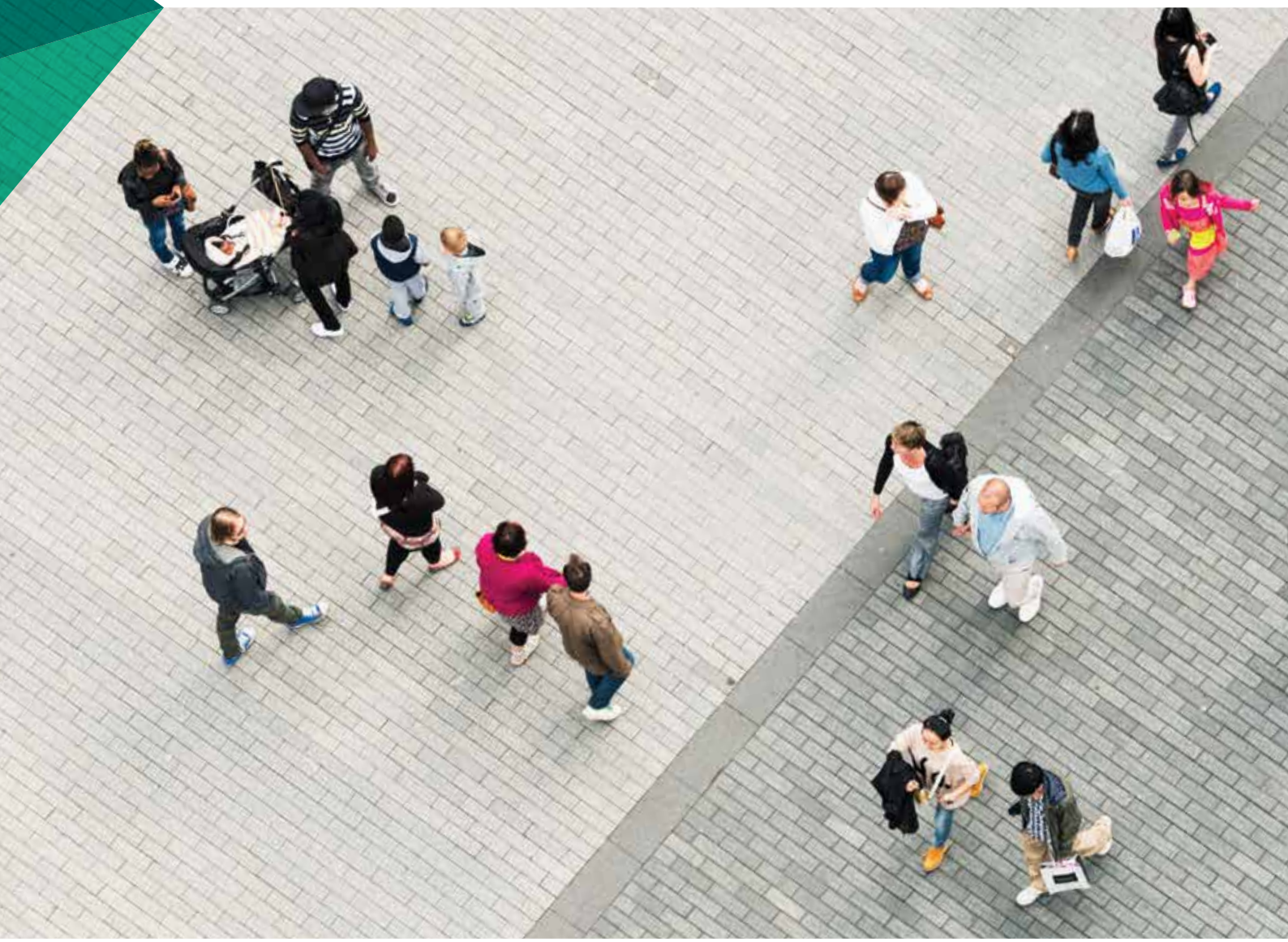
OLIVER WYMAN

EU RETAIL AND SME PAYMENTS

STATE OF THE INDUSTRY



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EXECUTIVE SUMMARY

We are excited to bring you our first flagship European Retail and SME Payments report, covering 28 markets from the United Kingdom and Ireland to Continental Europe and the Nordic and Baltic countries. The payments market is undergoing unprecedented changes, and our report covers a number of trends and detailed analysis of revenue pools.

The report investigates all major payments instruments and types, including cards, account-to-account (A2A), cheques, and cash, both for retail (person-to-person (P2P) and person-to-business (P2B)), and business (business-to-business (B2B) and business-to-person (B2P)). Remittances, wholesale transfers, transfers among banks, and cross-border payments beyond Europe have been excluded. We have categorised the 28 countries covered across Europe into six payments markets, based on the structure and maturity of the payments infrastructure – for example, United Kingdom and Ireland (UK&I), Central Europe, France and Benelux, Southern Europe, the Nordic states, and other European Union (EU) countries.

We believe the European payments market revenue pools currently amount to approximately €38 billion, covering a total of €190 trillion worth of transactions across a number of payments methods (including cash and fee income across all channels).

Overall, we expect the market to continue to grow until 2020 at a year-over-year rate of around 7 percent, driven by the growth in overall payments volumes (across both mature and less mature markets), as well as the growth of new types of payments, such as A2A. We forecast very modest reductions in margins on existing payments types, but do expect the substitution of existing revenue streams by new forms of payments, such as the debit equivalent for A2A. Other forecast trends are as follows:

- Growth in acquiring revenues on traditional payment types may have peaked, but this is being offset by the growth in value-added services. Acquirers are also looking to capture newer forms of payments (including growing e-commerce and emerging A2A transactions).
- Growth is expected in account fees (amounting to a 10 percent compound annual growth rate (CAGR) from 2014 to 2020).
- A2A will provide the impetus for additional revenue pools (approximately 6 percent CAGR, 2014-2020), although the associated revenue pool (around €2 billion) is still nascent and represents a fraction of the revenue from cards.
- Cards will continue to grow (8 percent CAGR in debit and 4 percent in credit from 2014 to 2020), although the growth in some markets will be slowed by the adoption of A2A transactions.
- While in certain markets, such as Iberia and Italy, cash use is still expected to remain significant, electronic transactions (cards and A2A) are in the growth mode in the UK and Ireland, and in France and Benelux. Meanwhile, in other markets such as the Nordics, some cash substitution is expected to be taken up by A2A.

The payments market continues to be dynamic. New technologies, new players (such as third-party payment service providers (TPPs)), a shift in the regulatory landscape, and changes on the supply and demand side are changing market models. We anticipate that:

- Larger players (such as vertically integrated payments companies) participating in all areas will perform well.
- Smaller, niche players will also perform well (such as emerging fintechs and payments companies that focus on P2P/P2B, mainly for on-the-go payments).
- Players with no specific value-added services and low volumes (such as acquiring businesses within banks) face commoditisation, and may struggle.
- There is a greater need for focus. For example, banks where payments serve as a non-core activity may need to decide either to become more committed or pull out altogether.

Changes in the future supply side are expected to have an impact on the mix of payments methods, such as in the growth in A2A payments, replacing cash and card transactions. New propositions, including account information service providers (AISPs) and payments initiation service providers (PISPs), would allow for more disruption but also spur innovation.

As a result of changes in the regulatory and technology landscape, market participants must consider their business response to the future payments market. We have outlined a health checklist for all player types in the market, enabling them to see if their business is on course to succeed in this ever-changing market. This list includes:

- Clarity on the implications of regulations for your business (most importantly, the payments services directive (PSD2)).
- Participation strategy around A2A – i.e., whether it should be defensive or proactive.
- Avoiding indirect disintermediation, likely to be the result of emerging propositions by established and new players.
- Adapting the business model and building a service subscription type for payments, alongside transaction-driven revenue.

Overall, we expect the European retail and small and medium-size enterprise (SME) payments market to remain buoyant and dynamic over the next few years, given the new regulatory changes and uptake of new technology, both by customers and providers.

PURPOSE OF THIS PAPER

The payments market is evolving at a rapid pace with the advent of new technologies, consolidation, new and innovative players, radical regulation, and changes in the way customers are using payments – i.e., increasingly as an embedded product.

As a result, it is imperative that the various market participants formulate their approaches on a go-to-market strategy, with a full understanding of the optimal business models and the emerging revenue pools. This paper aims to provide the overview of the retail and SME payments market in Europe, including trends and estimates of size, along with the strategic responses for the different players.

This report looks at pure payments markets across Europe (i.e., excluding revenue streams, such as lending income on credit cards), in the hope that this makes an interesting and useful read for all audiences – banks, payments providers, technology companies, and new players (including TPPs).

This report does not assess the impact of Brexit, as the UK's access to single market continues to be the subject of discussions and the implications on financial services remain unclear.

OVERVIEW OF THE RETAIL AND SME PAYMENTS MARKET

MARKET STRUCTURE, KEY PLAYERS, AND RECENT TRENDS

The European retail payments network is made up of a number of different participants, some of whom are active across different payments methods and different parts of the value chain. The competitive landscape also varies significantly by geography. Consequently, the landscape is complex and highly fragmented.

To simply this complexity, we divide participants into two broad industry groups for our revenue pool calculations:

Account providers: consumer-facing service providers – such as current account providers or credit card providers – with a brand and service offering that is likely to be very familiar to the transacting customer.

Acquirer and network providers: merchant-facing service and infrastructure providers. Collectively, these parties provide network services and are responsible for authorising, routing, and processing a particular payment. Parties in this chain include, for example, merchant acquirers, the cards schemes, and processors.

Exhibit 1: High level framework for characterising P2B/P2P payments

MARKET STRUCTURE

		PAYER	NETWORK				RECEIVER
			PROCESSING				
		Account provider (PCA)	Issuer	Scheme	Acquirer	Gateway/ PSP/Terminal	Account provider (PCA/BCA)
Payment means	Cash	✓	✗	✗	✗	✗	✓
	Debit cards	✓	✓	✓	✓	✓	✓
	Credit cards	✓	✓	✓	✓	✓	✓
	A2A credit transfers	✓	✗	✗	✓	✓	✓
	A2A direct debit	✓	✗	✗	✓	✓	✓
	Cheque	✓	✗	✗	✗	✓	✓

EXAMPLE: EU RETAIL AND SME PAYMENTS (NOT EXHAUSTIVE)

Payment means	Cash	Lloyds Banking Group, Sparkasse, HSBC, Nordea, Intesa Sanpaolo, Swedbank, Credit Agricole, Banque Populaire, Barclays, Clydesdale Bank, BBVA, Santander, The Royal Bank of Scotland, Commerzbank					Lloyds Banking Group, Sparkasse, HSBC, Nordea, Intesa Sanpaolo, Swedbank, Credit Agricole, Banque Populaire, Barclays, Clydesdale Bank, BBVA, Santander, The Royal Bank of Scotland, Commerzbank
	Debit cards		Capital One, JCB, MBNA, Sainsbury's Bank	Visa, Mastercard, Carte Bancaire, Diners Club, Amercian Express, Pago Bancomat	Elavon, Global Payments, First Data, Nets, Santander, Worldpay, Intesa Sanpaolo, HSBC, BBVA	Sage Pay, Nets, Verifone, Paypal, Adyen, Ingenico, Worldpay, Ogone	
	Credit cards						
	A2A credit transfers			Vocalink, Bacs, Faster Payments, CHAPS		Satispay, Bacs, Faster Payments, Pingit, CHAPS, Trustly, Swish	
	A2A direct debit			Bacs, Direct Debit, ELV		BACS, Direct Debit, ELV	
	Cheque			Cheque & Credit Clearing Company, Iberpay, Banque de France		Cheque & Credit Clearing Company, Iberpay, Banque de France	

Source Oliver Wyman analysis

Note Distributors / ISOs also active in some European markets

In this part of the report, we summarise the roles, revenue streams, and key trends affecting participants within these two broad industry groups, and calculate historical revenue pools, broken down by geography and category.

Exhibit 1 provides an overview of the payment means and services that are included in the scope of this report. It also provides some examples of service providers that operate along the chain.

ACCOUNT PROVIDERS

In this report, we consider two types of account provider:

1. Current account providers – personal (PCA) and business (BCA)
2. Credit card issuers

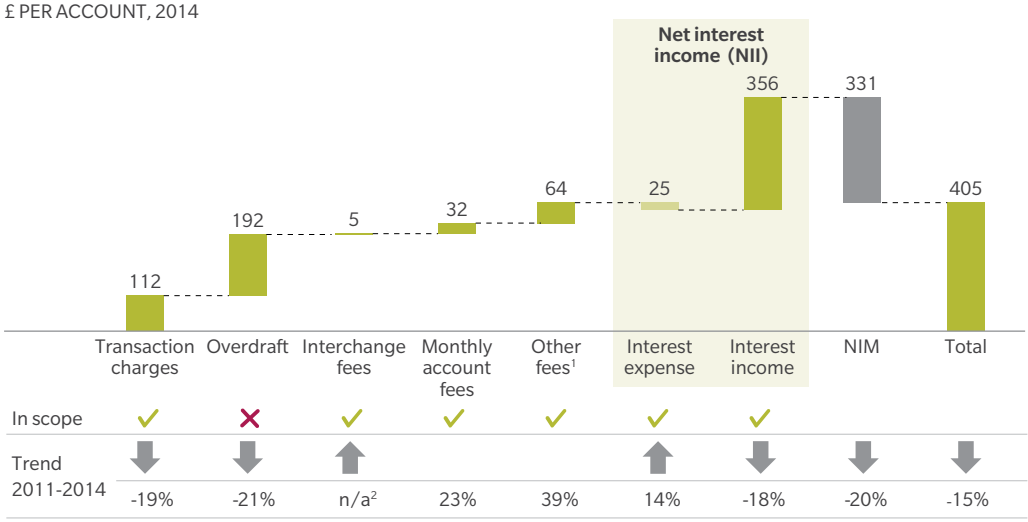
This section provides a summary of their role, revenue streams, and the key trends that have impacted their economics.

Current account providers

Account economics are driven by net interest income (NII), monthly or annual account maintenance fees, overdraft, and other fees related to credit facilities linked to the account. Exhibit 2 shows a case study of the market average breakdown of BCA revenues across UK providers, and trends from 2011 to 2014.

Exhibit 2: Case study: UK BCA revenue breakdown

£ PER ACCOUNT, 2014



1. Includes occasional, account criteria and account mgmt. charges, and other revenue from account holders and other parties
2. Interchange fees 0 in 2011

Source CMA report, Oliver Wyman analysis

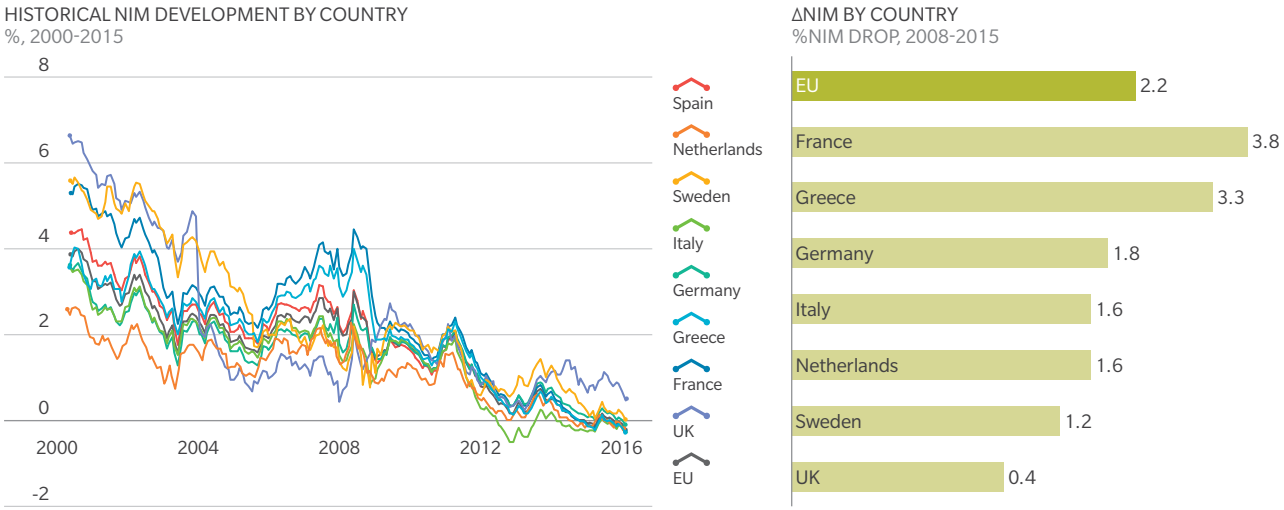
Current account economics are coming under increasing pressure:

- A low interest rate regime in Europe has led to a compression of NIM (net interest margin) on account balances (see Exhibit 3).
- Multilateral interchange fees (MIF) regulation has capped interchange fees for both debit and credit card transactions (see "MIF" for more details).
- In more mature markets, in particular the UK, there is a regulatory drive to make current account pricing structures simpler and more transparent to customers, such as by reducing penalty and other one-off charges.
- New digital banks looking to attract market share by offering account fees at close to free of charge, or offering cards for free.

Despite competitive pressure from digital banks, many incumbent banks across Europe have introduced or raised monthly or annual account maintenance fees to cover the shortfall in revenue.

PCA providers in most European markets do not charge individuals for transaction activity on their account, choosing instead to absorb the related costs, such as processing fees charged by the networks. Account providers rely instead on other revenue streams to effectively subsidise this transactional activity. Some notable exceptions include: fees for processing cheques in market where cheques are becoming obsolete, such as the Nordics and the Netherlands; and A2A transfers executed on some networks, typically large value payments networks that offer real-time gross settlement (RTGS) in central bank money (such as CHAPS credit transfers in the UK). Charges for ATM cash withdrawals are also levied in some countries, such as Spain.

Exhibit 3: Net interest margin evolution



Source: ECB statistics, Oliver Wyman analysis

Note: NIM calculations exclude liquidity buffer charges but include estimates of funding premium. NIM is calculated as Interest income – Interest costs; Interest income for BCAs is proxied by considering 3M EURIBOR or equivalent and five year swap rates.

Most PCA providers throughout Europe charge customers a modest annual or monthly account maintenance fee. There are exceptions to this rule where most consumers would not expect to pay a monthly charge for a standard current account offering.

BCA fees are typically higher, and pricing structures more complicated than PCAs. Transactional activity on these accounts typically incurs a charge. For example, leading BCA providers in Netherlands levy a €0.05- €0.15 fee per transaction for sending some A2A payments.

Major banks in most countries offer small businesses the choice of graded tariff structures, where higher monthly fees can be substituted for lower fees per transaction. For example, in the UK, major banks offer their customers a choice between two distinct product propositions:

E-payments: for businesses, such as e-commerce companies, which conduct a significant proportion of transactional activity via A2A and other electronic payment.

Mix payments: for businesses, such as convenience stores and other small high street merchants, where a large proportion of transactional activity is in cash or cheques.

These arrangements are also common in other European Union (EU) markets.

Exhibit 4 provides an overview of the BCA and PCA revenue streams that we model in our account provider revenue pools.

