Of the 24 firms, 14 are based in Portugal, 22 in the EU, and 2 in the UK. Of these firms, 12 provide payments and remittance services for consumers, 4 provide digital gateways for online stores, and 3 offer merchant POS services. Besides these firms there is PayPal which, as we saw above, is one the most popular online payment methods.

123 Apple, "Apple Pay participating banks in Africa, Europe, and the Middle East," <https://support.apple.com/en-us/HT206637>; Google Play Help, "Portugal: Supported payment methods," <https://support.google.com/pay/answer/10173491?hl=en>.

Table 15 New FinTechs/Neo-Banks that Provide Various Payment and Remittance Services in Portugal

Name	Headquarters	Owned by Traditional Bank	Consumer Payments and Remittances Services	Digital Gateways for Online Stores	Merchant POS Services
Ebury	United Kingdom	Banco Santander, S.A.	Yes	No	No
Lydia	France	N/A	Yes	No	No
Viva Wallet	Greece	N/A	No	Yes	Yes
EasyPay	Portugal	N/A	Yes*	No	No
FeedZai	Portugal	N/A	No	No	No
Hapi	Portugal	N/A	No	No	No
IfThenPay	Portugal	N/A	No	Yes	No
Invoicexpress	Portugal	N/A	No	No	No
Switch	Portugal	N/A	No	Yes	Yes
Revolut	United Kingdom	N/A	Yes	Yes	Yes
Best Bank	Portugal	Novo Banco, S.A.	Yes	No	No
Banco BiG	Portugal	N/A	Yes	No	No
ActivoBank	Portugal	Millennium bcp	Yes	No	No
Moey!	Portugal	CCAM	Yes	No	No
Bunq	Netherlands	N/A	Yes	No	No
N26	Germany	N/A	Yes	No	No
Openbank	Spain	Banco Santander, S.A.	Yes	No	No
Coverflex	Portugal	N/A	No	No	No
Arcopay	Spain	N/A	Yes	No	No
Tink	Sweden	N/A	No	No	No
Fraudio	Netherlands	N/A	No	No	No
YooniK	Portugal	N/A	No	No	No
Swood	Portugal	N/A	No	No	No
YData	Portugal	N/A	No	No	No

Source: Own elaboration based on Portugal Fintech Report (2020 & 2021), Firms' websites, and SIBS.

Note: *Payments services for businesses

As noted earlier, through SIBS API Market, FinTechs can access APIs that reliably connect with all significant banks in Portugal.

In addition to the FinTechs listed above, Portugal also has two licensed cryptocurrency exchanges – Criptoloja and Mind the Coin – as of June 2021.

3. International Payments Firms Operating in Portugal

For many years, through the first decade of the 2000s, there were just a few significant multinational payments firms operating in Portugal. As discussed above, these included the two U.S.-based global four-party card schemes – Visa and Mastercard – as well as the three-party US-based American Express.¹²⁴ Banco Santander, the Madrid-based global financial services firm, has operated one of the largest banks in Portugal.

These players may increase their presence in Portugal as a result of FinTech acquisitions. Mastercard's purchase of Aiiia enables it to serve as an intermediary between FinTechs and banks to provide value-added services under PSD2. Aiiia, for example, is integrated into Santander. Visa's proposed purchase of Tink could enable it to do the same. Meanwhile Santander's purchase of Pagonxt enables it to expand into provide payments services to merchants – both physical and online – and consumers.

Many multinational firms have entered, or grown their presence materially, in the last decade, in addition to the BigTech providers and PayPal already discussed.

- Firms that focus on ATMs or terminals, including virtual ones, for physical establishments include: Comercia Global Payments, Elavon, Euronet, Hipay, MyPOS, SaltPay, Sumup, VivaWallet, and Littlepay.
- Online payment processors and gateways include Adyen, Braintree/PayPal, Stripe, Worldpay, Checkout.com, Lemonway, and Mastercard. Online payment providers including wallets and credit offerings include: N26, Verse, Lydia, Curve, Wise.
- For acquiring for physical merchants, vertically integrated providers include Global Payments (partner of CaixaBank), Elavon Payments, Intercard Finance, Worldline, Paybyrd, and Viva Wallet.
- Other FinTechs include Fraud.io, Feedzai, and Auriga.
- A number of international firms started offices in Portugal which indicates likely entry and expansion including Nickel, Hi-pay, Revolut, Mollie, Tink and Anchorage.

Many multinational firms have entered, or grown their presence materially, in the last decade, in addition to the BigTech providers and PayPal.

