

FINANCIAL CONDUCT AUTHORITY
PAYMENT SYSTEMS
REGULATOR



Innovation in UK consumer electronic payments

A collaborative study by Ofcom and the Payment
Systems Regulator

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About this document

This document has been produced jointly by Ofcom and the Payment Systems Regulator (PSR) to provide an overview of non-bank and collaborative financial sector-led innovations in UK payments and the communications technologies that enable them. Take-up of new communications technologies can help to enable innovation in the UK payments sector; for example, take-up of smartphones can enable financial services firms to launch new payments innovations. As such, the payments industry is a mutual topic of interest for both Ofcom and the PSR, and this study is an example of regulators working closely together on an area of shared focus.

Over the course of a two-month period between April and June 2014, we held discussions with communications firms, prominent non-bank financial services firms, and the developers of recent collaborative innovations. This provided information on the incentives and challenges facing innovators and the benefits that innovations can bring to consumers and merchants. The research in this document is based primarily on these meetings.

This document will be used by Ofcom and the PSR to inform their future work programmes. It does not contain any policy recommendations. We hope that it will be useful to stakeholders in the communications and financial services sector and policy makers, helping them understand this complex and dynamic sector.

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Section 1

Executive summary

Communications technologies are facilitating the development of many payments innovations

- 1.1 Considerable innovation in payments is taking place in the UK. Financial and communications firms are developing new consumer and merchant-facing payments propositions. Technology is supporting these developments; for example, high levels of smartphone take-up and the growth of contactless cards and point-of-sale (POS) readers are encouraging payments innovation. In our discussions with stakeholders, we found a general acceptance that, in time, a significant proportion of consumer electronic payments are likely to be made using a mobile phone.
- 1.2 Across consumers, merchants, and innovators (i.e. providers of innovative payment services), a variety of benefits and incentives are driving innovation development and adoption of new approaches.
 - Payments innovations may offer consumers improved convenience through a more frictionless payment experience, greater value through deals and loyalty offers, and potentially enhanced security through utilising smartphone-enabled technologies.
 - Merchants, meanwhile, could also leverage new innovations to reduce costs, increase sales and deepen customer relationships by offering a more frictionless, value-additive payment experience.
 - As providers of innovative payment services, financial and communications firms are seeking to increase or gain a share of existing revenue streams (often through transaction fees), generate new revenue streams from transaction fees or value-added services, and/or drive revenues through improved customer acquisition and retention.

Many types of firms are innovating

- 1.3 New and established players are developing innovative consumer payments services.
 - Banks have collaborated to launch the mobile payments service Paym, and several are lead partners in Zapp, a person-to-business (P2B) offering which is expected to launch in 2015. Both of these innovations use Faster Payments (FPS), rather than a card network, to make payments from customers' bank accounts via a mobile banking application.
 - Card networks, such as MasterCard and Visa are entering into commercial agreements with mobile operators, handset manufacturers, online platform providers and banks to deliver payment innovations. They are also developing their own digital wallets. In this way, they are contributing to innovation in the industry, while trying to ensure that their networks remain a core component of the payments value chain.

- Mobile players (both operators and handset manufacturers) are seeking to enable payments services by creating ways to store financial details securely and to communicate with Near Field Communication (NFC) enabled point of sale devices. There are a number of alternative ways to do this, including use of the mobile SIM card, a secure chipset built into the hardware of the phone, or via 'host card emulation' using the Cloud.

These innovations are mainly at the consumer-facing end of the value chain, utilising the existing payments infrastructure

- 1.4 Communications players must work with financial services firms in order to access card and interbank payment systems. Also, communications firms are typically unwilling or unable to take on the obligations associated with becoming FCA-regulated payment service providers. New entrants offering mobile payments acceptance typically contract with merchant acquirers to reach a merchant base and the card networks to clear and process transactions.
- 1.5 Firms from the financial sector sometimes see benefits in close collaboration with firms from the communications sector, for example in order to benefit from opportunities associated with mobile payments. Apple Pay launched in October 2014 with agreements from the card networks and the largest US retail banks. Apple is reported to have negotiated a share of the interchange fees from card transactions with these financial institutions. Launch in the UK may follow in 2015.
- 1.6 Internet-connected consumers and new technology are encouraging some alternatives to the card networks such as PayPal. There may be potential for separate systems for the transfer of value, such as Bitcoin or payment systems based on social media networks, to grow further.
- 1.7 Communications providers may be able to extract a share of transaction revenues from financial institutions. However, the scope of current innovations suggests that there is little prospect in the medium term for new technologies or players to disrupt the primary payment systems.