Exhibit 4: BCA and PCA revenue streams and scope of our revenue pools

REVENUE STREAMS	IN SCOPE OF OUR REVENUE POOLS?
Net interest income (NII) on account balances	✓
Fees charged to customers	
• Periodic account maintenance fees (annual or monthly)	✓
• Cash management fees (e.g., for depositing cash in BCAs)	✓
• Transaction fees (e.g., for A2A payments, cashing cheques, ATM withdrawal fees)	✓
• Cardholder fees	✓
• Interchange fees	✓
• Charges for unsuccessful transactions (e.g., funds not present)	✗
• Surcharges for transactions executed on alternative channels (e.g., telephone banking)	✗
• Overdraft and other fees related to credit facilities linked to the account	✗
• Extraordinary fees (e.g., for duplicate account statements) and incidents	✗

Card issuers

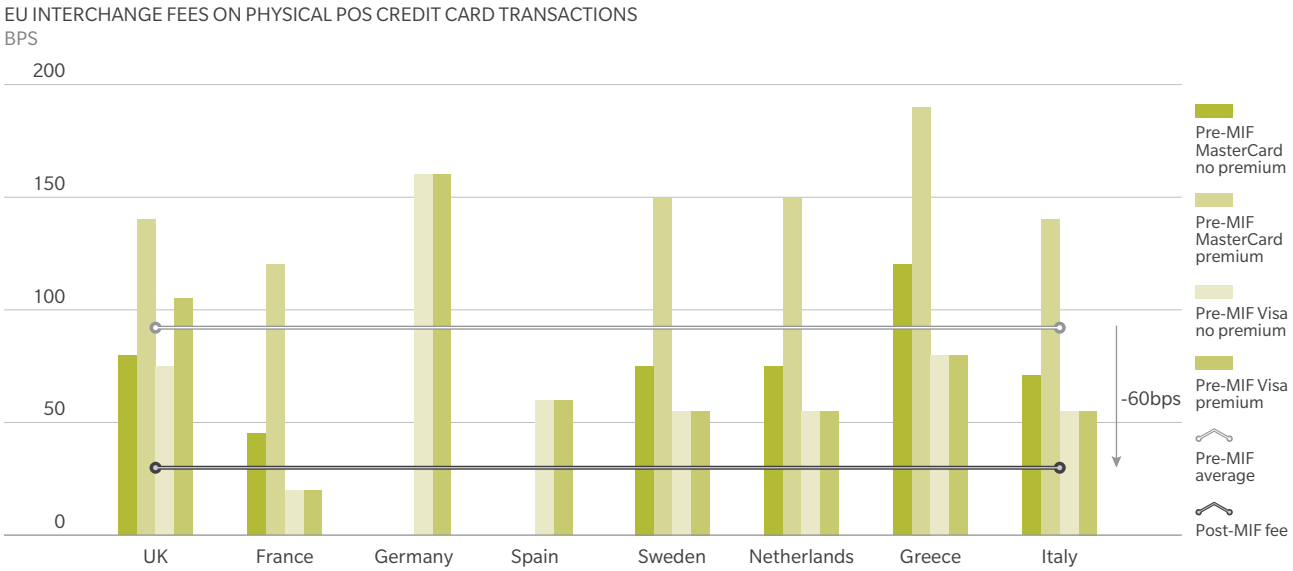
Most account providers in Europe issue customers with a debit card linked to the account. Credit cards are issued in most EU countries by banks or consumer finance companies. For the purpose of this report, we classify the following card products as credit cards: revolving credit cards and charge or deferred debit cards.

Card economics vary significantly across product types and customer segments. However, most issuers receive a combination of interest revenue on outstanding balances, and often charge a variety of fees, which are levied both on a one-off and a per-transaction basis.

Cardholder fees vary widely by geography, proposition (for example: standard, gold, or platinum), and product functionality (for example: balance transfer or revolving credit facilities). In the past, interchange rates also varied significantly by EU market, as shown in Exhibit 5.

However, MIF regulation introduced by the EU in 2015 has since prompted a reduction and harmonisation of interchange fees across Europe, with debit interchange capped at 20 basis points (bps) and credit at 30 bps. Our account provider revenue pools are calculated by using post-MIF interchange rates. The interchange reduction is accounted for in our 2014 revenue pools.

Exhibit 5: Historical interchange fees on credit card transactions



Source: Federal Reserve Bank of Kansas City report 2013; Oliver Wyman analysis

Exhibit 6 provides an overview of the issuer revenue streams we model in our account provider revenue pools.

Exhibit 6: Issuer revenue streams and scope of our revenue pools

ISSUER REVENUE STREAMS	IN SCOPE OF OUR REVENUE POOLS?
Annual cardholder fees	✓
Interchange fees	✓
Other transaction-related fees	✗
One-off fees (including balance transfer, late payment fees, paper statement fees, etc.)	✗
Interest on outstanding balances	✗

ACQUIRER AND NETWORK PROVIDERS

In this report we consider three types of networks:

- Cards
- ATM
- Account to account (A2A)

Within the acquirer and network provider revenue pools, we capture a number of players responsible for providing services and the underlying infrastructure to facilitate these payments. This section gives a summary of their role, revenue streams, and the key recent trends that have impacted their business models.

Cards value chain

The cards value chain provides the underlying infrastructure and services that enable cards transactions to be captured, authorised, processed, and settled. This value chain is typically divided between multiple participants who perform different roles. Exhibit 7 provides an overview of this value chain and the key participants.

The primary sources of revenue for cards schemes are membership fees and volume-based scheme fees that are charged to both issuers and acquirers. Reimbursements and rebates are often extended to the larger issuers or acquirers in order to attract volume to the schemes.

Exhibit 7: Cards network – overview of key participants

		DESCRIPTION	REVENUE STREAMS
	Merchant Amazon, Galeria Kaufhof		
Acquiring services	Acceptance providers Handepay	• Recruit merchants to accept card payments	• Transaction fee • Gateway fee • Terminal rental
	Gateway/Payment Service Provider (PSP) Worldpay, Adyen	• Provide merchant software for transaction capture and routing • Transmit transaction data to the acquirer	• Transaction fee • Gateway fee • Terminal rental
	Acquirer[1] Elavon, Intesa Sanpaolo	• Provide platform to connect merchants to scheme networks and process payments • Responsible for collection of transaction information and settlement • Authorise transactions • Hold deposit accounts for merchants • Underwrite card transaction and hold liability for merchants	• Merchant Service Charge
Processing	Card scheme[2] Visa, Mastercard	• Provide network for transaction routing • Connect and switch transactions between merchant acquirers and card issuers • Invest in marketing card acceptance and their own brand • Determine rules and fees	• Scheme fees
Issuing services	Issuing bank[3] MBNA, Credit Agricole	• Hold contractual agreement with cardholder • Bear credit risk • Able to outsource everything except balance sheet activities	• Interest income on balances • Interchange • Other fees and commissions

1. Acquiring processor if outsourced
2. Scheme processor if outsourced
3. Issuing processor if outsourced

Note: Acceptance providers are active in some EU markets

Source: Oliver Wyman analysis

EU acquiring remains a largely domestic business with different providers operating in each country. The acquirer's principle source of revenue is the merchant service charge (MSC). This charge includes an interchange fee, which is passed on by the acquirer to the issuer. Despite the alignment of interchange rates, MSCs vary significantly across Europe, reflecting the competitive dynamics in each market and the bargaining power of local merchants.

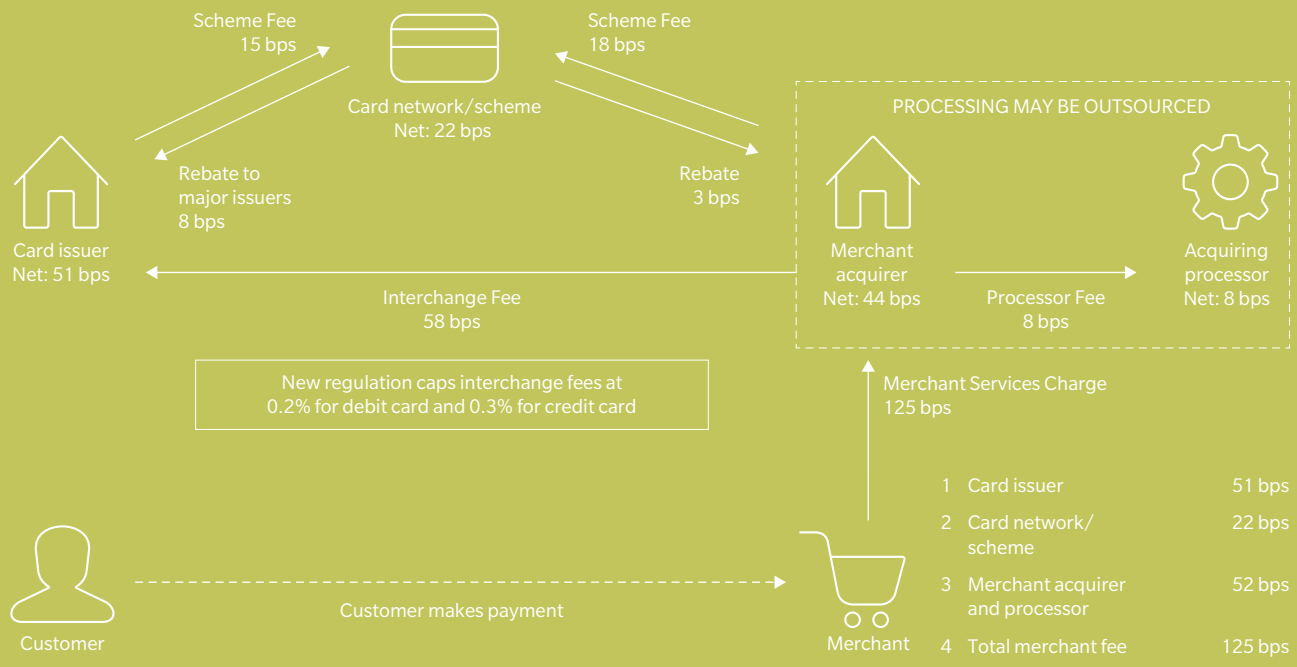
The dynamics of the acquiring market vary significantly between the more price-sensitive large corporate segment and the SME merchant segment:

- The bargaining power of large corporates has driven down the MSC, resulting in low margins for acquirers.
- Acquirers seek to counter by promoting and charging large corporates for value-added services (such as reporting, integrated payment solutions, and customer-facing solutions).
- Acquirers use the large corporate segment primarily to achieve scale and reduce marginal costs.
- Profits are derived from the SME segment, where MSCs are higher and afford a higher margin. Acquirers also charge gateway and terminal fees in this segment.

CARDS NETWORK PARTICIPANTS AND REVENUE MODELS

The diagram below shows a schematic of the participants in a cards network, and an indication of the fees exchanged between these parties. The commercial arrangement between these parties is not very transparent, and varies significantly by geography. As such, we calculate a single aggregate revenue pool for acquirers and network providers.

We model MSCs (net of interchange) adjusted to account for value-added services and point-of-sale (PoS) terminal fees, and include these in our acquirer and network provider revenue pools.



Source: JPM estimates, Oliver Wyman analysis

A2A networks

An A2A network is an interbank network that facilitates account-to-account transactions.

There are two broad categories of A2A payment: direct debit and credit transfers extending now to the SCT Inst scheme for instant payments. Some networks support close to real-time authorisation and settlement. Transactions on other networks are settled overnight, and may take a few working days to clear.

Banks are required to establish a separate body to manage the network and process transactions. Their role often encompasses setting standards and processes across the industry, and using their economies of scale to provide a common infrastructure for authorisation, clearing, and settlement.

Many of these networks are still owned by consortia of major banks in each European market, and operate on a not-for-profit basis (such as Faster Payments (provided by VocaLink, itself acquired by MasterCard), CHAPs, and BACS in the UK). Fees are often levied on a per-transaction basis in order to recover operational costs. We include these fees within our acquirer and network provider revenue pools. In EU countries where these fees are not passed on to the customer, they are subtracted from our account provider revenue pools.

ATM networks

ATM networks provide the physical ATM terminal infrastructure and processing that enable cardholders to make cash withdrawals.

Networks are either bank-owned or independent. A distinction is drawn between "on-us" transactions (i.e., when the terminal owner and issuer are the same entity) and "off-us". Off-us transactions are either made on a network owned by another bank, or by an independent ATM deployer (IAD) or independent service operator (ISO), who manage independent terminal networks. Some interbank schemes have been established to extend the reach of the on-us network. For example, in Sweden, a consortium of the major banks have established a separate company, called Bankomat, to manage the ATM network. The UK network is owned by the banks, but governed by a scheme administered by Link.

On-us transactions across Europe are typically free for the customer, while off-us transactions incur terminal fees, ATM interchange, and/or fees from the issuer, depending on their ownership model.

We include terminal fees only in our acquirer and network provider revenue pools. ATM interchange is assumed to net to zero at the system level, and so does not appear in our account provider pools.

PAYMENTS MARKETS AND HISTORICAL MARKET SIZES

PAYMENTS MARKETS

In spite of recent initiatives to harmonise the payments infrastructure and regulatory regime across Europe (such as SEPA and PSD1), the landscape remains complex and heterogeneous.

In order to rationalise and navigate this complexity, we have grouped the 28 EU member countries into six payments markets after considering the following factors:

1. Geographical proximity
2. Structure and maturity of the branch and electronic payments infrastructure (i.e., credit cards, debit cards, A2A)
3. Historical adoption rates and usage patterns associated with different payments means (e.g., prevalence of cash or other paper-based payments, the penetration of debit and credit cards, preferred e-commerce payment solution)

An output of this assessment and overview of the six payment areas can be seen in Exhibit 8.

We also provide a more detailed cross-comparison in "Historical trends and comparison of EU markets" and identify noteworthy differences in the market structure or usage of different payment means in key geographies.

Exhibit 8: Overview of EU payments markets

		UK & IRELAND	FRANCE & BENELUX	CENTRAL EUROPE	IBERIA & ITALY	NORDICS	OTHER EU[1]
	GDP per capita €'000 pp	54	34	28	23	61	10
Infrastructure	Branch density	Low	Medium	Low	High	Low	Medium
	ATM network density	High	High	Medium	Medium	Low	Medium
	PoS penetration	Medium	Medium	Low	Medium	High	Low
	Card penetration	High	Medium	Medium	Medium	High	Low
Usage	Cash & cheque use	Medium	High	Medium	High	Low	High
	Card use	High	High	Low	Low	High	Low
	A2A use	Medium	Medium	High	Medium	Medium	Medium
	MATURITY	**HIGH/MEDIUM**	**MEDIUM**	**HIGH/MEDIUM**	**MEDIUM/LOW**	**HIGH**	**LOW**

1. Baltics, South East Europe, South Central Europe

Source: ECB Payments Statistics (2014), Oxford Economics 2014 data, Worldpay report Nov 2015, Oliver Wyman analysis

HISTORICAL TRENDS AND COMPARISON OF EU MARKETS

Payment volumes in Europe have grown steadily in recent years, in line with GDP. In 2014, there were approximately 113 billion noncash payments transactions in Europe, the most frequent noncash transaction being debit card spending at PoS.

Noncash payment activity is at its highest, and growing at the greatest rate, in the Nordics, France and Benelux, and the UK and Ireland. These markets have more mature cards networks and higher penetration rates for cards. A2A-based electronic payment solutions have also been successfully deployed in these geographies.

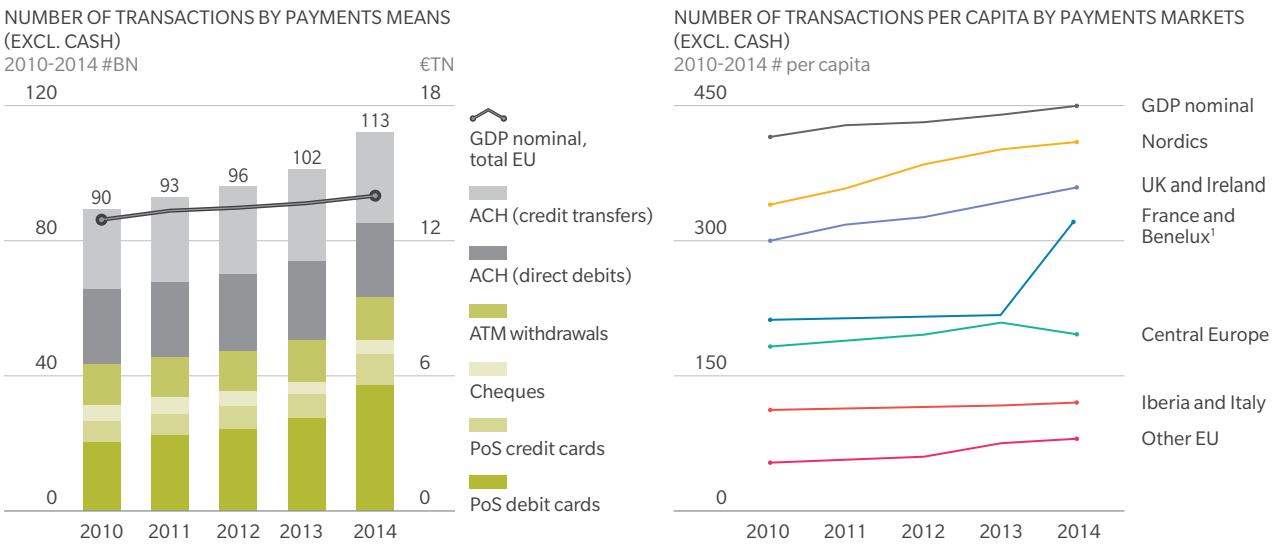
Exhibit 9 shows historical payments activity in Europe by payment means and payments market.

Cash, cheques, and supporting infrastructure

Cash remains a popular payment mechanism across the majority of the EU. The value of cash withdrawn from ATMs is highest in Central Europe, but is still significant in Iberia and Italy, in the UK and Ireland, and in France and Benelux, indicating that many European economies still rely to a considerable extent on cash payments.

Cash withdrawal behaviour at ATMs varies significantly across the different EU payment markets, as shown in Exhibit 10. This is a result of the differences in ATM network densities and the economic models of ATM network providers. A comparison of ATM network densities can be found in Exhibit 11.

Exhibit 9: Overview of historical payments activity across EU markets



1. Figures do not include cards transacton data for France until 2014 due to data limitations of ECB Payments Statistics data set

Source: ECB Payment Statistics, Euromonitor, Oliver Wyman analysis

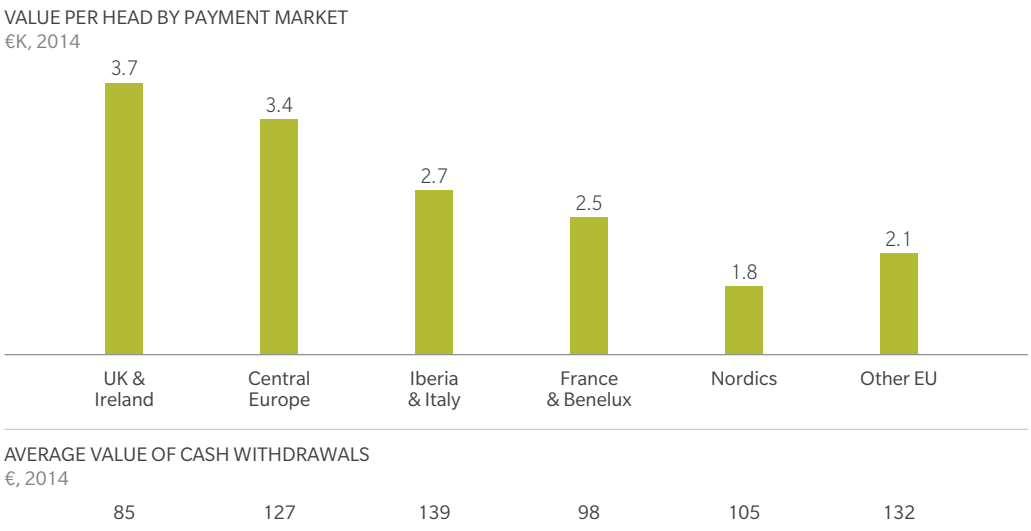
The UK and Ireland have high withdrawal rates and low average withdrawal values. The majority of the ATM network is operated under the LINK scheme and is free at the point of use. Similar interbank ATM schemes have been established in other markets. In Sweden, the Bancomat ATM network is jointly owned by five major banks; no fee is charged to the customer for the use of the shared ATM network.