Non-traditional issuers in Portugal, such as Revolut and Universo are using international processors such as Global Processing Services and MasterCard Processing.

4. Panoply of New Payments Players in Portugal

It bears emphasizing that these are early days in the latest digital transformation of payments. But all indications are that we have entered into a period of rapid innovation and dynamic competition, across the globe, and particularly in the EU. The digital transformation is breaking down borders as consumers and merchants gravitate towards digital, mobile, and app-based solutions. This vibrancy is already seen in Portugal. There is a panoply of new payments players in Portugal, many associated with large multinational tech firms or with well-financed and rapidly growing FinTechs and Neo-Banks.

Domestic players have some advantages in competing with these entrants into Portugal. They are well established, well known, and can differentiate their product offerings to appeal to local taste and needs. They will need to leverage these capabilities to compete with much larger businesses who can benefit from global economies of scale and scope, synergies from offering diverse product lines, and deep resources such as in machine learning, data, and artificial intelligence.

The BigTech firms obviously dwarf local firms. In 2021 Apple's global revenue was nearly 1,400 times larger than SIBS.¹²⁵ But even the payments-related parts of these firms loom large over local players. PayPal, for example, has more than 400 million active users globally which is about 40 times the population of Portugal. The traditional players, many of which have moved into digital services through investments or acquisitions are also formidable relative to domestic players. Visa, for example, processed 233 billion transactions between October 1, 2020 and September 30, 2021, compared to 7.5 billion for SIBS (31 times more) in 2021.


The BigTech firms
obviously dwarf local
firms. In 2021 Apple's
global revenue was
nearly 1,400 times larger
than SIBS.


125 Calculation based on data from S&P Capital IQ and SIBS.



Principles for
Regulation in
the Face of the
Digital
Transformation
and Global
Competition
in Payments



There is a consensus that government policy needs to balance promoting innovation, sound regulation, and competition policy.

The basic economic framework for regulation in market-based economies is well known and not controversial.¹²⁶ Markets usually lead to efficient outcomes that ultimately benefit consumers. Government policy does not condemn firms for being large, or dominant, or earning substantial profits. Normally, these are outcomes of the process of innovation, and rewards for making risky bets.¹²⁷

Yet markets can perform poorly for a multitude of reasons. Targeted interventions in the form of regulation and competition policy can fix these problems. Of course, heavy-handed regulation can also make markets work less efficiently, to the detriment of consumers, and can be captured by special interests to maintain or secure rents for themselves. Sound policy tries to minimize the costs, and risks of harmful unintended consequences from regulation, and ensure the interventions ultimately create net benefits.

In the European Union, banks and payments service providers are subject to ex ante regulation by domestic and EU laws and institutions and, as for most businesses, ex post regulation by competition authorities under EU law.

This regulation does not take place in a vacuum but is subject to changing facts and circumstances. Four features of the current and evolving state of competition in payments described above are noteworthy:

1. there is a high rate of innovation in payments and no signs of this abating in the coming years;
2. innovations in payments are coming from a much wider range of sources than in the past;
3. this dynamic competition is taking place globally as technologies and business modes make national entry far easier; and,
4. the EU has largely succeeded in creating a single payments area making national boundaries even less relevant across its 27 Member States.

¹²⁶ Laffont, Jean-Jacques and Jean Tirole (1993) *A Theory of Incentives in Procurement and Regulation*, MIT Press.

¹²⁷ Vestager, Margrethe, “How competition supports innovation”, May 24, 2016, https://web.archive.org/web/20160603221806/http://ec.europa.eu/commission/2014-2019/vestager/announcements/how-competition-supports-innovation_en (“So you won’t succeed in encouraging innovation unless companies believe you’ll let them keep the rewards. And that means that to encourage innovation, you need both competition and a reward for innovators. ...In other words, our basic principle is that innovators should get rewards. But they shouldn’t be able to stop others having the chance to innovate and compete.”)

This chapter puts forward several principles for regulation and competition policy in light of the fundamental change in market dynamics resulted from the combined forces of the digital transformation and effective elimination of national boundaries for competition. Part A summarizes some lessons we learned from the last three decades of tech innovation and regulations which are relevant for assessing tech-driven payments going forward. Part B explains some of the implications of experience with regulation and tech for payments. Part C presents four principles based on the economics of regulation and experience for applying regulation going forward. Part D considers the role of these principles in competition authorities and other regulators whose decisions are based on defining market boundaries.

A. Lessons from Tech Innovation and Regulation

The digital transformation creates new challenges as policymakers consider how new business models, and new technologies, fit into old regulatory frameworks, and address new problems that have emerged that require new interventions.

Now, almost three decades after the birth of the commercial internet, some lessons have emerged.

1. Internet-Based Firms Have Led to Substantial Innovation and Increased Competition with Traditional Firms

The massive innovation spawned by entrepreneurs seizing on the new digital technologies, largely funded by risk-taking venture capital firms, demonstrates the power of markets in driving economic progress. Tech firms have provided new and better services that have touched many aspects of our lives.

 The digital transformation creates new challenges as policymakers consider how new business models, and new technologies, fit into old regulatory frameworks. 

Tech innovation can also reduce the need for regulation by limiting the market power of incumbent players. In many countries, including those in Europe, the introduction of the Apple's iPhone and Google's Android phones, example, helped dismantle the walled app garden for mobile carriers thereby ushering in the global app economy. And telecoms have far less market power in voice communications as people have switched to internet-based video communication and messaging apps.

Most importantly, while tech firms can grow very quickly, much of that growth comes from expanding globally and entering new markets. They can increase competition for domestic players. That has occurred, most obviously, in e-commerce where it is trivial for large, and small, online firms to compete with local retailer, including large domestic physical and online ones.

The ease of multihoming in many online settings also tends to increase competition. Consumers may be able to easily switch between different websites, with their browsers, or between apps, that provide similar services. That may increase competition between these alternatives as well as with traditional firms.

2. Internet Gatekeepers Have Emerged that Can be Sources of Concern

Tech innovation, based on internet-based technologies, can also, however, result in market failures. Tech firms can acquire substantial market power, which is not necessarily a problem by itself, and then abuse that power, which is. The concern is that intermediaries can be gatekeepers which has sole discretion on allowing participants on one side of a platform getting access to those on the other side. The EU Digital Markets Act was adopted because of the concern that Big Tech, and other similar players, were distorting competition in ways that could not be addressed by competition law in an adequate or timely way.

3. Tech Firms Can Create Negative Externalities that Harm Consumers

Tech firms can also impose negative externalities on society, as current concerns over the spread of misinformation illustrate; misappropriate property by, for example, evading copyright laws; and exploit imperfection information, such as those concerning data and privacy. Tech firms can also evade sound regulation that protects consumers, and the economy, and engage in regulatory arbitrage.

Of course, all firms can cause these harms. Tech firms can be more problematic because of viral effects that can spread quickly within countries and globally.

These concerns have become paramount in Europe. They have to led the Digital Services Act, which tries to limit various sources of harms that can arise from online firms.

4. Early Asymmetric Regulation Had Unfortunate Unintended Consequences in the Growth of the Internet

In the U.S., and many other countries, governments adopted a lenient approach towards internet firms believing that special protections were needed to spur innovation. Laws and regulations that applied to content – including those involving libel and misinformation – were greatly relaxed for internet platforms.¹²⁸ In the U.S., for example, internet platforms bear virtually no liability for third-party content posted on their sites. In addition, government policy reduced copyright infringement liability resulting from third parties posting content on their sites; at the same time the new technologies made it easier to appropriate the value of copyrighted content without technically infringing on copyrights.

Many of the current concerns over market failures, and social harms, caused by ad-supported internet firms are the direct consequences of these decisions. Internet platforms had limited incentives to limit harmful content on their sites particularly if the content helped increase viewership and advertising. They also had strong incentives to encourage third parties to post copyrighted content that could drive viewership and advertising.

Recent regulatory efforts are trying to address these problems but are doing so after these platforms have become large, global, and integrated into our lives. The EU, U.S., and other jurisdictions are considering legislation to make platforms liable for the harmful effects of content. They are also considering regulations to increase compensation to copyright holders, particularly to the newspapers. Australia, following recommendations by its competition and consumer protection authority, enacted legislation that requires Facebook and Google, found to be dominant platforms in that country, to pay news media for content used on their sites.

128 Evans, David (2020) "Deterring Bad Behavior on Digital Platforms," in D. Evans, A. Fels, and C. Tucker (eds.) *The Evolution of Antitrust in the Digital Era: Essays on Competition Policy, Volume 2*.

This experience illustrates that asymmetric regulation – giving one type of business a break – can have negative long-term consequences. Asymmetric regulation provides an implicit subsidy to one business model, and an implicit tax on another business model. That distorts market outcomes by promoting the formation and growth of businesses, in the favored sector.