More complex structures have evolved in other EU payments markets, where customers are more likely to be charged for making withdrawals. As a consequence, the average amount withdrawn is often higher in these markets. In Spain, for example, the major banks have formed three ATM networks: 4B, ServiRed, and 6000. Customers using an ATM on their bank's own network are in some cases charged a modest withdrawal fee of between €0.50 and €1.80, with higher fees for withdrawals made on different networks.

Cheques, generally, are in relative decline throughout the EU. However, they remain a popular payment mechanism in some EU markets. We observe the following trends:

- Cheque usage is high in South Eastern Europe, particularly Greece and Cyprus where they accounted for more than 20 percent of noncash payments by value.
- In Spain and Italy, cheques are still routinely used for large-value payments, such as house purchases.
- In more mature markets, such as the UK and France, there have been concerted efforts[1] by industry and government to phase out and substitute cheques with more modern electronic payment mechanisms, such as A2A transfers. These efforts have achieved varying degrees of success.

Exhibit 10: Cash withdrawals at ATMs



Source: ECB Payment Statistics, Euromonitor, Oliver Wyman analysis

1 For example, in 2008 the UK Payments Council considered the possible closure of cheque clearing by 2018. However, the initiative was abandoned. Nonetheless, cheque usage continues to decline gradually as consumers switch to faster and more convenient A2A based payment methods (e.g., UK FPS). In 2012, the French Ministry of Finance announced an objective to halve the number of cheques issued in France within five years. Development of alternatives to cheque payments remained one of the aims of the national strategy in 2015. And while it is in overall decline, cheque usage remains high in France relative to comparable EU markets.

- The cheque payment mechanism is becoming obsolete in several other European countries, such as the Netherlands, Sweden, and Estonia, due to low rates of merchant acceptance and high cheque-cashing fees by account providers.

Branch network density varies across Europe, as follows:

- The highest density of branches per capita is in Iberia and Italy, where there is a greater dependency on cash and paper-based payment means.
- The lowest density can be found in the UK and Ireland, Central Europe, and the Nordics. Banks in these markets have been able to reduce their branch footprint, in part due to the relatively high penetration of cards and other electronic payments mechanisms.

Cash and cheque use in the EU is under threat with the growing penetration of cards and other more innovative payment means. Authorities in some EU payments markets are also introducing policy measures to encourage the migration to a cashless society. In 2012, for example, the Spanish government enforced a law to impose a limit of €2,500 for cash transactions in order to clamp down on "grey" market activity and combat tax evasion.

Cards markets

The dynamics and maturity of the cards markets differ across Europe. This variation is principally caused by two factors:

Maturity of the underlying infrastructure: the key differences being PoS terminal penetration rates and the technologies available at PoS (e.g., chip and PIN, contactless, magnetic stripe, and signature).

Card penetration rates: these vary from an average of 0.5 cards per head to 2.5 cards per head. There are also different preferences. Debit cards are more popular in some markets, and credit cards are more so in others.

Exhibit 12 provides an overview of how these factors compare across EU payments markets, and juxtaposes these factors with indicators of card usage.

Our main observations on the relevant markets are as follows:

- Card penetration is highest in the UK and Ireland and in the Nordics. Issuers in these markets also achieve the highest total transaction value per card, although the causes are different: high average transaction value (ATV) in the UK and Ireland, as opposed to high frequency and low ATV in the Nordics.
- France and Benelux and Central Europe have comparable penetration rates. However, the PoS network density is greater in France and Benelux, presenting consumers with much greater opportunity to use their cards. As a consequence, France and Benelux has a greater frequency of transactions and a lower ATV.

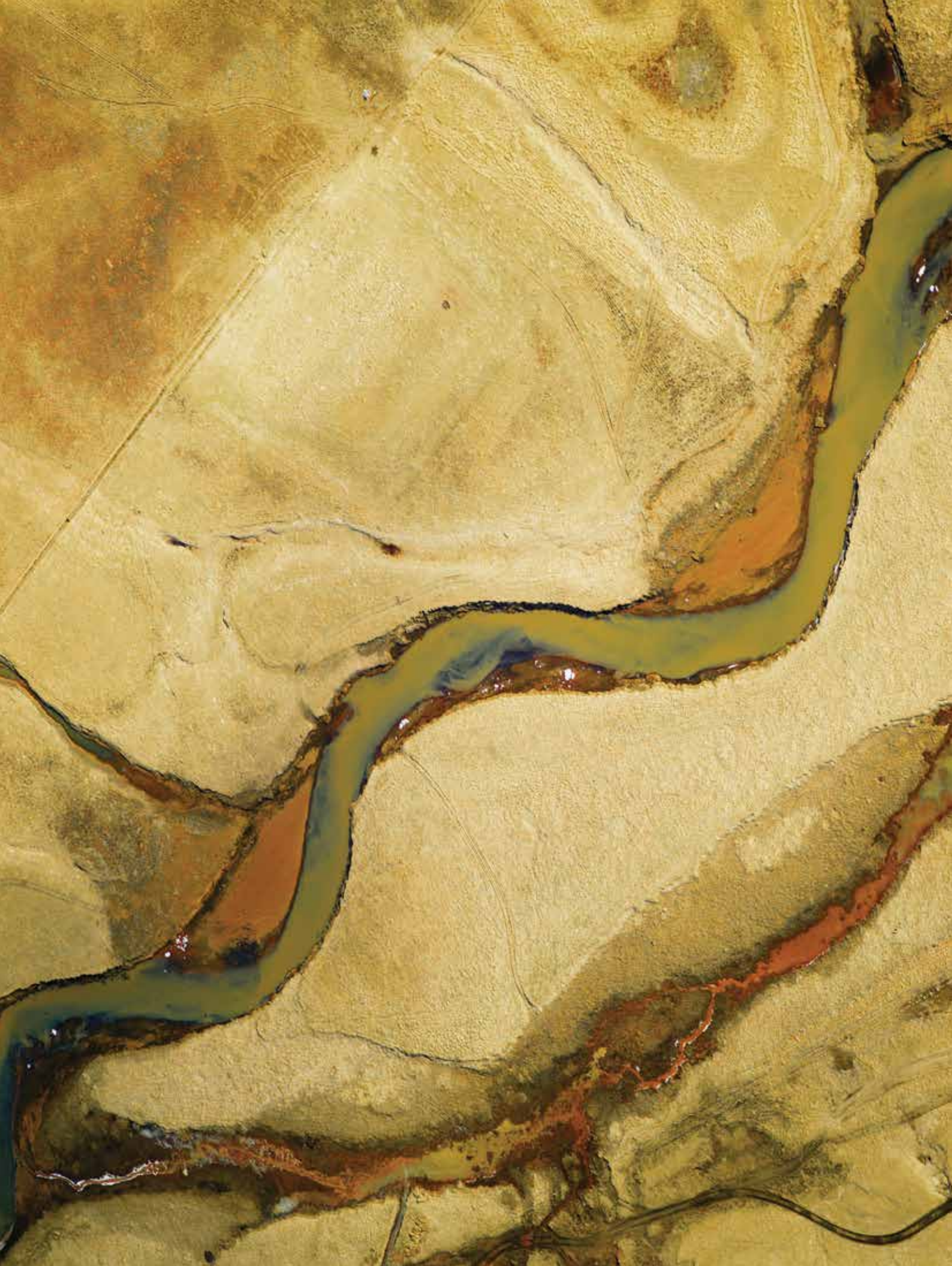
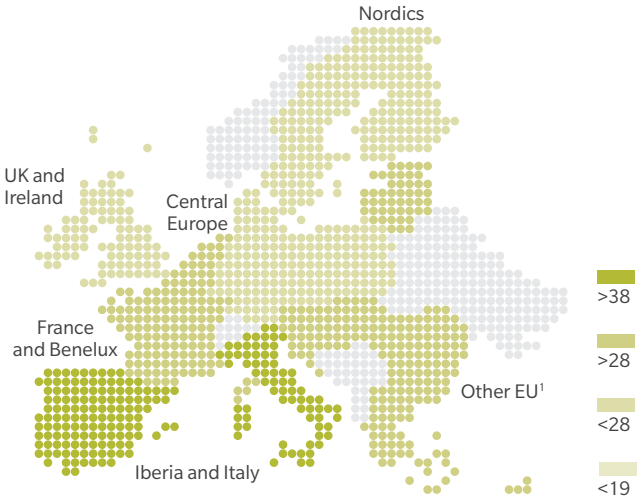
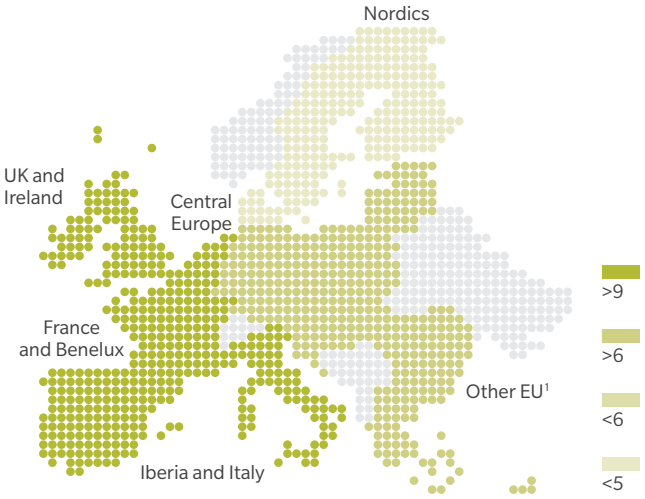


Exhibit 11: ATM and branch network densities by payment market

BRANCH DENSITY
BRANCHES PER 1,000 INHABITANTS, 2014



ATM NETWORK DENSITY
ATMs PER 10,000 INHABITANTS, 2014

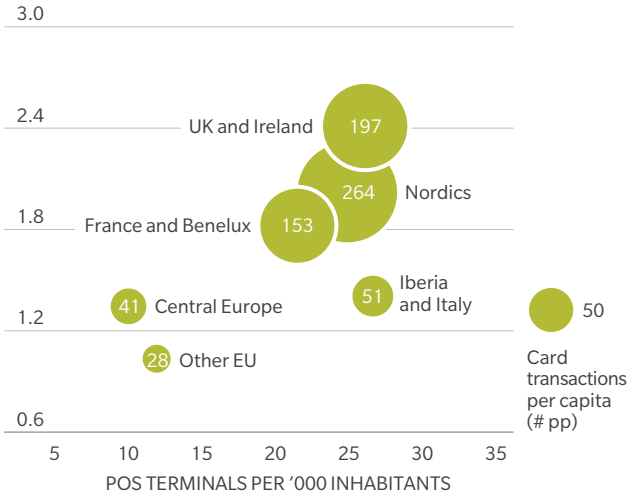


1. Baltics, South East Europe, South Central Europe

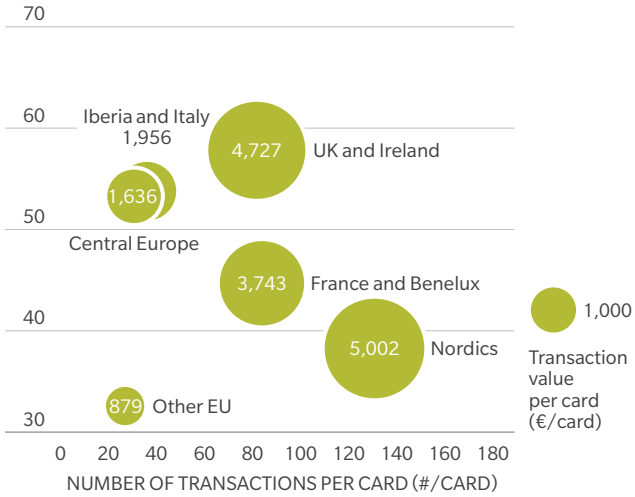
Source: ECB Payments statistics, World Bank, Oliver Wyman analysis

Exhibit 12: Comparison of card network maturity and usage by market

MATURITY OF CARD NETWORK (2014)
NUMBER OF CARDS PER CAPITA (# PP)



CARD USAGE (2014)
AVERAGE TRANSACTION VALUE (ATV) (€/TRANSACTION)

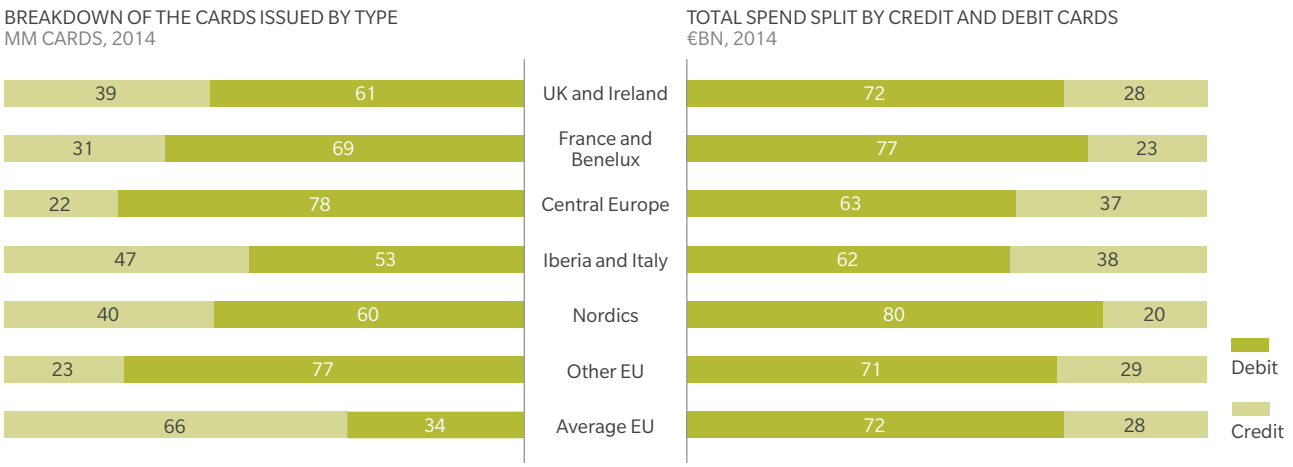


Source: ECB Payments statistics, World Bank, Oliver Wyman analysis

- The acquiring network in Iberia and Italy is relatively mature when benchmarked against other European markets. However, the card penetration rate is lower, and consumers show a greater propensity to make cash payments at PoS.

EU payments markets also differ in their preference for debit versus credit cards. Exhibit 13 shows the number of cards in issue, and total spend split by credit and debit across these markets. In the EU, approximately two-thirds of all cards in issue are debit cards, while more than 70 percent of total card spend is transacted via debit card. The Nordics and France and

Exhibit 13: Market position of debit vs. credit across EU payments markets



Source ECB Payments statistics, Oliver Wyman analysis

Exhibit 14: Case study – national schemes in key EU geographies

	CARTES BANCAIRES, FRANCE	PAGOBANCOMAT, ITALY	DANKORT, DENMARK
Type	4-party	4-party	4-party
Card processing for			
Debit	✓	✓	✓
Credit	✓	✗	✗
Value of card transactions €BN (% total)[1]	212 (40%)	57 (23%)	36 (66%)
e-commerce	✓	✓	✓
Int'l partners	Visa, MasterCard	Maestro, Visa, V PAY	Visa
Comments	• Bank-owned (est. 1967) • Membership comprising all major French banks • Manages national ATM network • Contactless and chip-and-pin enabled • Security: DDA and 3D Secure authorisation	• Debit card network set up by Italian Banking Association (est. 1983) • Now owned by Bancomat Consortium • Members include a major Italian banks, financial intermediaries and payment institutions • Contactless and chip-and-pin enabled	• Set up by a consortium of banks (est. 1983) • Managing company Nets bought out by consortium led by PE firms Advent International and Bain Capital in 2014 • Recently launched IPO (Nets) • Contactless and chip-and-pin enabled

1. CB market share is % of French debit and credit card transactions, Pagobancomat and Dankort are % of Italian/Danish debit card transactions only

Source: Datamonitor statistics 2014; Company websites; news articles; Oliver Wyman analysis

Benelux have the strongest propensity to spend on debit rather than credit cards (more than 75 percent of total card spend). The share of credit card spend is highest in the UK and Ireland, Central Europe, and Iberia. This is a key driver of the high ATV in these markets (see Exhibit 12).

In addition to international schemes, local card schemes also exist in some geographies and have significant market position in several large European markets (seeExhibit 6). These local schemes are typically bank-owned and operated at cost. As a result, they levy significantly lower MSCs, making them more attractive to merchants in comparison with the international schemes. The cards issued are co-branded with international schemes to allow customers to use them abroad.

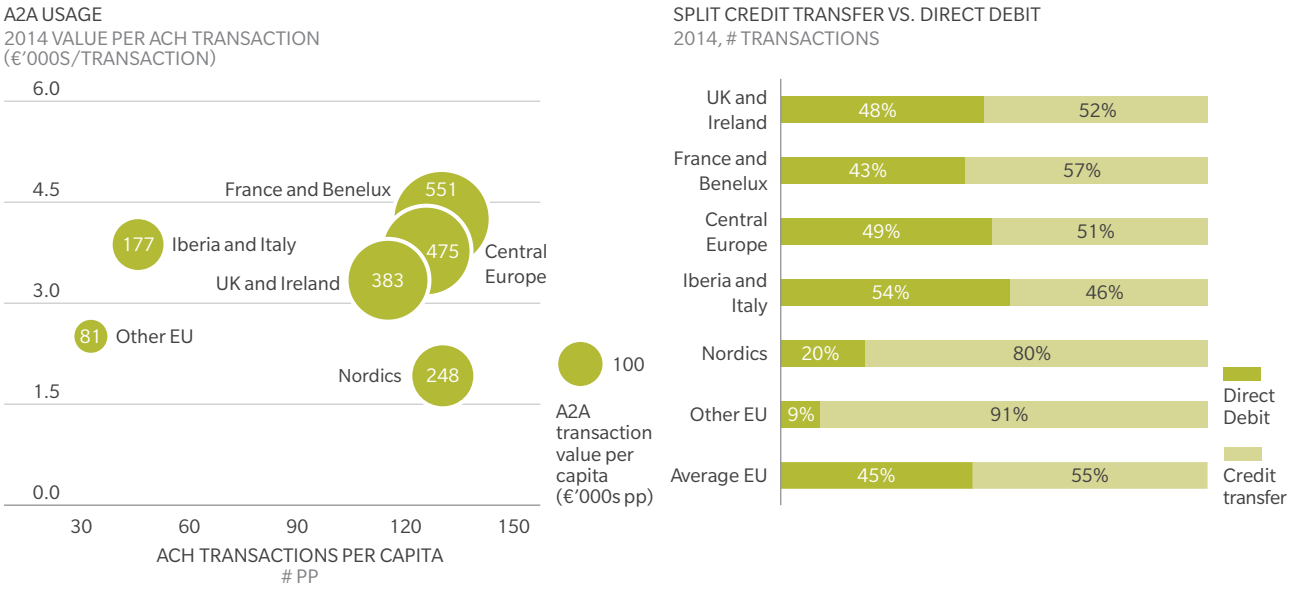
A2A

A2A is becoming an increasing popular payments mechanism in more mature payments markets in Europe.