The liability and copyright infringement leniency programs, for example, likely encouraged investments in ad-supported platforms that rely on third-party content, at the expense of investment in other less favored tech areas, or alternative business models for content. And it also likely contributed to the decline of traditional firms that faced increased competition by firms supported by these subsidies. Although these effects are clear in theory, and seem consistent with the general evidence, the magnitude of these distortionary effects is not known.

B. Striking the Right Balance in Payments

Tech firms have increased dynamic competition, and spurred innovation in payments. A wide variety of tech firms have followed in the footsteps of PayPal to create important innovative payment services. Open banking has accelerated the pace of entry of FinTechs and increased innovation related to consumer banking and payments as we saw earlier. Regulatory sandboxes, including the one provided in Portugal, have helped reduce entry barriers from having to comply with costly regulations.

The success of mobile money schemes in lesser-developed countries illustrates the importance of flexibility in imposing regulation on payments innovators. M-Pesa, the pioneering mobile money scheme in Kenya, was made possible because the Kenyan government decided not to subject the new scheme to onerous banking regulation.¹²⁹ M-Pesa was required to keep reserves in a bank to cover the value of the mobile money used by its participants but was otherwise shielded from regulations that could have prevented its operations. This targeted approach – regulation where regulation was needed – enabled Kenyans to obtain convenient payment services, through M-Pesa, and eventually other banking and financial services for mobile-money users. Other countries that tried to reserve mobile money schemes for banks have largely failed to get these them off the ground.¹³⁰

Competition and regulatory policy should avoid creating barriers that prevent efficient competition from tech firms and other innovators and that thereby preserve rents of incumbents. That is just as true for banking and payments as it is for other sectors.

When regulations are sound, however, they should, as a general matter, be applied to innovators, including BigTech and FinTech players. And when they are not sound, or outmoded, they should generally not be extended to tech firms, but also should be relaxed or eliminated for traditional players. Absent a strong justification, regulation should not be biased in any direction, for or against tech and traditional players.

In payments, policymakers need to exercise care not to distort incentives that could disfavor traditional firms or discourage investment in infrastructure that others, including the tech firms, rely on. Currently, in Portugal traditional local payment service providers have to comply with a variety of regulations that tech firms do not have to comply with, as discussed earlier.

129 Evans, David and Richard Schmalensee (2016) *Matchmakers: The New Economics of Multisided Platforms*, Harvard Business Review Press at Chapter 11.

130 Evans, David and Alexis Pirchio (2015) “An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries but Flounder in Most,”

13(4) *Review of Network Economics* pp. 397-451.

The flipside is also true. Policymakers need to avoid regulations that disfavor investments in new methods of payment or bias consumer choice in favor of new versus old methods without sound reasons. We have already seen that regulations that limit fees for ATM withdrawals tend to encourage cash versus digital use, which has an adverse effect on traditional digital payment service providers as well as FinTechs.

One interesting asymmetry that has emerged recently in several countries involves the treatment of merchant fees. A number of FinTechs have popularized “buy-now pay later” (BNPL) which includes installment plans and other products that in effect enable consumer to finance purchases. They often charge merchants, who use BNPL offerings to get incremental sales, a percent of the transaction. Those fees are analogous to merchants discounts which are largely determined by interchange fees for the global card networks. The BNPL fees are not regulated while similar fees that merchants pay through card interchange fees are.

C. Three Principles of Regulation

In light of these considerations, government policymakers should keep three key principles in mind in considering where to strike the right balance between innovation and regulation.

Principle 1: No Business Model Bias. Regulation should not be biased for or against different types of players, particularly given uncertainty over the risks and rewards of various solutions.

When regulations have a sound basis, such as in protecting consumers or the safety of the financial system, they should be applied to innovators, including BigTech and FinTech firms. When they lack a sound basis, perhaps because innovations or other changes in circumstances render them unnecessary, they should be relaxed for traditional players as well as not being extended to new ones.¹³¹

Failure to adhere to this principle can promote new business models that engage in harmful practices – based on the same experience that led to the regulations in the firm place. Forbearance could remove incentives for new business models to avoid harmful practices or in fact encourage new business models that have harmful practices as a core feature.

Innovation could also result in questioning the assumption that practices, once thought harmful, really are. Exempting new business models while continuing to apply regulations to existing ones penalizes traditional firms who may be more efficient than new ones in the absence of the unfair advantage given to new firms.

Government policymakers should keep three key principles in mind in considering where to strike the right balance between innovation and regulation: 1) No Business Model Bias; 2) No Firm Location Bias; 3) Limit Free-Riding.

131 For a general framework for assessing tech regulation see Evans, David S. (2021) “Tech Reg: Rules for the Digital Economy,” CPI TechREG Chronicle, December 2021, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3969436.

Principle 2: No Firm Location Bias. Regulation should not be biased for or against domestic players. Consumers benefit from competition regardless of the home base of the company. Biases against domestic firms can arise when regulators place too little weight on competition from tech players, which can become powerful competitors quickly, as a result of network effects and scale economies combined, and too little weight on the likelihood of entry by non-domestic tech and traditional firms. It can also arise when domestic firms face competition from firms operating with a passport from firms domiciled in countries with lighter regulations, creating an unlevel playing field in the domestic market.

The point isn't that regulation should encourage national champions for their own sake. In fact, by biasing regulation against domestic firms may make it more difficult for these firms to expand outside of their national boundaries. As a result, other countries lose competition that could be created by traditional domestic players.

Likewise, of course, consumers would lose if non-domestic firms faced requirements that limited their ability to compete domestically. The digital transformation has clearly shown the benefits of giving consumers more choices even if that results in traditional domestic firms losing out.

Principle 3: Limit Free-Riding. Regulatory policy should avoid allowing new firms from free riding on traditional players, including the use of infrastructure, intellectual property, and customer acquisition. Doing so ultimately suppresses valuable investment by traditional players and can harm all players. As discussed above, the risks of doing so are apparent from the policy decisions in the early years of the commercial internet that shielded internet platforms from libel laws and from infringing on intellectual property.

Long-standing government policy has recognized that there is a trade-off between providing wide access to new knowledge which can result in economic efficiencies and follow-on innovation, and giving innovators, investors, and companies incentives for creating new knowledge in the first place. That is why firms can secure intellectual property (patent, trademark, copyright and trade secret) protections over some things (such as a new method for grinding coffee beans) but not others (like the idea of having high-quality coffee shops).

The purpose of principle 3, on limiting free-riding, is not to change that fundamental tradeoff, but to ensure that regulatory policy continues to respect the important role that property rights play in promoting innovation and investment and thereby driving economic efficiency.

Regulatory policy should, of course, also avoid creating barriers that prevent efficient competition, and innovation, from tech firms thereby protect incumbents from gales of creative destruction.

Markets and consumers should ultimately decide the role of different business models. In some cases, tech players will drive traditional rivals out, in other cases they will co-exist for long terms of time, and in still other cases traditional models may be superior. Competition authorities and courts should exercise care that they don't bias the outcome in ways that would ultimately harm consumers and the economy.

D. Avoiding Biases in Defining Market Boundaries

Several of these principles are important to keep in mind for competition authorities and other regulators whose decisions are heavily influenced by how they define market boundaries.

Regulators face significant challenges in determining market boundaries when evaluating competition in new, fast-moving, and often fluid sectors like tech. A common issue during the digital transformation is the extent to which tech and traditional players compete with each other.

Commonly used methods for market definition can result in narrow markets for traditional players that leave out the tech players that are their most serious challenges. That is often seen in media where regulators define markets of newspapers or television that don't include the very rivals that are peeling off advertisers and viewers. When present these biases can advantage tech players who can achieve dominance, internationally, from networks effects, scale economies and low barriers to country entry.

Regulators face significant challenges in determining market boundaries when evaluating competition in new, fast-moving, and often fluid sectors like tech. A common issue during the digital transformation is the extent to which tech and traditional players compete with each other.



Concluding Remarks



Payments is the circulation system for the economy. Like the body, the economy, as least as we've known it, couldn't survive without payments. Over time payments have gotten dramatically more efficient through episodic disruptive innovation, such as general-purpose cards, and incremental improvements, such as mobile POSs. Today though, as part of the digital transformation, innovation has exploded. It is coming from traditional players, such as the development of mobile payments and highly efficient real-time payment rails for banks; FinTechs and BigTechs, such as in digital payment processing and mobile payments; and potentially from crypto solutions based on public or private blockchains.

As with other aspects of the digital transformation, national walls have become more porous. New firms can start, grow quickly through network effects, and become a competitive presence in many countries. In a relatively short space of time many European countries, Portugal included, have a large number of FinTechs, neo-banks, and Big Techs competing for consumer and merchant business. The share of payments flowing through these players is small, and many alternatives won't survive, but history suggests that some will become serious contenders in payments. As these are early days for this round of innovation, more startups will appear.