As shown in Exhibit 15, A2A usage is highest in France and Benelux, Central Europe, the Nordics, and the UK and Ireland. There has been significant investment in the infrastructure in these markets (see "Real-time account-to-account" for details). For example, the A2A network in the UK and Sweden is capable of processing transactions in close to real time.

An average of approximately 45 percent of A2A payments in Europe are credit transfers, with the remainder being direct debits. There are structural differences in how A2A is used in different European markets.

Exhibit 15: A2A usage across European markets



Source: ECB Payments statistics; Oliver Wyman analysis; Note: UK data includes large value CHAPs payments

Credit transfers are particularly prevalent in the Nordics due to the presence of payments services such as Swish, MobilePay, and Vipps, which have proven very popular with consumers (see "Mobile payments and wallets" for more details). Banks and payment network providers (such as Nets) in some Nordic countries also charge corporates some fees for administering direct debits. These charges are typically passed on to consumers. Direct debits ensure a regular cash flow for the corporates, while not incurring any additional costs. This makes direct debit a popular choice in the Nordics.

In Germany, direct debit volumes are far higher due to the ELV scheme. This scheme enables German consumers to authorise a single direct debit for payment of goods at point of sale. This gives the customer increased security of purchase, as direct debits can be revoked and recovered up to eight weeks after settlement. The merchant avoids paying charges on card payments, but assumes exposure to credit and fraud risk. An overview of the ELV scheme is provided in Exhibit 16.

Market sizes

We have estimated the 2014 revenue pools associated with retail and business banking payments in Europe, the definition of which is summarised in Exhibit 19 (for the in-scope revenue streams as per "Market structure, key players, and recent trends").

We estimate that these revenue pools amounted to €37.8 billion in 2014, based on transactions of approximately €190 trillion by value (including cash). An overview of the underlying drivers of these revenue pools can be found in Exhibit 20, and a summary of the underlying transactional activity in Exhibit 18.

Our analysis enables us to break down the total revenue pool in the following ways:

- By payments market (as described in "Payments markets")
- By player type (as described in "Market structure, key players, and recent trends")
- By payment type

These breakdowns are summarised in Exhibit 20.

The underlying dynamics of these revenue pools vary significantly across payments markets. In general, however, they can be attributed to one or more of the following drivers:

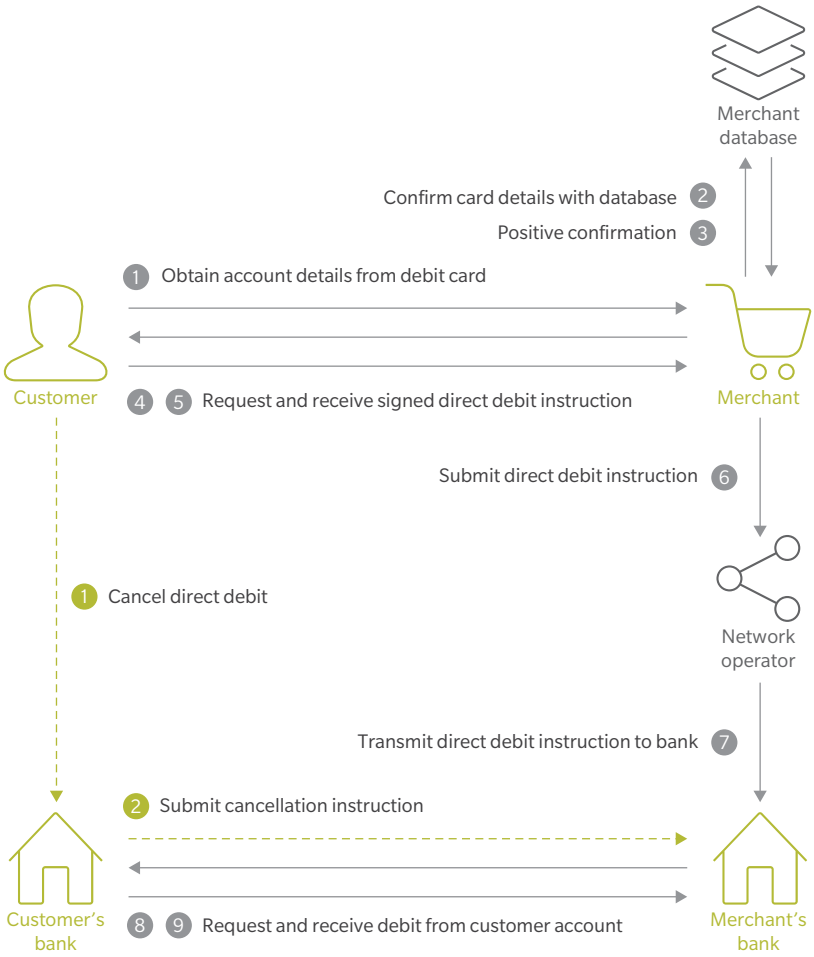
- Card volumes at PoS and preference for debit versus credit.
- Differences in net MSCs and volumes for large corporate and SME merchants.
- Structural differences in PCA/BCA account provider fee structures.

European account providers captured approximately €21.7 billion (57 percent) of this revenue pool, of which €16.4 billion was derived from account fees and cardholder fees and another €5.3 billion from interchange fees on credit and debit transactions.

The remaining €16.1 billion was captured by the acquirers and network providers. MSC (net of interchange fees) were the largest contributor, amounting to €9.3 billion. These revenues were collected by the acquirers and subsequently shared with the cards schemes and processors.

Exhibit 16: Case study: German ELV uses debit card terminals to authorise direct debits

OVERVIEW OF PAYMENT METHOD[1]



SUMMARY

- Account details may be obtained via the magnetic stripe or chip-and-pin on the debit card
- Customer identity checks provided to banks via merchant before payment is processed
- Many merchants have set up their own/shared databases to reject cards based on prior experience of:
  - Insufficient funds to pay direct debits
  - Direct debit permission denied for specific card or merchant
- From Feb 2016 the ELV system has had to adapt in order to process direct debit transactions via the pan-European SEPA system

BENEFITS

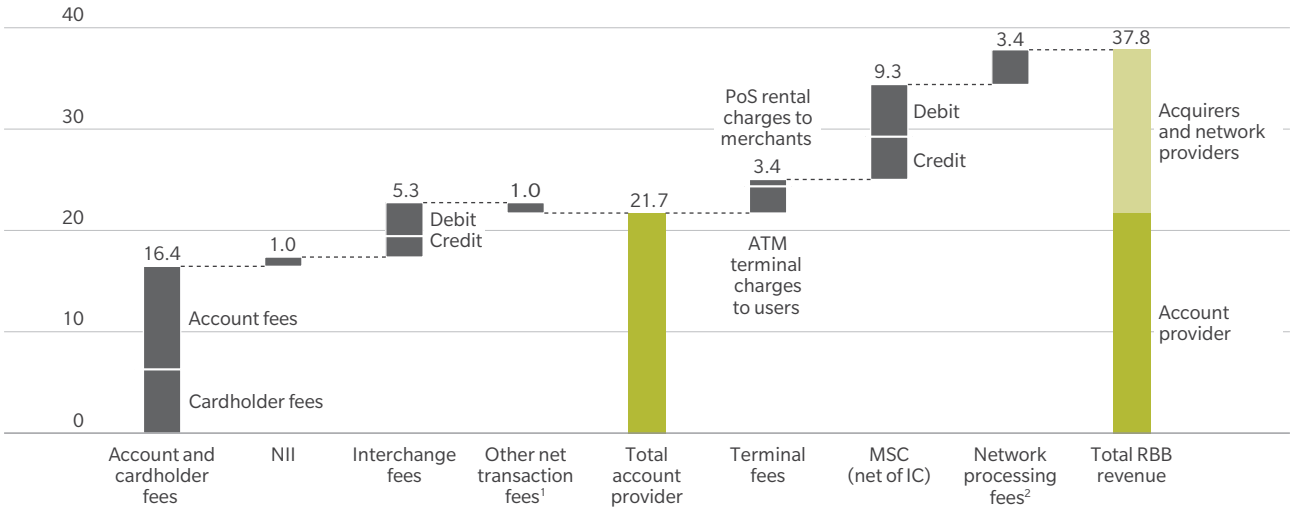
- Increased security for customers as direct debits can be revoked and recovered for up to 8 weeks[2] after settlement
- Prevents overdraft charges/credit card debt as settlement does not occur unless customer account holds sufficient funds
- Fraud and consumer credit risks is assumed by the merchant rather than payment service provider
- Merchant avoids card payment charges

1. Adapted from kartensicherheit.de chart; cancellation procedure is curtailed; system shown here is simplified
2. SEPA regulation

Source: kartensicherheit.de, Handelsverband Deutschland, Oliver Wyman analysis

Exhibit 17: Breakdown of 2014 top-down revenue pool estimates

RETAIL AND SME PAYMENTS REVENUE POOLS BY PLAYERS AND PAYMENT MEANS
2014, €BN



1. Transaction fees charged by PCAs / BCAs net of associated network processing fees. Item includes charges for credit transfers and direct debits, cashing cheques, cash handling fees

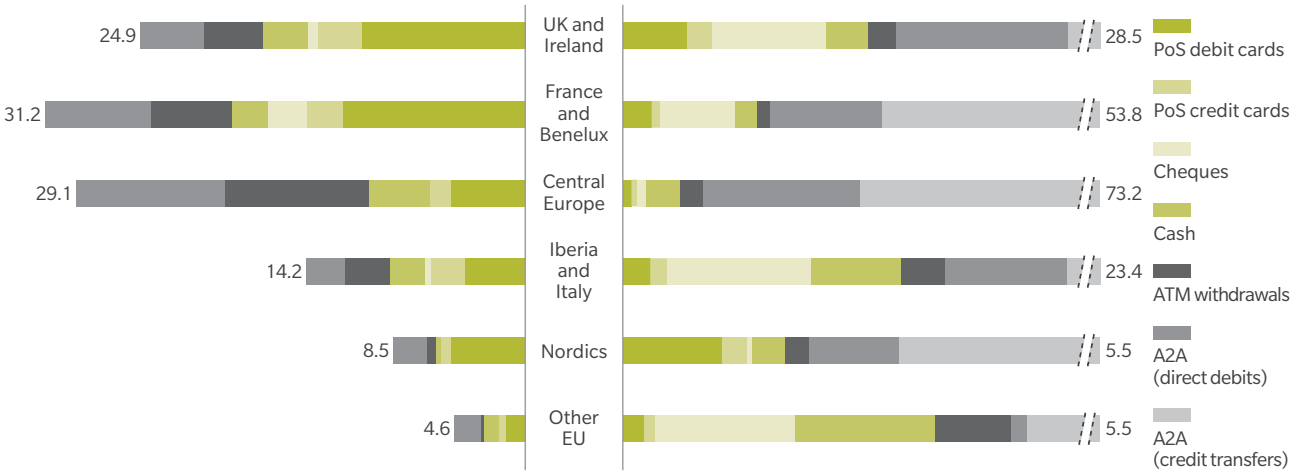
2. Fees charged by the networks to the banks for processing A2A payments and cheques

Source: ECB statistics, Oliver Wyman analysis

Exhibit 18: 2014 market sizes by payment means and EU payment market

OF TRANSACTIONS BY PAYMENT MEANS (EXCL. CASH)
BN, 2014

VALUE OF TRANSACTIONS BY PAYMENT MEANS
€ TN, 2014



1. A2A credit value for UK is adjusted to exclude wholesale volumes

Source: ECB statistics, Oliver Wyman analysis

Exhibit 19: Definition of retail and business banking payments

IN SCOPE

		P2P	P2B/P2M	B2P	B2B
Physical PoS and remote payments	Cash	✓	✓	✓	✓
	Debit cards	✗	✓	✗	✓
	Credit cards	✗	✓	✗	✓
	A2A credit transfers	✓	✓	✓	✓[1]
	A2A direct debit	✗	✓	✗	✓
	Cheque	✓	✓	✓	✓

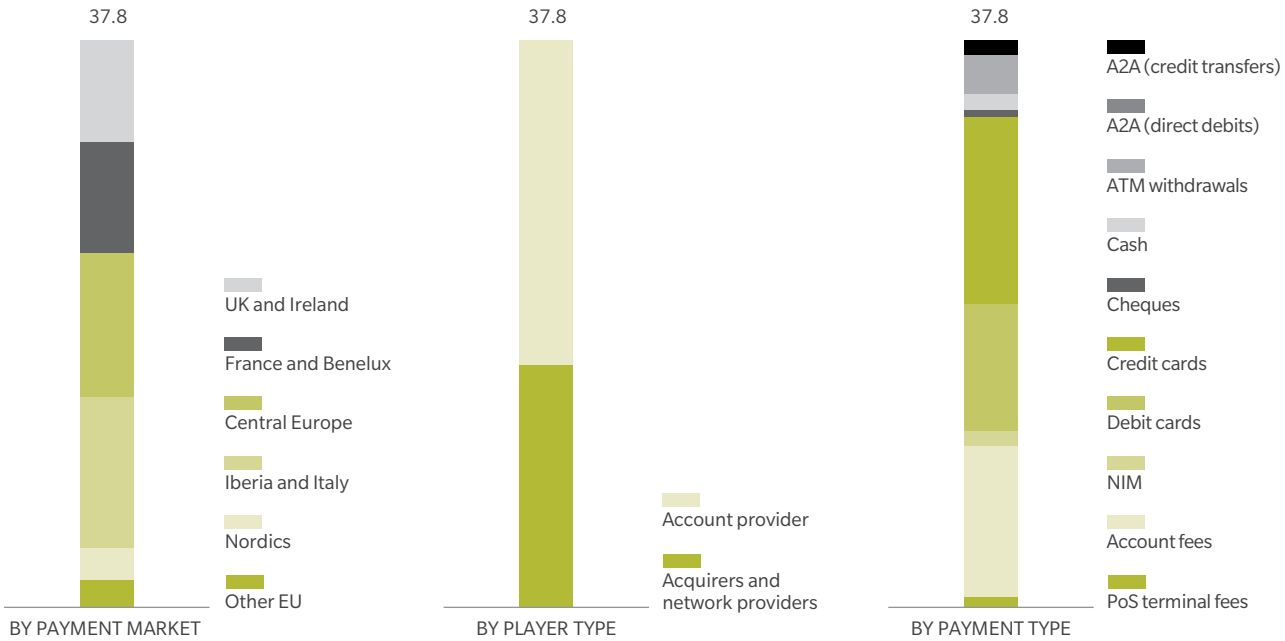
OUT OF SCOPE

- Remittances ✗
- Wholesale and bank-to-bank transfers ✗
- Cross-border payments ✗

1. Excludes wholesale and bank-to-bank transfers

Exhibit 20: Overview of the 2014 retail and SME payments revenue pools

RETAIL PAYMENTS REVENUE POOLS
2014, €BN



Source: ECB statistics, Oliver Wyman analysis

DISRUPTIVE TRENDS

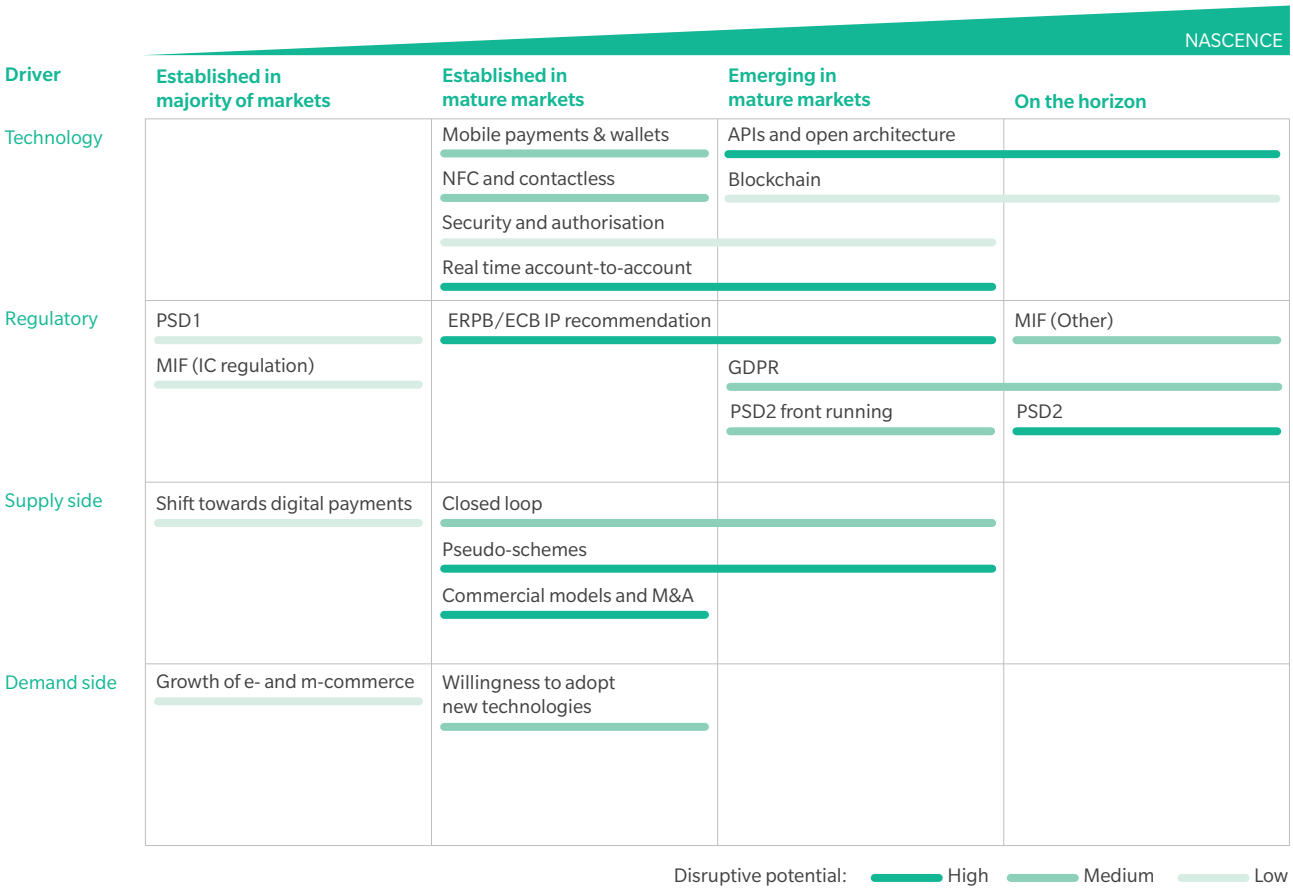
The European payments landscape is more dynamic than ever with technology and regulation simultaneously reshaping supply and demand.

In Exhibit 21, we show key trends that have been identified within these drivers of change. Some of these trends are established in more mature markets. One example is the uptake of near field communication-enabled (NFC) contactless payments at PoS. Other trends are more nascent, but potentially highly disruptive.

Against this backdrop, we also see a shift in the ownership and business models of key participants in the payments ecosystem and underlying infrastructure.

We describe these trends and their implications in more detail in the next sub-sections of the report.

Exhibit 21: Trends, level of maturity, and disruptive potential



Source: Oliver Wyman analysis

TECHNOLOGY

MOBILE PAYMENTS AND WALLETS

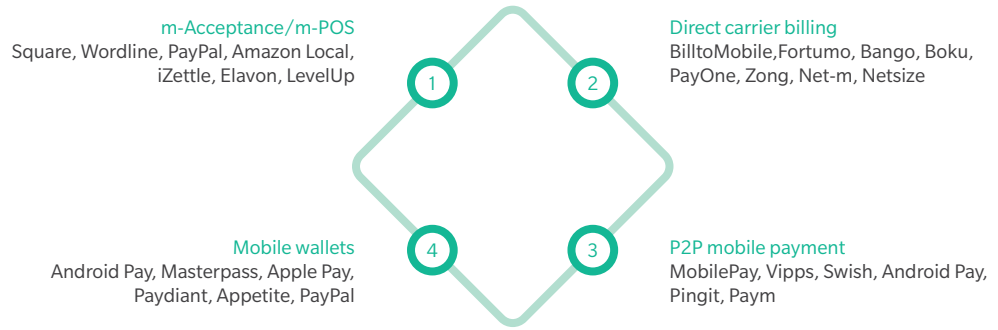
The mobile payments market is dynamic and evolving quickly, with technologies such as host card emulation (HCE) and tokenisation (supported by tech giants such as Apple, Google, and Samsung). The market has also seen a wave of new entrants, resulting in high levels of innovation but also leading to high degrees of fragmentation in the sector.

Different types of service providers are emerging, ranging from fintech mobile acquirers targeting microbusinesses, to mobile wallets (m-wallets) that are being promoted to customers of technology giants such as Apple and Google. Exhibit 22 providers an overview of the mobile payments landscape.

- Mobile acceptance solutions such as Square, iZettle, are extending the reach of cards payments to micro businesses and sole traders, offering a low-cost infrastructure and single transparent pricing structure.
- Direct carrier billing, where payments are processed by the mobile network operator, has emerged as an alternative payment method to cards in a variety of online or mobile environments. In 2012, the four leading Swedish mobile phone carriers[3] accounting for 97 percent of users launched MyWallet, an NFC-enabled m-wallet service. Users are able to transfer funds to other network customers (through direct carrier billing), make m-commerce transactions, and pay via SMS for services such as public transport.

Exhibit 22: Overview of the mobile payments landscape

MOBILE PAYMENTS LANDSCAPE



Source: Oliver Wyman analysis

3 Telia, Tele2, Telenor and Three

- Technology giants such as Google, Android, Samsung, and Apple have launched their own m-wallet propositions, mostly through "card virtualisation" and using tokenisation as the secure mechanism for transaction enablement (see "Security and authentication" for a description of tokenisation).
- Banks are also entering the mobile payments space with the offer of convenience and security. By offering customers the opportunity to link their bank account details to their mobile number, they remove the need for the exchange of sensitive information such as card numbers, sort codes, or account details. Transactions are initiated and authorised in bank-owned smartphone apps and executed via A2A rails.
- Bank-owned mobile payments offerings such as MobilePay and Vipps are also hugely successful (although currently in the P2P market, they are also looking to expand into P2B). In December 2012, a consortium of six Swedish banks[4] launched a mobile payments app called Swish that enables customers to make account-to-account payments using a mobile number. Swish is predominately used for P2P payments and is moving into mPOS and eComm. However, the company has also launched an mPoS solution to rival iZettle, and has announced plans to enter the ecommerce space, putting the consortium in direct competition with Klarna.
- In April 2014, the UK Payment Council launched a mobile payment system Paym, operating mainly as a P2P solution. The difference with solutions like Swish is that there is one app for the whole market in Sweden, while in the UK each bank has integrated the solution into existing apps. To date, the Paym platform has more than three million registered users[5] and is supported by 17 banks and building societies, although transaction numbers are still low. Bizum is the latest arrival in this space, launched by a consortium of major Spanish banks.

Innovation in the mobile payments sector is helping to redefine the user experience around P2P and, increasingly, P2B payments.

While the sector has experienced rapid growth, overall volumes remain small in comparison to more established payment means. We expect mobile payments to continue to grow at historical rates over the medium term. However, we do not expect this activity to have a highly disruptive effect on established players. Indeed, the highest number of transactions can be found in the P2M area (merchant payments), which will not be significantly affected by mobile until HCE solutions by banks and the continuous development of x-Pay solutions reach fruition. Growth has also been driven from niches that are either untouched by the established players, because they are unprofitable or challenging to serve, or because the service as a standalone is difficult to monetise.

- For example, while we expect mPoS providers to continue to grow penetration in the micro-merchant segment, it will be more challenging for them to replace incumbent acquirers and establish market position in the highly profitable SME segment.
- Businesses in the SME segment are typically more mature, and contribute more value to the incumbents' proposition (e.g. value added services and more robust PoS infrastructure).

4 Danske Bank, Handelsbanken, Länsförsäkringer Bank, Nordea, SEB, and Swedbank

5 Paym website. June 2016

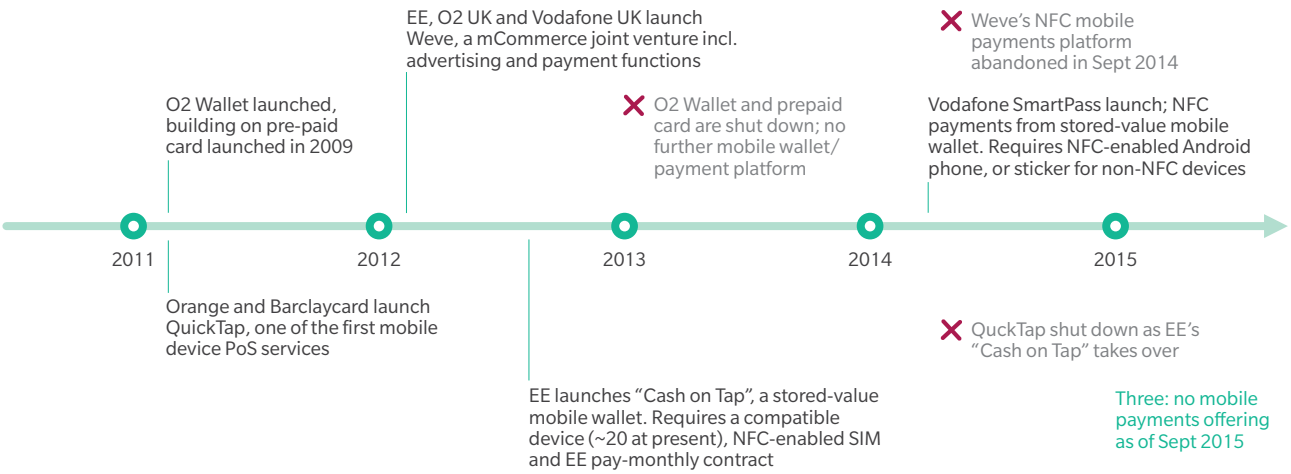
We expect m-wallet propositions to continue to grow in popularity with consumers. This will particularly be the case if m-wallet providers successfully introduce a PISP proposition under PSD2 (see "PSD2").

While the allure of the associated revenue streams is likely to remain strong for mobile network operators, attempts to establish an alternative rail and channel payment volumes through direct carrier billing have met with limited success. Many projects have been abandoned in mature markets (see Exhibit 23). We also note that the majority of payment activity on the more successful m-wallet propositions offered by banks and technology giants is routed through established networks and infrastructure (A2A networks or cards networks).

Overall, the real uptake of m-payment solutions will most likely only happen if a combination of P2P, instant bill payment, and other value-added services (i.e., loyalty rewards) are integrated into m-wallets. An "all-in wallet" proposition like that would offer real additional value to the consumer, in comparison to plastic.

This change might happen when existing market players, such as the technology giants, launch their upgraded wallet solutions, enabled by regulations, such as PSD2. In this scenario, the banking sector will have to align and launch a competing proposition in order to remain visible in the market. An all-in wallet would also serve to strengthen their consumer relationship and avoid disintermediation. The risk is that larger tech players such as Facebook Messenger launch integrated payments and take the lead.

Exhibit 23: Mobile Network Providers have tried different approaches to launch mobile



Source: Oliver Wyman analysis

CONTACTLESS

Contactless payment infrastructure has been introduced in many of the more mature cards markets in Europe. This technology has the potential to revolutionise card usage, repositioning card payments to consumers as a convenient way to conduct low-value transactions and offering a credible digital alternative to cash.

Contactless payments are enabled by NFC chips that are typically embedded in physical credit or debit cards, but increasingly also in wearable devices, smartphones, and other devices. These chips enable information to be read and transactions to be authorised at contactless PoS terminals without the need for PIN number authentication. The value of transactions is typically capped to manage exposure to fraud losses. Caps vary by country, but were increased in the UK to between £20 and £30 in September 2015, and are set between €25 and €30 in most Eurozone countries.

Contactless has proven to be a popular technology with consumers, with expenditure growing as the infrastructure is rolled out. More than 1 billion contactless transactions were made on Visa Europe cards in the 12 months to July 2015.[6] The value of this spend has also increased threefold[6] over a similar period.

The UK is the leading adopter of contactless payments in Europe, and spending continues to gather momentum as the PoS infrastructure develops.

This growth has been accelerated by the rollout of contactless payments on the Transport for London (TFL) infrastructure, which supported 180 million journeys in the 12 months following its launch in September 2014. TFL transactions represented one-in-seven transactions over the period[7] and have served to reduce average transaction value, while showing their potential to effectively replace cash payments.

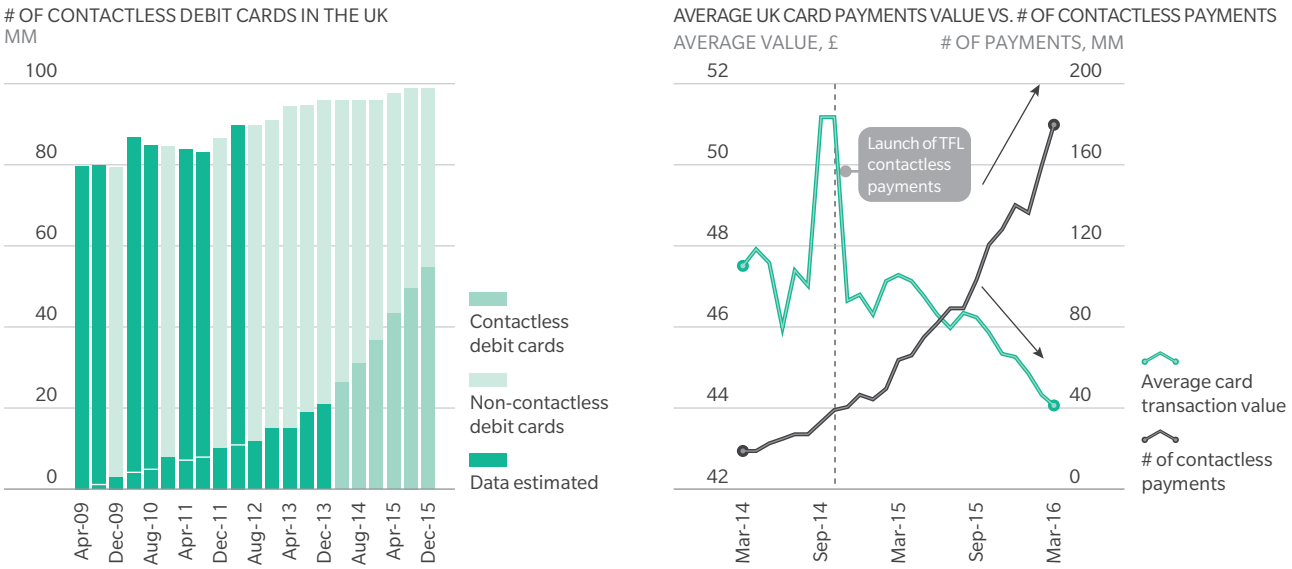
The two international cards schemes, Visa Europe and MasterCard, have invested heavily in NFC and other contactless technologies in an attempt to protect and increase volume through their networks. In order to establish market position in the UK, Visa Europe extended subsidies to both large issuers and acquirers to support reissuance of NFC-enabled cards and increase contactless PoS terminal penetration. They also launched a marketing campaign linked to the 2012 Summer Olympics in London to raise the profile of the new technology among consumers.

We expect continued investment in contactless payment technologies from the two schemes, particularly in less mature cards markets where cash spend is prevalent. We expect this to be highly disruptive and to drive up overall transaction volumes and spend per card across credit, and particularly debit cards. Continued substitution of cash by debit is also anticipated for smaller value transactions, increasing debit transaction volumes and reducing ATVs.

6 Source: Visa Europe estimate July 2015

7 Source: Transport for London press release, Sept 2015

Exhibit 24: Contactless payment card penetration and trends on spend (UK case study)



Source: UK Cards Association, Oliver Wyman analysis

SECURITY AND AUTHENTICATION

The networks and acquirers are investing to make card payments more secure and reduce losses due to fraudulent activity.

Chip and PIN technology has been introduced in most European markets and has been successful in combatting losses from fraudulent and counterfeit activity at PoS. For example, the Cards Association estimates that this technology has contributed to a 63 percent reduction in counterfeit fraud, 48 percent reduction in lost and stolen fraud, and an 86 percent reduction in non-receipt card fraud[8] in the UK since 2004.

Biometric technology is being touted as the next weapon in the battle against fraudulent activity. For example, Worldpay announced that they are piloting the use of facial recognition technology to verify a customer's identify at PoS. Worldpay is also considering integrating face recognition technology into online payment systems via webcam. Nevertheless, the adoption of biometrics is still nascent and is progressing slowly, with no single solution emerging as a winner or the consumer choice.

There is also an increasing use of tokenisation, a secure method of data transmission, in order to improve security of transactions and improve consumer confidence in mobile payments and in using their cards online. This technology removes the need for the customer to pass their card or account details to a retailer when making a transaction. Instead, a token is generated and exchanged when the transaction is processed, and is used by the banks to verify and authorise the transaction. No sensitive data is exchanged or processed by the merchant or acquirer during the transaction itself, and any tokens intercepted by hackers are restricted.

8 UK Cards Association - 10 Years of Chip & Pin: 2006-2016

Biometric technology and tokenisation are two examples of how the card payments industry is investing to improve security and increase consumer confidence. As awareness among consumers improves, we expect this investment to lead to greater adoption of cards payments online, and to support the growth in mobile payments.

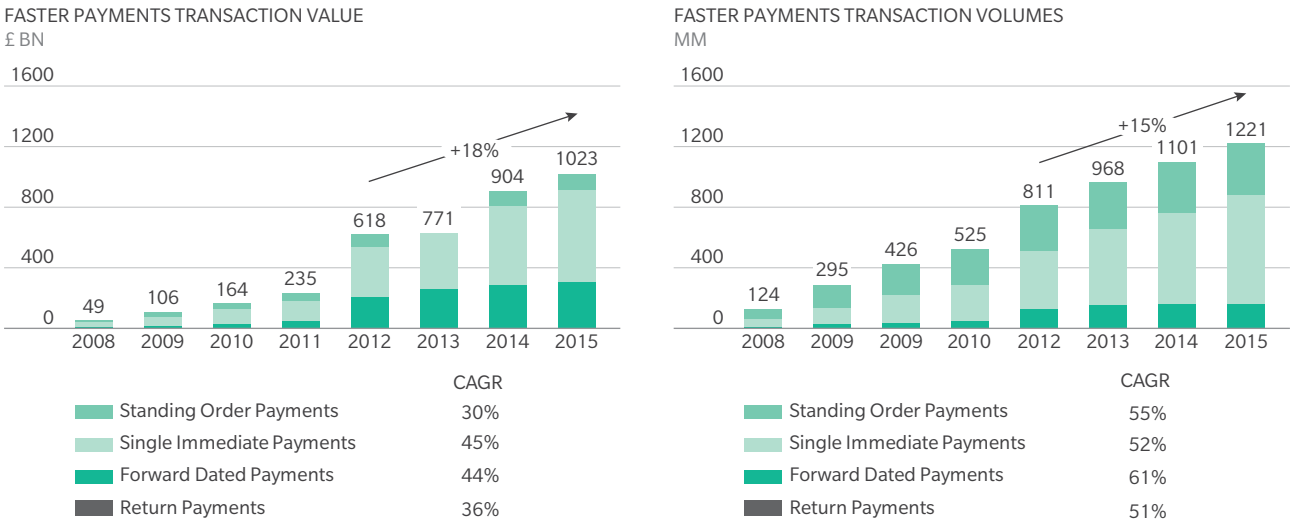
REAL-TIME ACCOUNT-TO-ACCOUNT

Account-to-account payments are becoming increasingly accessible and popular among customers in more mature payments markets due to the proliferation of online and mobile banking, and investment in the real-time interbank A2A infrastructure.

Throughout Europe, there is an ambition to make all accounts reachable for instant payments, and infrastructure developments are underway. This should ensure full reachability of instant payments, at least at the receiving end. Providers such as Nets have developed real-time infrastructure in Denmark; Bankgirot has developed a real-time payment platform in Sweden; and Sia is developing a pan-European real-time network. These companies are all showcasing the rise of real-time payments usage.

Faster Payments Service, launched in the UK in 2008, enables customers to initiate one-off payments from their online banking account or through mobile applications 24/7. Transactions are settled in near real time, with confirmations provided within 15 seconds and funds typically made available in the receiver's account within two hours. This service has proven to be popular with customers, with transaction volumes growing at an average of 15 percent per annum from 2012 to 2015, driven by single immediate payments (SIPs). However, the growth was also a result of BACS substitution, given the long settlement times (of up to three days).

Exhibit 25: UK case study – adoption of faster payments



We expect growth in Faster Payments use to continue following the increase in value limit per transaction to £250 K in November '15

Source: Faster Payments statistics, Oliver Wyman analysis

Fintechs are also playing a role in the real-time account-to-account payment infrastructure ecosystem. Dwolla has built an A2A network that connects US banks and credit unions, enabling secure real-time transfers between these institutions. Dwolla's API infrastructure also enables businesses and developers to access the network and integrate A2A payments into their own platforms. Bizum is an attempt by the Spanish banks to develop a real-time A2A-driven mobile payments solution. Other notable examples in Europe include A2A rail-based e-commerce payment solutions, such as Trustly and Sofort.

Many infrastructure solutions are under development all over Europe (including EBA, STET, SIBS, and NL). However, banks are not consistently investing in upgrading their own internal systems in all markets. Such investment would support Instant Payment (IP) execution and enable banks to exploit their market position and develop new IP-based value propositions for their clients. The success of Faster Payments and Swish show that interbank initiatives can be highly popular with customers. Without such investment, banks run the risk that fintechs will establish a better market position on IP with corporates, merchants, and retail customers.

We believe that the A2A payments will become increasingly disruptive as real-time payment capabilities are rolled out, and the infrastructure and surrounding ecosystem matures. Adoption is growing quickly in markets where the infrastructure is established (such as Sweden and the UK). In these markets, A2A payments are already causing the ultimate demise of cheques. We expect this trend to continue, particularly in the UK for example, when Faster Payments Service limits are increased. Similar trends are expected in other EU markets as closer to real-time A2A payment services are introduced.

Exhibit 26: Comparison of A2A-based e-commerce solutions

	MOBILEPAY	TRUSTLY	SOFORT
Transactions	~90 MM p.a.	~12 MM p.a.	~24 MM p.a.
Ownership	Bank owned	Privately owned	Privately owned (Klarna Group)
Countries	Denmark	Pan-EU (20 countries)	Major EU geographies
Channel	Online/Mobile/Physical	Online/Mobile	Online/Mobile
P2P	✓	✓	✗
B2C	✓	✓	✓
Merchant pricing model	• Not publically available	• Per transaction (%)	• Installation fees • Per transaction (% + €)
Features	• Pay using MobilePay in store • Leverages banks own online banking security and authentication protocols • No chargeback risk • Receive and store receipts directly in app (free of paper receipts)	• Leverages banks own online banking security and authentication protocols • No chargeback risk • Single merchant agreement; integrated reconciliation; mobile ready • Recovery of transactions denied due to credit or debit limits	• No virtual account or registration (uses own online banking details) • Leverages banks own online banking security and authorisation protocols • Confirmation code provided by bank • Real-time confirmation to merchant • No chargeback risk

Source: Company websites, Oliver Wyman analysis

Disruption is likely to be accelerated if regulatory interventions and technological initiatives around APIs and open architecture align to deliver the open banking vision. Such an initiative has already been undertaken by the Competition and Markets Authority (CMA), which has mandated an implementation entity to drive the delivery of open banking in the market. This would allow the real-time A2A infrastructure to support an ecosystem of market participants (fintechs, tech companies, payments companies, banks, and others), providing alternative P2P and P2B payment solutions to compete with the cards schemes. Debit and cash volumes are likely to be most impacted if this were to occur.