Meanwhile, central banks, including the European Central Bank, are pursuing innovations of their own. That includes, in the EU, the various SEPA initiatives, including SCT Credit Inst, as similar efforts to launch instant payment networks, which will become interoperable around the world. Although at an early stage, central banks, including the ECB, are exploring central bank digital currencies. If successful, these efforts could make many of the benefits of crypto mainstream without raising the other concerns with these private and hard-to-regulate solutions.

We know from experience that policymakers have to exercise care in navigating their way through the digital transformation and its creative destruction of the old economy. Traditional banks and payment service providers, FinTechs and neo-banks, and Big Tech firms all have important roles to play. There is no single model for regulation going forward given the complexity and nuance of the issues. Policymakers should avoid deviating from two rules without good cause. Regulation should be imposed only when there is a market failure, for which there sound evidence, and a solution that does more good than harm. Regulation should be symmetric so that it doesn't, without sound reason, advantage or disadvantage particular kinds of businesses or technologies.

Appendix:

Structure of the Portuguese Retail Payments Industry

Four main categories of participants comprise the Portuguese payments industry today: (1) banks which hold payments accounts and issue debit and credit cards; (2) domestic and international card schemes; (3) processors, acquirers, ATM networks and other shared infrastructure providers; and (4) Banco de Portugal (BdP), the central bank, which issues cash, operates the gross settlement system, and sets the rules for banking and payments, along with national legislation. Myriad other players are also involved.

1. Retail Banks

Ranked by consumer deposits, the 10 largest banks in Portugal account for 96 percent of consumer deposits.¹³² Table A-1 lists the top 10 banks and provides key details including whether they are domestic or foreign; three of the ten are owned by large Spanish banks. Most Portuguese households have a payment account with one of these banks, which they use to manage their finances. The paychecks of members of the household are often deposited automatically into their accounts.

Table A-1 Summary of Banks Operating in Portugal as of December 2020¹³³

Bank	Assets (billions)	Deposits (billions)	Share of Deposits	Foreign or Domestic
CGD	€ 85.5	€ 66.0	28.8%	Domestic
Millennium bcp	€ 64.0	€ 41.5	18.1%	Domestic
Santander Totta	€ 57.4	€ 36.7	16.0%	Spanish
Banco BPI	€ 37.6	€ 26.0	11.4%	Spanish
Novo Banco	€ 44.0	€ 25.8	11.3%	Domestic
Montepio	€ 19.7	€ 12.5	5.5%	Domestic
Euro BIC	€ 8.5	€ 5.6	2.5%	Domestic
Activobank	€ 2.2	€ 2.1	0.9%	Domestic
BBVA	€ 3.9	€ 2.0	0.9%	Spanish
Banco CTT	€ 1.9	€ 1.7	0.7%	Domestic

Source: Associação Portuguesa de Bancos. Banco BPI is owned by CaixaBank.

More European banks are entering Portugal, such as Revolut and Open Bank, as a result of the rise of neo-banks and the availability of APIs under open banking and facilitated by the API Market.

¹³² Associação Portuguesa de Bancos, “Statistics: Separate Balance Sheets” December 2020, https://www.apb.pt/publications_and_papers/publications/statistics/.

¹³³ Associação Portuguesa de Bancos, “Statistics: Separate Balance Sheets” December 2020, https://www.apb.pt/publications_and_papers/publications/statistics/.

Portuguese consumers can obtain a payment account that provides a wide variety of payment and banking services for typically less than €5 a month and banks typically require consumers to have a minimum balance of around a few hundred euros.¹³⁴ These services are included without any additional charges:

- Ability to get various payment and banking services at a branch
- Online and mobile banking which includes payment services
- ATM/debit cards that provide access to ATM services – including cash withdrawal and remote bill payment as discussed further below and ability to pay at merchants that accept cards.
- Checking
- Direct debit which provides for automatically paying bills
- Credit transfers (including instant transfers)

In addition, banks issue credit cards for the international card brands, as discussed below.

Businesses also make use of payment accounts at these banks to manage receivables and payments to their employees and suppliers. Their bank typically provides a variety of payments services including the receipt of cash, credit facilities, B2C services such as bill payment, and B2B payments services.

Banks typically work with three kinds of businesses to provide payment services to their consumer customers: domestic and internal card networks of cardholders who have the network brand and merchants who accept the network brand; providers of shared infrastructure such as the ATM network; and the central bank which issues cash and other entities that help move it around. They also increasingly work with BigTech and FinTech firms as discussed above.