Last but not least, the international card schemes will be affected by IP since these are not card-based anymore. Visa and MasterCard are trying therefore to position themselves in this area. MasterCard just bought Vocalink which bring them into the field of A2A transactions, and Visa has developed services like VisaDirect. This is part of their overall strategy to become digital brands.

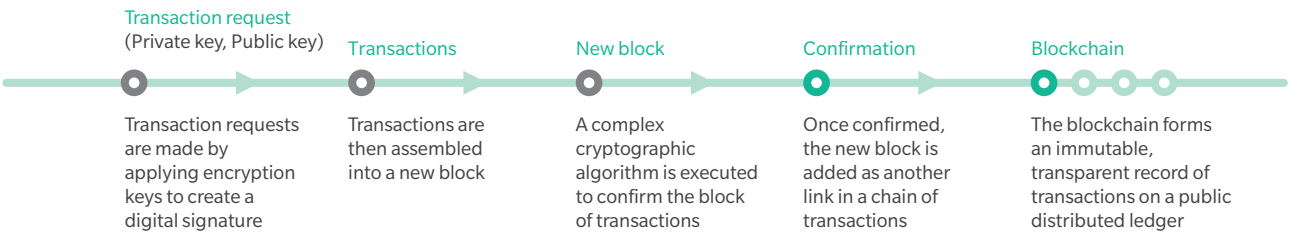
BLOCKCHAIN

Blockchain, or distributed ledger, is the underlying technology enabling a range of new digital currencies, or cryptocurrencies, of which Bitcoin is the most known. Invented by the mysterious Satoshi Nakomoto in 2008 as a peer-to-peer e-currency system, the underlying technology has largely displaced Bitcoin as the target of significant interest and investment by the traditional financial services sector.

Blockchain was specifically designed to enable trustless electronic transactions between two parties, without relying on a central authority for verification. The technology uses strong cryptography, a distributed network architecture, and a concept called "proof of work" to authenticate transactions almost instantaneously. The technology promises low-cost financial transactions and near real-time settlement. Exhibit 27 below provides a brief description of how the technology works.

While the interest in blockchain technology has been unprecedented, it is not likely to have a meaningful role to play in retail payments in Europe in the near future. Most of the benefits offered, or claimed, by digital currencies like Bitcoin, or the underlying blockchain technology, are inconsequential or irrelevant to the current payments landscape.

Exhibit 27: Blockchain – How it works



Source: Oliver Wyman analysis

BENEFIT	CLAIMS	IMPACT ON EUROPEAN RETAIL PAYMENTS	
Real-time	Automatic, near-real time (~10 minutes) settlement of payments is the standard achieved by Bitcoin Other implementations have made improvements that speed up but compromise other features (e.g., decentralisation)	A number of European markets already developing Instant Payments infrastructure	L
Decentralised	The technology is specifically designed to obviate the need for a central overseer and arbiter of financial transactions (hence the "distributed" in distributed ledger)	While there is a wide spectrum of views on whether to allow digital currencies, national regulators are universal in their insistence on close supervision and control	L
Transparent	All transactions are visible on the blockchain distributed ledger, hence providing transparency for all payment flows	Full transparency of payment flows would certainly make anti-money laundering/counter-terrorism efforts easier However, it is doubtful users would accept full visibility and transparency of their payments	M
Legacy system simplification	Blockchain technology is arguably much simpler and more flexible than the current payments infrastructure	Most payments systems are already fully depreciated, thus there is little financial benefit to incentivise incumbent market participants to switch	L

Indeed, we have begun to see early blockchain startups pivot their offerings to focus less on the underlying technology and more on solving specific industry challenges (such as Ripple's shift towards standardising and enriching cross-border payment messages). International transactions outside Europe appear as the most attractive use case, since these transactions are still time-consuming. They involve cumbersome correspondent banking or movement through international money transfer companies, and entail high fees. In this context, a bank-owned, permissioned blockchain-based solution could reduce costs, and would greatly improve the process and shorten the execution delays. Banks could offer these services to their corporate and private clients, while also integrating currency conversion (from virtual currencies to fiat).

The other area that will most likely be affected in the mid-to-long term is clearing and settlement. CSM infrastructures are currently functioning well, and support the execution of billions of transactions, with many of them now even catering for immediate payments. They are also mostly cost-effective. However, any future investments, especially for enabling international transactions, could be based on blockchain technology, which would be cheaper than current platforms and easier to implement.

OPEN APIs

APIs (short for application programming interfaces) are routines, protocols, and tools that define communications between system applications. APIs have been around for a long time and allow for automatic data exchange (i.e., with no human input) and direct communication between applications. Historically, they have been primarily used for internal systems integration – communications between systems operated by the same entity, such as APIs for communicating between a teller application and core banking system. But in the past few years, APIs have become ubiquitous as the de facto standard for data sharing between enterprises, rather than just within them. The concept of open APIs has enabled organisations with large amounts of data to become platforms for third-party innovation, and has created whole new business models across industries.

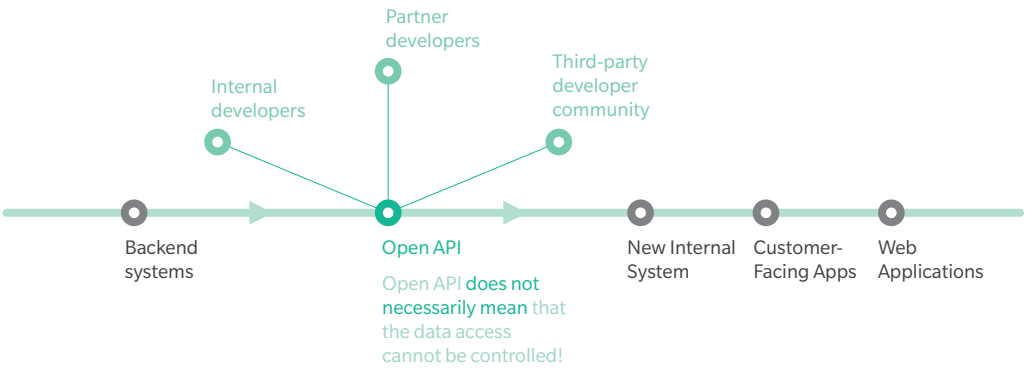
Broadly speaking, APIs enable a number of benefits. By providing open APIs and giving third-party providers access to core data and systems, an organisation can outsource research and development to more agile organisations that are able to innovate more quickly. There are a variety of potential monetisation avenues. Companies can extend their distribution reach by connecting with third-party channels, or they can charge for usage of their APIs. At the same time, APIs reduce internal system complexity by providing a standard integration model, resulting in a highly scalable platform for building new services.

Open APIs have already disrupted numerous markets. Expedia Affiliate Network generates around 90 percent of its revenues through its open APIs; Salesforce.com generates 40 percent. IBM has grown its Watson ecosystem to 350 partners, and is currently commercialising products and services from Watson open APIs. Walgreens, a nationwide US drugstore, has grown the mobile segment of its digital traffic from 1 percent in 2009 to 60 percent in 2014, due to API implementation. Fidor Bank has built a platform based on open APIs, which has allowed it to exploit scale economies and deliver banking services at a fraction of the IT cost of traditional banks. We expect similar disruption in payments and banking, falling into three categories:

- **New products and services:** Easy access to customer data will drive innovation from traditional financial services providers and fintechs, creating new products and services such as the next generation of product-comparison services. This will generate new revenue opportunities for banks, including commercialisation of internal security systems.
- **Increased competition:** Greater price competition will be driven by growth in aggregator usage and customer value transparency. There will be an increase in the number of market participants due to lower barriers to entry and new nonregulated service providers. Further disintermediation of bank-customer relationships will be triggered by growth in usage of comparison sites and aggregators. And a more informed and engaged customer base is likely to become increasingly comfortable with switching providers.
- **Cost reductions:** Automated API data gathering will enable large-scale E2E (end-to-end) process automation in banks. Standardised data frameworks and interactions could, over time, make outsourcing in banking easier and more economic.

Uptake and adoption of APIs and common standards will be fundamental enablers for PSD2 and the payment initiation services and account aggregation services it engenders.

Exhibit 28: Open APIs



Source: Oliver Wyman analysis

REGULATION

The regulatory landscape governing payments in Europe is changing radically to support the EU regulators' vision for a Single European Payments Area (SEPA). The goal is to create a more integrated market where individuals, businesses, and public authorities can send and receive payments under the same basic conditions, rights, and obligations, regardless of their location. PSD1, MIF, and the recent approval of PSD2 are important stepping-stones towards this vision.

Through initiatives such as GDPR, the EU is also looking to harmonise standards and protocols for data sharing in a bid to create a more open data environment, and remove some of the barriers to competition for new entrants.

In the context and backdrop of PSD2 and GDPR, the HM Treasury and the financial services industry (all the major banks) led an initiative in the UK under the title of Open Banking Working Group (OBWG), which set out a vision for open banking in the UK. The Competition and Markets Authority, in parallel, conducted a review of the PCA and SME banking market and has released a set of 'remedies' to address the market shortcomings. As part of these remedies, the CMA is requiring these banks to implement the open banking initiative. We see four overarching objectives of this regulatory agenda that have significant implications for the payments market:

1. Increasing competition – creating a level playing field, based on common, open standards with no geographical discrimination.
2. Stimulating innovation – supporting entry of more efficient players by enforcing transparent and fair pricing practices, and allowing winners to reap rewards in a larger integrated market.
3. Creating more choice and transparency for consumers – ensuring that customers have a choice of payment options, with visible cost implications for their payment decisions.
4. Improving payment security and customer trust – guarding safety of payments at PoS, by support development of more secure and safer remote payment technologies.

In the following subchapters, we provide an overview of key pieces of regulation and the implications for the industry and competitive dynamics.

MIF

EU regulation on Multilateral Interchange Fees (MIF) came into force in March 2015, and introduced caps on interchange rates across debit transactions (at 20 bps) and credit transactions (at 30 bps) on 4-party schemes, with extension to 3-party schemes expected by 2018.

OVERVIEW OF KEY EU REGULATION AFFECTING PAYMENTS

	1 MIF (INTERCHANGE REGULATION)	2 PAYMENT SERVICES DIRECTIVE 2 (PSD2)	3 GENERAL DATA PROTECTION REGULATION (GDPR)
Context	Address anti-competitive effects interchange and selected other practices	Update of the current payments directive to cover new innovative payment services	Address implementation issues with 1995 data protection directive
Key provisions	• Caps on interchange: 0.2% on debit and 0.3% on credit (excludes commercial cards and 3-party schemes) • Separation of scheme and processing • Ban on geographical discrimination in issuing/acquiring within EU • HCAR can apply only to cards in scope of interchange regulation	• New rules on access to customer payment accounts by 3rd party payment initiators • Clear liability allocation rules for transactions with multiple PSPs • Additional transparency requirements • Stiffer customer authentication rules	• Update to data regulation including – Ease of data access – Right to data portability – Data protection by design and default • Covers all entities which process EU citizens' data • Single supervisory authority • Harmonisation of requirements enabling cost savings and business movement • Fines up to 4% of global turnover for on-compliant companies
Timelines	• Passed by European Parliament in March 2015 • Caps applicable from 6 months after legislation comes into force	• Passed by European Parliament in Oct 2015 • Probable implementation ~2017	• Passed by EP European Parliament in Apr 2016 • Full implementation by May 2018

SINGLE EUROPEAN PAYMENTS AREA (SEPA)

- EU initiative to integrate the European retail payments market focused on electronic payments
  - Largely complete for direct debits and credit transfers (legislative deadline passed in 2014)
  - SEPA for cards – "any card at any terminal" still requires considerable efforts (no set deadline)

OPEN DATA

- EU update to data regulation
- New regulation to be implemented by May 2018

The rationale for imposing interchange caps is to maximise customer utility. Regulators expect this fee reduction to be passed on to merchants through reductions in MSCs. This would also serve to intensify competition among acquirers. This reduction in payment costs is in turn intended to be passed on to the end consumer.

MIF regulation also included business rules designed to tackle the dominance of two international card schemes (Visa Europe and MasterCard) and promote competition.

These rules include:

- **Separation of cards schemes and processing entities:** requiring the separation of scheme management and governance from processing activities.
- **Abolition of "Honour all products/cards":** providing merchants the freedom to accept only those card schemes and/or brands best suited to their needs.
- **Right to co-brand:** giving account providers the right to choose and issue multiple schemes/brands on a single card, mobile or online wallet; and giving consumers a choice of brand at PoS.
- **Ban on geographical discrimination:** extending validity of licences for card issuing and merchant acquiring across the EU.

Once fully implemented, we expect MIF regulation to have widespread implications for the payments industry, to exert additional pressure on issuer economics, and to increase competition between international and national card schemes.

The first impact we expect to see is an introduction of annual fees, particularly for credit cards and nonfranchise customers, as issuers look to substitute lost revenues. Customers are likely to react by consolidating to front-of-wallet cards, cancelling redundant or dormant cards, thereby resulting in an overall reduction in card penetration levels.

We expect the combination of the lower interchange cap set for debit and abolition of "honour all cards" to accelerate a shift in payment volumes from credit to debit cards, due to lower acceptance rates at PoS. This trend will further reduce interchange revenues for credit card issuers and place additional pressure on credit card economics.

The impact of this lost revenue will be felt most acutely on the economics of premium credit cards. Rewards programmes, previously subsidised by interchange income, are likely to be reined in. In the longer term, premium brands may have to consider restructuring their propositions away from the traditional transaction-driven, issuer-sponsored, rewards-for-spend model. Such models are likely be replaced by merchant-sponsored rewards programmes and more customer-centric propositions designed to strengthen the relationship.

The separation of cards schemes and processing entities will have two effects on the market. Firstly, it will result in increased competition in processing, which in turn is expected to drive down costs. However, we expect this development to have a minimal impact on the economics of the overall system, as processor margins are already low. Instead, we expect it to increase consolidation in the processing layer as players look to realise the cost benefits of scale.

Secondly, it will lead to greater price transparency, putting schemes under increasing pressure to justify their fees. We anticipate that schemes will respond by introducing new value-add services in order to justify their margins. Moreover, international and national card schemes will now compete to become the unique brand accepted at PoS.

The MIF regulation may also have some unintended consequences. The reduction in interchange (passed on via MSC) will make card payments systems more cost competitive than was the case in the past. This will reduce the incentive for merchants to switch to alternative payment systems (such as A2A-based schemes) and may have an adverse effect on the adoption rates of these new technologies. It may also lead to a modest reduction in card-related infrastructure investment. If this reduction materialises, it will be felt most acutely in less mature European cards markets.

PSD2

The EU has introduced PSD2 to modernise the current payments directive (PSD1) in the face of new technologies, new types of payments services, and new players with innovative business models.

PSD2 has the following objectives:

- Drive further unification of national regulations in order to create a more integrated market.
- Level the playing field for service providers, taking into account new players.
- Make payments safer and more secure for customers, and introduce greater levels of protection for customers.
- Encourage lower pricing for payments.
- Facilitate the emergence of common technical standards and interoperability.

In "Key provisions within PSD2s", we provide an overview of the key provisions within PSD2.

We expect PSD2 to have radical implications for the payments industry.

New rules designed to provide access to payment information for third-party providers form a major component of the PSD2 regulation. PSD2 introduces a new type of regulated entity – a Third Party Payment Service Provider (TPP).

KEY PROVISIONS WITHIN PSD2

KEY PSD2 DIRECTIVES

A PROVIDING ACCESS TO CUSTOMER ACCOUNTS

- A payment service user has the right to make use of services enabling access to payment account information
- There should be a non-discriminatory treatment of TPPs by the PSPs and no restrictions on gaining information access to user accounts
- Payer has the right to make use of a payment initiation service provider (PISP)
- PSPs should not apply additional charges to payments originating from PISPs or treating them as lower priority payments

B INCREASING TRANSPARENCY OF CHARGES & PAYMENTS

- It is essential for payment service users to know the real costs and charges of payment services in order to make their choice
- PSPs shall provide payment service users with all charges payable by them and, where applicable, the breakdown of the amounts of any charges
- Information should be provided to the payer and the payee both before and after the execution of the payments

C ENHANCING AUTHENTICATION MEASURES

- PSPs should apply strong customer authentication when the payer
  - accesses his payment account on-line
  - initiates an electronic remote payment transaction
  - carries out any action, through a remote channel
- "Strong customer authentication" means an authentication based on the prompt use of two or more elements categorised as knowledge, possession and inherence that are independent (2 factor authentication)

D PROVIDING ACCESS TO CUSTOMER ACCOUNTS

- Liability to be broadly shared between the payer's and payee's PSP, with each of them responsible for their part of the transaction
- The user should be liable only for a very limited amount, unless the payment service user has acted "fraudulently" or with "gross negligence"
- There is a small liability for the payer resulting from the use of a lost or stolen payment instrument or, if the payer has failed to keep the personalized security credentials safe, from the misappropriation of a payment instrument

TPPs come in two forms:

Exhibit 29: Types of TPPs

TPP	DESCRIPTION
Account Information Service Providers (AISPs)	• Online aggregators or other third-party service providers that access payments information across one or more payments accounts and present it back to the customer (e.g., Yodlee and Mint) • Potential providers also include: online price comparison websites (e.g., MoneySupermarket.com)
Payment Initiation Service Providers (PISPs)	• Third-party that provides a "digital portal" or "software bridge" between payer and the payment services provider (PSP) or account servicing provider (ASPSP) of the payer • Permitted to initiate payments on behalf of, and at the request of, the payer by issuing an order to the payers' PSP/ASPSP

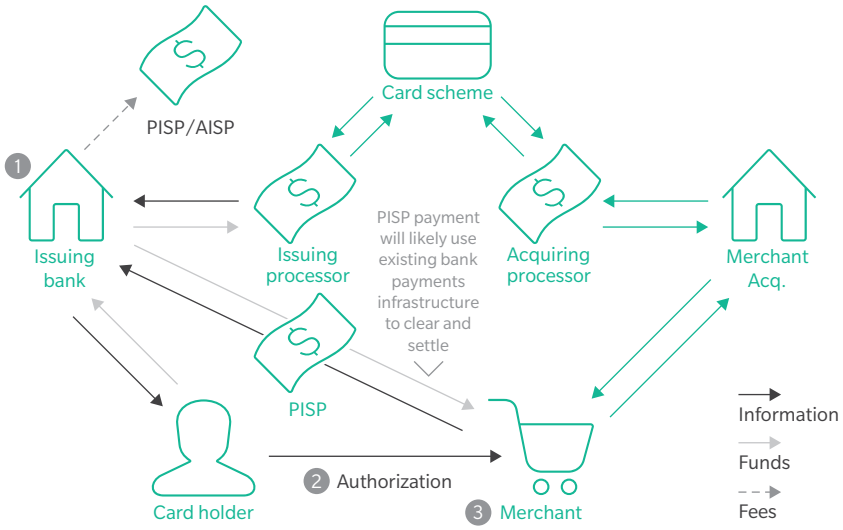
After PSD2, banks will be obliged to give third-party service providers access to their customers' account information (providing the customer has given their explicit consent). In addition, PISPs will be able to issue payment orders that must be executed by the account service provider without discrimination, and with no additional charge.

PSD2 also provides for greater transparency in relation to the costs and charges associated with different payment means. This information will be provided to the customer before a transaction is initiated, so that customers can make an informed decision about which payment means to use, fully aware of the associated costs.

We think PISP propositions in particular are potentially highly disruptive and that their introduction will have profound implications for players across the payments industry.

- PISPs offer customers the attractive proposition of accessing all of their accounts and managing their transactional activity from a single portal. The PISP ecosystem could potentially extend beyond financial services accounts to encompass customer accounts of utilities (water, gas, electricity), local authorities (council tax), and large merchants.
- PISPs pose a significant threat to banks due to the risk that they intermediate the bank and their customer base. PISPs have the potential to become the customers' primary port of call for financial services, by wresting control of a significant portion of the customer relationship from banks and relegating their PCA/BCA business line to that of a service provider.
- Introduction of PISPs (or indeed AISPs) may also lead to competitive pressures in the credit market. PISPs will have access to a more comprehensive picture of the customers' expenditure and transactional activity. They will be in a position to provide this information to other lenders, upon instruction from the customer, to support credit decisions. This position will be reinforced by the right to portability provisions in GDPR (see "GDPR" below).
- PISP solutions could also support a number of different payments instruments that, combined with the PSD2 provisions relating to transparency of pricing and charges, would result in additional competitive pressure for the cards networks.

Exhibit 30: PISP circumventing cards payment rails



Key regulatory changes

1. Issuing banks will be required to allow access from authorized PISPs and AISPs
2. Strong authentication
3. Merchants can become PISPs and directly access consumers' current accounts

Furthermore, common technical standards for PISPs likely to open up competition to be **pan-European vs regionally based**

After PSD2 implementation, the traditional card payment rails could be circumvented if customers of the PISP entity choose to route payments through cheaper A2A networks, cutting out schemes and merchant acquirers. An illustration of this is provided in Exhibit 30.

This development could have an impact on the card volumes, as some card (mainly debit) transactions become A2A. The convenience offered by a comprehensive PISP solution is also likely to make A2A a more attractive online payment option, resulting in a reduction in e-commerce volumes for card schemes. The pricing of these transactions would be pivotal in leading to broad acceptance and, hence, increased take-up.

The greater choice between payment means and transparency for charges enabled by PISPs is also likely to put pressure on acquirer margins. We expect that this will lead to a modest reduction in MSCs for debit and credit cards. We expect acquirers to broaden their participation across different payment means in an attempt to protect MSCs, offering more payment options at physical point of sale to merchants (including A2A). This will drive a further reduction in the growth of card volumes.

In our view, banks are well placed strategically to perform the PISP role, providing that this is a part of a broader financial services platform, including customers' credit facilities, savings, and investment portfolios. This will, however, require a significant investment in technology and the user interface in order to deliver the desired customer experience. Potential PISP competitors include the m-wallet providers and technology giants (such as Apple and Samsung), fintechs, large merchants or merchant consortia, and the banks themselves.

We expect to see players launching PISP-like propositions in the medium term in an attempt to establish market position, pre-empting PSD2 implementation and launching additional functionality as its provisions are written into law and regulation.

GDPR

The EU agreed its new General Data Protection Regulation (GDPR) in December 2015. GDPR has the following objectives:

- Enable people to better control their data in the digital age.
- Harmonise data standards and management processes across the EU.
- Reinforce consumer trust by introducing data sharing assurances.

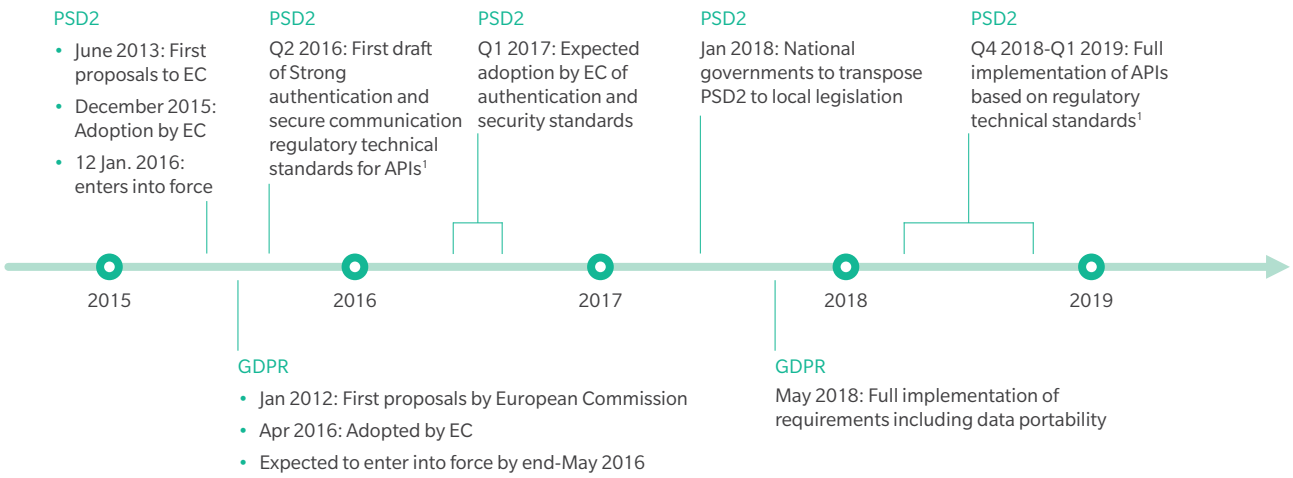
Taken together, GDPR and PSD2 create the framework to support an era of open banking, enabling a world that has higher data portability and interoperability between various market participants. Such a framework is scheduled to come into force by 2020. Exhibit 31 provides an overview of the implementation timelines and milestones.

A core tenet of GDPR is the right to data portability. This provision stipulates that an individual has right to move personal data across service providers, including startups and small players, promoting competition. Data will need to be provided in a structured and commonly used electronic format to support portability.

This provision reinforces the obligation imposed upon banks by PSD2 to share their customer account data with TPPs, and will support the development of PISP propositions by nonbanking players (such as m-wallet service providers), thus promoting more competition in this market.

Exhibit 31: Overview of "Open Banking" timelines driven by EU regulation

RELEVANT REGULATORY MILESTONES



1. The European Banking Authority is required to implement the regulatory technical standards for strong authentication and secure communications 12 months after PSD2 enters into force. They will come into force 18 months following adoption by the European Commission

Source: EBA

SUPPLY SIDE

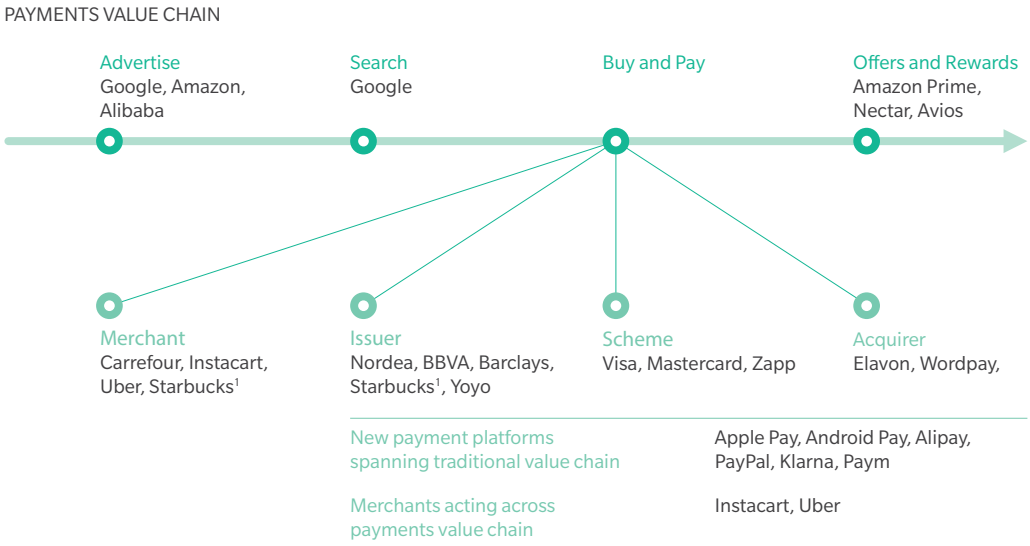
PSEUDO SCHEMES

The advancements in the payments infrastructure (increasing mobile acceptance, real-time settlement and clearing, increased digitisation of associated services such as invoicing), and a sense of fatigue with the existing market structures and the regulatory changes, have led to the rise of "pseudo schemes".

We define pseudo schemes as alternative schemes which can either run on existing infrastructure as another entity in the value chain, with associated charging structures (such as ApplePay), or as a new end-to-end scheme with a closed core participant group or segment (such as MCX in the US or Zapp in the UK, which was never launched but could be revitalised following the acquisition of VocaLink by MasterCard).

The reduction in interchange levels, high existing MSCs, and the ongoing development of real-time instant payments across Europe would allow the development of commercial models for these schemes, which benefit the merchants and consumers in terms of either cost benefits or experience.

Exhibit 32: Schematic of supply side dynamics



1. Closed loop payment system

Source: Oliver Wyman analysis

Europe has not seen any significant shifts in this part of the supply side just yet, and a successful model has still to emerge that is able to draw meaningful volumes from the system. But with the opening up of data and account information, along with the development of European real-time payments infrastructure and a push towards A2A payments, this could be a development to look out for.

CLOSED LOOP SYSTEMS

The term "closed loop" describes a payment solution offered by a merchant or third party that captures a customers' card details for payments to particular merchants. This may involve loading a balance on to the application, which is then topped up as required, or may involve a separate transaction drawn from the selected card for each transaction.

Closed loop systems offer incentives to customers, such as linkages to attractive merchant loyalty schemes. For merchants, the schemes provide competition to the likes of ApplePay, whose pseudo scheme model increases the fee paid by the merchant per transaction.

Starbucks has offered the most successful closed loop solution, attracting over 10 million active users with 9 million mobile payments per week, and has led other firms to approach Starbucks for a white-labelling proposition. As well as reducing payment costs, Starbucks has benefited from greater customer loyalty and higher brand awareness.

Other examples include YoYo wallet in the UK and WalmartPay in the US. Despite these successful examples, we don't expect closed loop solutions to have a significant impact on the overall dynamics of the payments landscape.

In addition to traditional card based solutions, Klarna offers an alternative where the end customers can choose between two distinct ways of paying (account/installment loan or invoice), while the merchant is paid in full with one single payment. This solution doesn't require any of the cards' infrastructure and could be considered closed loop. Klarna also offers a checkout solution, acting as a gateway/PSP, enabling retail payments through debit/credit card.

COMMERCIAL MODELS AND M&A

A shift in ownership and commercial models is beginning to occur. It is transforming the payments infrastructure from a mutually owned not-for-profit utility, to a privately owned infrastructure looking to achieve commercial returns.

Historically, the retail payments infrastructure was either owned and operated by the banks themselves or by not-for-profit entities acting on behalf of a consortium of local players.

However, in-house payments operations have come under growing scrutiny by banks, which are looking to sharpen their business models and reduce their fixed-cost base. An increase in sales, acquisitions, and disposals is leading to a transition in ownership of this infrastructure toward private investors who are seeking commercial returns.

An example of this activity is the RBS carve-out and floatation of their merchant acquiring business as WorldPay. Similarly, private equity groups have taken stakes in payments providers such as the Nordic payments processor and acquirer Nets, and Italian payments provider ICBPI (which acquired Setefi and ISP Card from Intesa Sanpaolo to set up ISP Processing).

Other major examples of this consolidation trend include the merger of Worldline and Equens, and the buyout of Vocalink by MasterCard (pending approval from the authorities). The latter deal is not only interesting from a consolidation perspective, but also allows MasterCard to make a significant step away from plastic into the digital world. It has now become the infrastructure provider of Faster Payments, which it could leverage for their development of A2A payments in Europe. With this move, MasterCard has also positioned itself well in the UK market, traditionally dominated by Visa. Overall, it appears that this buyout strengthens the duopoly of Visa and MasterCard in Europe, a situation that appears in conflict with the European regulators' ambition to increase competition among payment players in Europe.

We expect this trend to continue, resulting in greater consolidation of the ecosystem in the medium term. The emergence of payments giants in Europe will be followed by a spate of M&A activity as these new players look to consolidate their market position and realise the cost benefits of scale. As a consequence, banks will have to rethink their own relationship with these players, some of which are moving from being partners to competitors, and will have to assess how to cope with this even stronger competition.

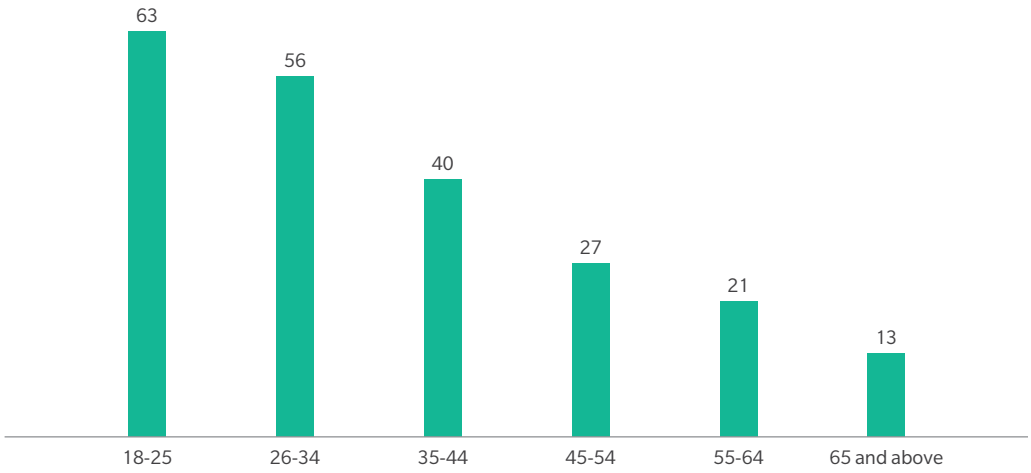
DEMAND SIDE

Consumers' willingness to adopt new and innovative payment technologies is growing over time. One of the key factors driving customer adoption is age. While younger generations, especially the millennials, tend to be more willing to experiment with new technologies, the older generations appear more cautious.

Exhibit 33 below shows the percentage of survey respondents who have made at least one mobile payment transaction in the past month, and shows a clear trend towards higher adoption of mobile payments among younger generations.

Exhibit 33: Mobile payments uptake by age group

% OF RESPONDENTS WHO HAVE MADE AT LEAST ONE MOBILE MONEY TRANSACTION IN THE PAST MONTH[1]
Q2 2014



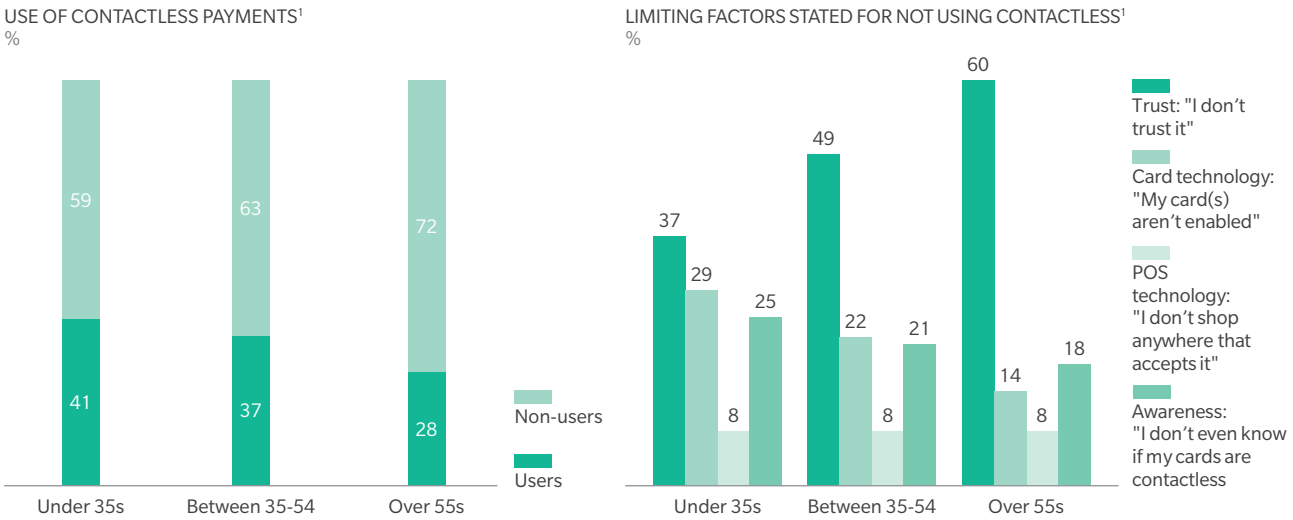
1. All respondents were banked smartphone users

Source: Goldman Sachs Worldpay report November 2015, Oliver Wyman analysis

The main reasons for not using new payment methods include trust, concerns over security, lack of awareness of the technology or how it works, and lack of the necessary technology, either on the part of the consumer or the merchant. However, we believe that consumers will become more open to trying newer technology and payment methods if the experience is smooth and simple, including easy authentication. PSD2 could enable a standardised set of authentication and security measures embedded in the consumer journey, which could in turn have an impact on the take-up of enhanced mobile payments propositions.

Exhibit 34 below shows the results of an online poll of UK residents in which the use of contactless card payments decreases among older generations. The most common reason for not using contactless payments was a lack of trust.[9] This answer was much more frequent among older survey respondents.

Exhibit 34: Factors influencing use of contactless payments



1. Online poll responses from over 2,300 UK respondents; 'Users' include those who would prefer a higher transaction limit and those who are happy with the £30 limit

Source: FutureThinking and Toluna contactless poll Apr 2016, Oliver Wyman analysis

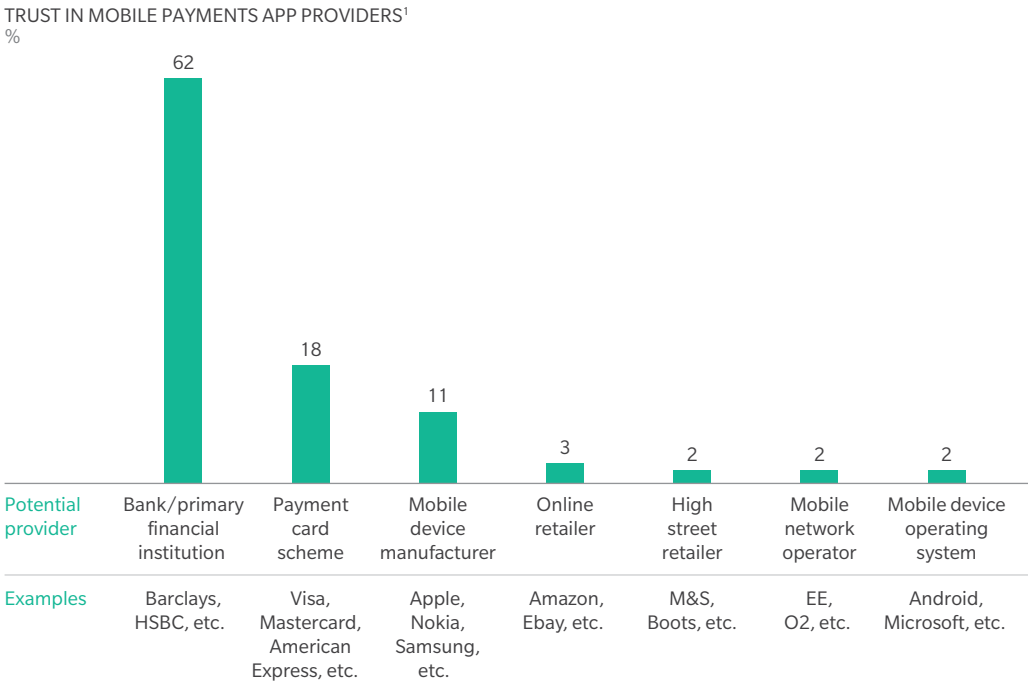
9 2,315 survey respondents; six responses possible: "I pay using Contactless and hope the limit keeps going up", "I pay by Contactless but think £30 is the maximum it should be", "I never pay by Contactless as I don't trust it", "I don't pay by Contactless as my card(s) aren't enabled", "I don't pay by Contactless as I don't shop anywhere that accepts it", "I don't even know if my card(s) are contactless"

Banks and other established financial services firms appear to be best positioned to alleviate these concerns among consumers. According to a UK survey, consumers are most likely to place their trust in traditional financial services firms in providing a mobile payments app (see Exhibit 35). These comparatively high levels of consumer trust place banks in a good position to capitalise on the provisions of PSD2 and attract consumers with PISP propositions.