2. Card Schemes

MB is the domestic payment scheme operated by SIBS, discussed above. SIBS MB manages the domestic card scheme, providing debit card functionalities for banks to issue debit cards, which also function as ATM cards, and for merchants to accept MB debit cards on compatible EFTPOS terminals, or online. Consumers with MB cards issued by their bank can then pay at accepting physical and online merchants. SIBS MB historically played a pivotal role in the mass diffusion of acquiring in EFTPOS in Portugal. It is accepted by around 390 thousand terminals as of the end of 2020.

Mastercard and Visa are international four-party schemes. They work with banks, who deal directly with cardholders, to issue credit cards; and with card acquirers, who deal directly with merchants. Most major banks in Portugal belong to Mastercard or Visa for issuing credit cards. China Union Pay is also present and Discover is making inroads in acquiring and is expected to issue cards as well.

As noted above, banks issue credit cards that provide credit functionality through the international schemes, but many times also enable MB thereby providing both credit and debit functionality. They also issue debit cards which have a bug for an international card schemes so that account holders can use the card to pay abroad and withdraw cash from foreign ATM machines.

¹³⁴ In Portugal, “basic bank accounts” are a set of essential banking services which citizens can access at a reduced cost (no greater than 1% of the value of the social support index, which corresponds to an annual cost that cannot exceed €4.38 during 2021). See Banco de Portugal, “Basic Bank Accounts: What it is,” <https://clientebancario.bportugal.pt/en/what-it-is>; Banco De Portugal, “What is a basic bank account?,” <https://www.bportugal.pt/en/page/what-basic-bank-account>. The cost of bank accounts that offer additional services typically cost less than less than €5 per month. For example, see Caixa Geral de Depósitos, “Conta-Caixa (Solução Multiproduto) E Continente,” <https://www.cgd.pt/Particulares/Contas/Pages/Conta-Caixa.aspx>; “Expatica,” “How to open a bank account in Portugal,” <https://www.expatica.com/pt/finance/banking/opening-a-bank-account-in-portugal-105170/>; Wise, “How to open a bank account in Portugal,” <https://wise.com/us/blog/opening-a-bank-account-in-portugal>; Get Golden Visa, “How to Open a Bank Account in Portugal,” <https://getgoldenvisa.com/bank-account-in-portugal>.

3. Processors, Acquirers, and Other Infrastructure Providers

SIBS FPS is the main payment processor in Portugal for card and account-to-account transactions. It processes transactions between consumers and businesses for the MULTIBANCO network. MULTIBANCO is the main domestic payment network in Portugal, covering mainly ATM, POS and home banking access, offline and online. SIBS FPS also processes card transactions for both the domestic scheme and international schemes including Visa and Mastercard. As a payment processor, it authenticates consumers, obtains authorization from the issuer to make payment, and facilitates payments to merchants. MULTIBANCO also integrates an inter-banking ATM network in Portugal for 27 banks which account for about 99 percent of consumer bank deposits.¹³⁵

SIBS FPS develops, and makes available to banks and merchants, features and functionality that facilitate consumer payments and transactions, both for acquiring (e.g., a digital gateway that merchants can use for accepting several payments instruments) and for issuing (e.g., MB NET or MB WAY).

As noted above, SIBS is also the processor and automated clearing house for account-to-account transactions, under the SEPA schemes, thereby providing connectivity to the European payment system – in all of SEPA scheme modalities. In particular, SIBS' SEPA Instant Payments Solution allows banks to make available to their customers account-to-account transfers of up to €100,000 and delivered within seconds, all across Europe as it provides interoperability through TIPS (TARGET Instant Payment Settlement).¹³⁶

SIBS FPS provides technical services to a myriad of acquirers in Portugal, for the domestic and international schemes. These include a significant part of the banks described above but also Reduniq, a specialized payments player, and SIBS Pagamentos, the group's Payment Institution engaged in EFTPOS and ATM acquiring.

Independently from SIBS, many players are already entering and operating in Portugal, varying from large integrated players (such as Worldline, Elavon, Borgun/ SaltPay or Intercard Finance) or niche operators such as Viva Wallet, Paybyrd or Sumup.

Any processor and acquirer can enter and operate in Portugal using a passport from a Member State. Likewise, SIBS Pagamentos is operating in Poland and Romania based on their passport from Portugal.