However, technology giants, such as Apple, Google, Samsung, AliPay, and PayPal, pose a credible threat. These firms have an established track record of bringing compelling consumer propositions to market, and frequently receive higher customer-satisfaction rates. Furthermore, they tend to be more agile in product development and are likely to have more appetite to be the first to introduce more innovative propositions, and so build market position early on.

We expect customer adoption rates for new payments technologies to grow steadily over time. The factors limiting adoption are also likely to decrease, as consumers become more familiar with the new technologies and as the industry invests in security and authentication to address trust concerns. While banks seem well-positioned to become the go-to providers in this space, they will probably have to act quickly to see off a threat from other non-financial services providers.

Exhibit 35: Trust in mobile payment app providers



1. Survey responses from 525 UK residents, all respondents owned a smartphone, "Whose mobile payment app would you trust the most to safeguard your personal and financial information?"

Source: TSYS 2015 UK Consumer Mobile Payment Study, Oliver Wyman analysis

MARKET SIZE AND REVENUE POOL FORECASTS

We have reviewed the impact of the disruptive trends identified in "Disruptive trends" and produced top-down forecasts of payment volumes and revenue pools up to 2020.

Two scenarios have been considered:

1. Low disruption: a scenario where the trends described have a lead time before mass adoption (for example, with higher adoption being reached beyond 2020).
2. High disruption: significant investment from the participants in the value chain to drive alternative payments such as A2A, as well as a rapid upgrade of tech and wider payments infrastructure to support regulatory objectives and enhance the uptake of electronic payments as a whole.

Exhibit 36 provides an overview of the hypothetical narrative accompanying either potential scenario. We expect the greatest impact of the disruptive trends identified in "Disruptive trends" to be felt in respect of the mix of payments volumes in each market.

In both scenarios, and across all markets, we expect to see growth in electronic payment means and a relative decline in the use of cash and cheques. Over time, we expect debit cards and A2A to substitute cash spend at PoS, and to drive a terminal decline in cheques.

Exhibit 36: Scenario narratives

1. LOW DISRUPTION	2. HIGH DISRUPTION
• Increase in adoption of m-wallets and other A2A enabled PSPs (e.g., SWISH) • **Strong growth A2A**, particularly in more mature cards markets – Driven by single payments initiated from A2A PSPs – Growth in P2B volumes at PoS – Standing orders and other forward-dated mechanisms broadly stable • **Growth in cards**, but at different rates across Europe – In mature markets due to: – Modest growth in penetration rates – Medium/strong growth in debit (particularly spend at physical PoS) – Investment in PoS tech and security to protect volumes – Investment in less mature markets by international cards schemes to grow card penetration rates and spend (particularly debit) • **Cash volumes growing**, but share relative to other payment mechanisms declining • **Decline in cheque volumes** (replaced by A2A)	• Front-running of A2A immediate payment enabled "PISP" propositions attracting high adoption rates • Increasing competition from A2A PSPs on two fronts: – Launch of A2A pseudo scheme driving P2B volumes and cannibalising cards volume growth at physical PoS (particularly Debit) – Higher value P2P payments (replacing cheques) • Proliferation of closed loop networks amongst large merchants reducing PoS volumes

Credit and debit card volumes will continue to grow overall. However, the rate of growth is likely to decline in more developed markets, as contactless networks approach saturation and card penetration rates plateau. We expect participants to invest increasingly in less mature markets to establish market position and release latent capacity. Debit volumes in particular are expected to grow in these markets.

A2A-based solutions are expected to become a larger feature of the retail payments landscape, with growth initially driven by P2P payment volumes, but with the technologies and pseudo schemes emerging to support P2B payments. This development will also depend on the level of readiness of the acceptance infrastructure. The competitive pressure is expected to be particularly acute in the more mature card markets where market participants, such as the payments network providers, have recently invested in the real-time payments platforms (such as in the Nordics and the UK and Ireland).

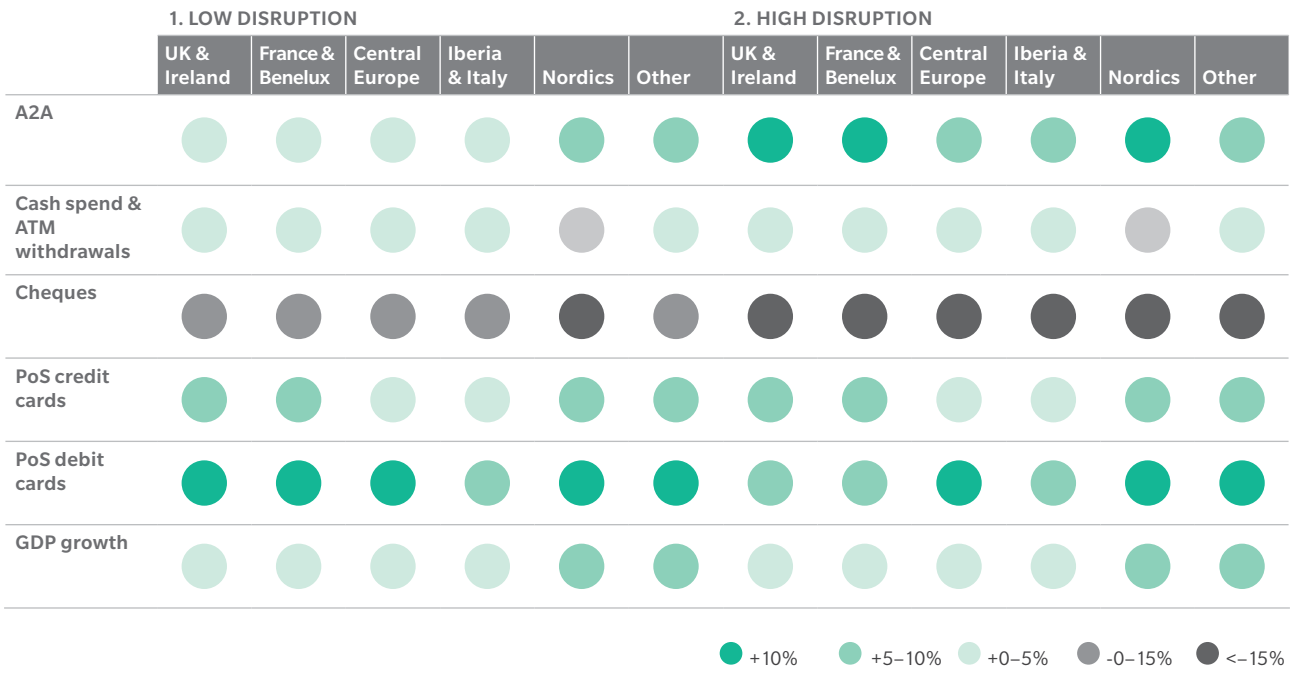
In the high disruption scenario, we expect to see greater substitution of debit card spend by A2A. In this scenario, we also assume that cheques would become entirely obsolete in more mature markets, again being replaced by A2A and debit.

Exhibit 37 provides a summary of these volume changes in each market across both the low and high disruption scenarios.

Margins are not expected to evolve as dramatically over the 2014-2020 period.

Exhibit 37: Impact assessment on payment volumes

VOLUME TRENDS (# TRANSACTIONS), 2015-20 CAGR%



Source: Oliver Wyman analysis

A very modest reduction in MSC is expected in the more mature cards markets, driven by competitive pressure from A2A-based payment solutions in the SME sector. We would expect acquirers to respond to this threat by broadening their participation to incorporate A2A and protect MSCs, and thereby remain largely relevant. Processing fees are also expected to decrease modestly as the sector consolidates and players realise cost benefits of scale. However, these savings may be retained by the processors if private capital continues to flow into this sector, seeking a commercial return.

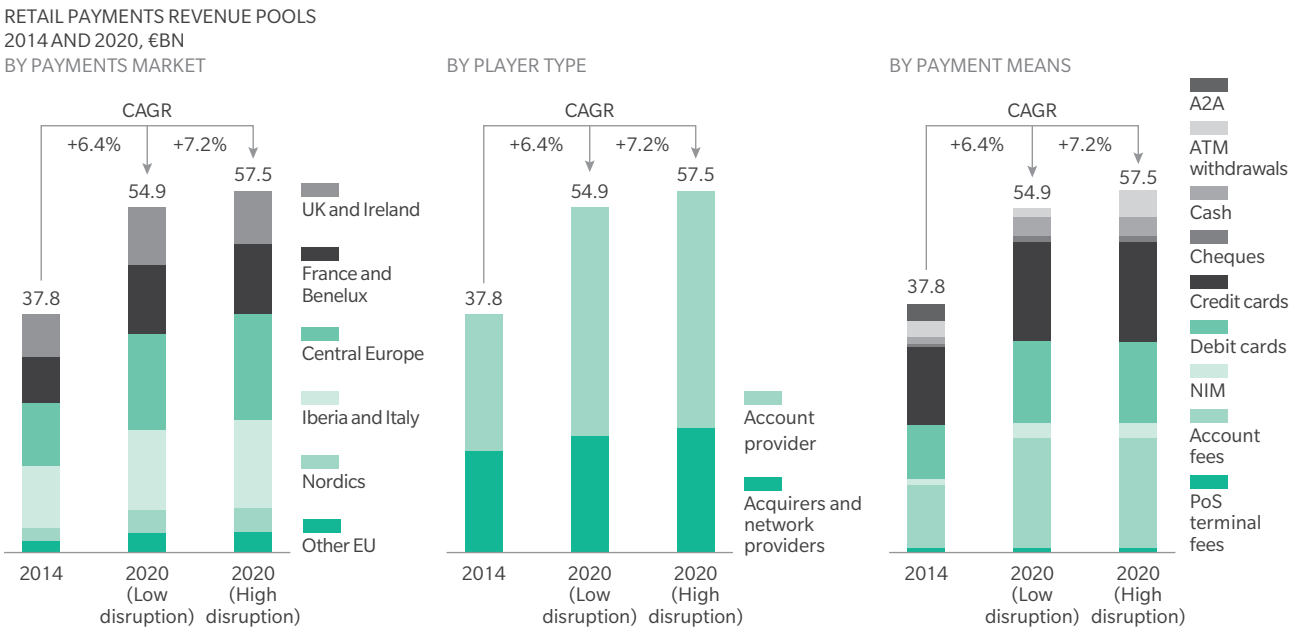
We expect to see an increase in account fees as banks look to improve the economics of current accounts by substituting lost interest income on deposit balances and recover costs relating to transaction activity. Cardholder fees are also expected to increase as a consequence of MIF, as described in "MIF".

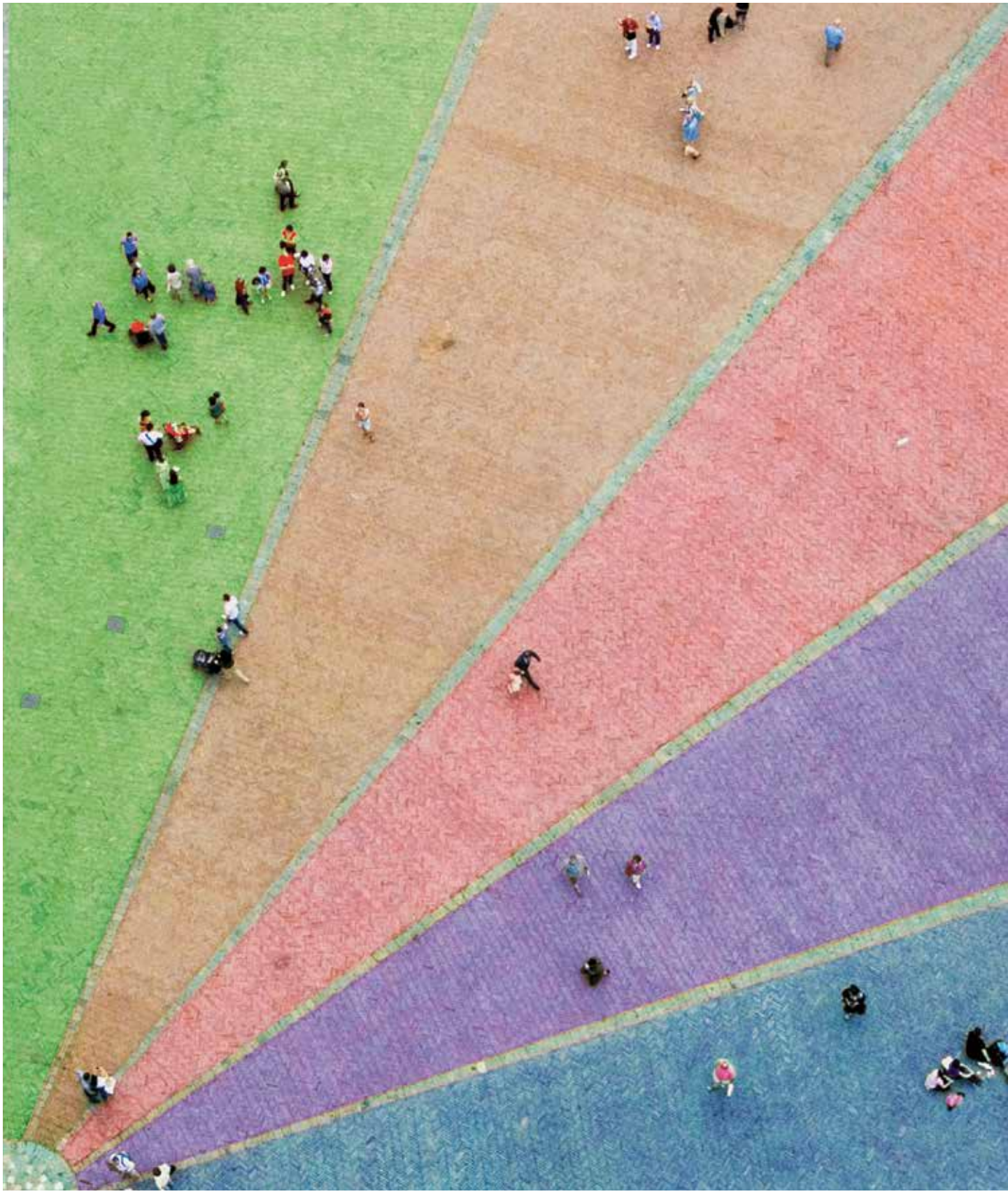
Overall we forecast our revenue pools to grow at a rate of around 6-7 percent CAGR from approximately €38 billion in 2014 to €55 billion by 2020, given the low disruption scenario. Growth will be driven by:

- **Increase in account fees**, which is captured exclusively by the account providers.
- **Growth in debit and credit card spend**, which results in higher MSC revenues for the acquirers and network providers, and interchange revenues for the account providers.

In the high disruption scenario, we expect the overall revenue pools to reach approximately €58 billion by 2020. However, we expect the greater share of this to be retained by the account providers. This is due to today's cheque volumes and high processing costs (€0.70 to €1.30 per transaction) being increasingly substituted by A2A and its comparably low cost.

Exhibit 38: Revenue pool forecasts





CONCLUSION

SETTING THE SCENE

The new paradigm promises to bring about a number of challenges and opportunities for every participant in the payments market. The future European payments market might look very different to what it is today. For example, it could be characterised by:

- New and non-traditional players (such as TPPs, big retailers, technology giants).
- Highly proliferated payments instruments, including a number of variations of mobile-led payments (such as virtualised cards, provider app-based transactions) and universal payments acceptance terminals.
- Smart routeing of transactions between traditional cards and A2A rails.
- Payments increasingly supporting the broader strategic initiatives of market players (retailers, app developers), such as through the enhancement of customer experience (for example, on-the-go checkout at physical stores).
- New definitions of customer ownership and relationships, as the roles of various participants become increasingly unclear. This could be a major challenge.

The established players (banks, payments companies, infrastructure providers and tech giants) have a sound platform on which to build, but they also face great threats of disintermediation, loss of revenues and weakening customer relationships. The nimble tech companies have already proven their strength in providing customers with innovative solutions which supplement existing payments infrastructure and processes.

Nonetheless, we believe that there are substantial openings in the various markets, and that opportunities exist for all players, both new and existing. As you begin to define a strategy for your organisation, there are some key strategic responses that you must prepare in order to fend off any threats and pursue opportunities.

STRATEGIC RESPONSES

The vision and capability of your organisation will be tested as the payments markets evolve. Irrespective of what type of player you are, there are a number of imperatives and avenues to be explored for your business:

- Protect, grow, and maximise revenues.
- Offer solutions that fulfil the demand side.
- Innovate and disrupt to change the supply side.
- Enhance customer relationships (where customers are not just end users but also include others, such as corporates, merchants, PSPs, and TPPs).

We believe that there are some crucial choices to be made for each category of market participant, with some common threads for each.

Exhibit 39: Checklist of strategic responses

PLAYER TYPE	COMMON AREAS OF RESPONSE DEVELOPMENT	SPECIFIC ADDRESSABLE AREAS (NOT EXHAUSTIVE)
Issuer/PSP	• Levels of awareness of implementing threats and opportunities • Shape of the future market (scenarios which may develop) • Business units best placed to target opportunities • Scale and nature of your at-risk revenues • Organic/Inorganic strategy to protect and enhance your market position • Cannibalisation vs. alternative business model decelopments	• Level of participation in the development of the market (A2A infrastructure/partnerships/security and authentication/contactless) • Tech and balance sheet provider for TPPs vs. core player
Acquirer		• Remaining relevant at POS (Physical/ virtual – acceptance solutions/VAS/partnerships and collaborations) • Pricing, investment in infrastructure, enablement of new payment types
TPPs (AISP/PISP)		• Available revenue models and future value chain participation • Ease of integration into external party systems – customer journey enhancements
Payment companies and infrastructure providers		• Value at risk analyses and extension of products and solutions • Cannibalisation of existing revenue streams with new payment methods
Scheme owners		• Identification of core customer groups and associated strategy • Cards vs. A2A play; market incentivisation models • End user relevance (experience/ease of use/ adoption)
Tech giants		• Market and segment choices • "Superceding" the available market choices (PSPs/TTPs/payments methods)
New tech players		• Careful partner selsction and balance between owning and servicing customers • Migration to end user brand vs. intemediated approach

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation.

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