4. Banco de Portugal, Laws and Regulation, and Cash

Banco de Portugal is the payments supervisor and therefore sets and enforces rules for the payments system. It is the formal owner and regulator of the clearing and settlement systems. National laws also regulate financial institutions and other payment service providers.

a. Banco de Portugal and the Cash Ecosystem

Banco de Portugal is, effectively, the ultimate owner of the one of the most commonly used payment methods: cash. There is a stock of cash in Portugal that is based on the past decisions by the BdP domestically, and the European System of Central Banks (ESCB), to issue euro notes and coins and their decisions to

¹³⁵ Calculations based on deposits reported in Associação Portuguesa de Bancos, "Statistics: Separate Balance Sheets" December 2020, https://www.apb.pt/publications_and_papers/publications/statistics/.

¹³⁶ SIBS, "Payments on Account," <https://www.sibs.com/en/produtos/payments-on-account/>.

retire older notes from circulation. The BdP and ESCB periodically add to or replenishes this stock by issuing more notes and coins. Banks have a demand for notes and coin to stock their ATM machines and branches and to supply merchants. Banks buy notes and coins from the Banco de Portugal in return for interest bearing securities.

Banks typically hire cash-in-transit operators to transport cash securely from the BdP to vaults across the country and then from these vaults to the bank. They hire these same operators to restock ATMs. Internally, the bank usually has a cash management operation that stores cash and also makes sure that it has enough cash for branches and ATMs. Larger retailers also hire cash-in-transit operators to collect cash periodically at their locations and transport that cash to their banks where it is credited to their accounts. Smaller retailers deposit their cash proceeds themselves.

In 2019, consumers obtained 62 percent of the cash they used from ATMs and the remaining portion over-the-counter at bank branches and a few other sources.¹³⁷ The share of cash obtained over-the-counter has declined substantially over time.

b. Laws and Regulations that Influence Competitive Dynamics

Banco de Portugal has also adopted various regulations that are relevant to the discussion in this report either because they influence the adoption of certain forms of payment, particularly cash, or because they result in asymmetric obligations for traditional domestic players compared to foreign entities or tech players.

National laws prohibit banks from charging for ATM cash withdrawals¹³⁸ thereby providing a subsidy to the use of cash, in addition what BdP spends directly for operating its part of the cash system. This legislation is an illustration of a situation of “unlevelled playing field” favoring cross border institutions (with a Passport to operate in Portugal), since many of them have explicit commercial policies to charge for withdrawals, effectively acting on a lever to lowering costs that Portuguese banks don’t have access to (hence having to reflect higher costs on other bank commissioning). Meanwhile, European Commission regulations have reduced the interchange fees card schemes can provide issuers and thereby the value card issuers can pass along to consumers. These policy choices tend to encourage the use of cash over card.

The law prohibiting charges for ATM withdrawals was extended to credit transfers made through payment applications that are operated by third parties in 2020.¹³⁹ Payment service providers such as banks can charge commissions only if the transaction is more than €30, more than €150 is transferred in month, or more than 25 transfers take place month. When one of those limits is surpassed the payment service provider can charge no more than 0.2 percent for debit card transactions and 0.3 percent for credit card transactions. This law provides an implicit subsidy to FinTechs.

For certain activities in the Portuguese market, domestic players are subject to regulations by Banco de Portugal while foreign players are subject to regulations by their central banks (or other national competent authorities). Banco de Portugal rules has adopted a more restrictive interpretation of EC laws than the national competent authorities in other member states. That has resulted in domestic players facing more limiting and costly requirements than their foreign competitors.

¹³⁷ European Central Bank, “Study on the payment attitudes of consumers in the euro area (SPACE)” at Chart 59.

¹³⁸ Law decree number 3/2010.

¹³⁹ Law-decree number 53/2020.

For anti-money laundering, foreign players have a diverse set of remote options for verification, such as biometric data, while domestic players have to use a trust service provider and a video with very strict criteria to onboard customers. For free services that must be available on the Open Banking API, BdP has chosen to include MULTIBANCO and MB WAY operations although these go beyond the ones enshrined in PSD2, and that are included in other member states. A related issue concerns strong customer authentication (SCA) where BdP has tended to adopt stricter interpretations, including related to MB NET, than in other member states.

Thus, in Portugal, as in other Member States, payment service providers face different regulations depending on where they were authorized. Domestic firms must abide by Portuguese regulations while non-domestic firms do not, but instead must abide by the regulations of the country from which they are authorized. In effect, participants in the Portuguese markets are potentially subject to varying laws, regulations, and supervisors from across Europe, depending on where they were authorized, resulting in an unlevel playing field in Portugal, as elsewhere.