Barriers to innovation

- 1.8 Although we found high levels of innovation in consumer and merchant payments, the payments industry displays characteristics which may constrain innovation.
- 1.9 **There are very high security and resilience requirements associated with providing payments services.** The payments sector is unlikely to support the same levels of innovation and creative destruction as in many ICT industries because (for sound reasons) there is very low tolerance among consumers, regulatory authorities or financial institutions for any risk of systemic failure.
- 1.10 **Network effects and economies of scale make entry difficult.** Some new payments services require the building of a virtuous circle of consumer demand and merchant engagement. This requirement could provide incumbent players with advantages and makes it difficult for new entrants to 'go it alone'.
- 1.11 **There are high levels of uncertainty about future industry and regulatory developments.** Stakeholders from the financial, communications and retail sectors reported that, to some extent, uncertainty about how the industry will develop is

constraining investment decisions. This uncertainty was both around regulation and around which technical standards would triumph.

- 1.12 **The incentives driving take-up and development of payment innovations do not always align across consumers, merchants, communications firms and financial institutions.** Our discussions with stakeholders suggested that this may stem in part from limited dialogue between providers and merchants in the design of innovative services.

What more could be done to promote innovation?

- 1.13 Innovation is primarily being driven at the consumer-facing end of the value chain and makes use of existing payment systems and infrastructure. As such, many of these innovations present limited scope for disruption of established payments systems today.
- 1.14 This model of downstream innovation at the consumer end means that good outcomes for consumers continue to depend on well-functioning upstream payments systems. In this context, there are a number of areas that warrant consideration in support of good consumer outcomes and to help stimulate potential innovation and competition where appropriate.
- 1.15 **Access to payment systems.** The facilitation of direct and indirect access to payments systems is key to encouraging innovation and good end user outcomes. The PSR is consulting on proposals to improve direct and indirect access to payment systems. This may facilitate further payments innovations by both bank and non-bank players. As part of this, the PSR will expect payment system operators to continue to engage with the PSR and the Bank of England in order to consider ways in which to broaden access.
- 1.16 **The effect of vertical integration between retail banks, payments systems and the underlying payments infrastructure.** The presence of vertical integration between retail banking and payments systems may result in concerns around aligned incentives and the ability of third parties to enter or innovate in payments systems or services. The PSR has considered issues of ownership and governance within its consultation paper, making a number of related proposals.
- 1.17 **The effects of financial regulation on innovators in payments services and systems.** Our stakeholder discussions identified some apprehension among potential non-financial services innovators about becoming regulated as financial institutions, including as a result of any future changes to the EU Payment Services Directive. Given the pace and scope of technological change, policymakers may wish to take a holistic view of what the current appropriate level of financial regulation for new entrants and innovators could be. Any such consideration would need to balance potential benefits from changes to financial regulation with the need to limit potential risks. One example of this is the FCA's 'Project Innovate', which includes an assessment of whether there are aspects of the regulatory system that pose particular difficulties for innovating businesses.
- 1.18 **Price controls on interchange rates.** The current European debate and activity on interchange fees may result in new business models in payments systems and services, and new or different relationships with innovators including communications providers. The PSR is expected to be the competent authority on UK interchange fees. This issue is covered within the PSR's consultation paper.

Section 2

Introduction

- 2.1 This document has been produced jointly by Ofcom and the Payment Systems Regulator (PSR) to provide an overview of non-bank and collaborative financial sector-led innovations in UK payments and the communications technologies that facilitate them. This document will be used by Ofcom and the PSR to inform their future work programmes, but does not contain policy recommendations. We hope that it will be useful to stakeholders in the communications and financial services sector and policy makers, helping them understand a complex and dynamic sector.
- 2.2 The remainder of this document is set out as follows:
- Section 3 provides the rationale for the study and describes the methodology adopted.
 - Section 4 provides the industry context, describing trends, the range of players involved and the regulatory landscape.
 - Section 5 describes the types of payments innovations appearing in the UK.
 - Section 6 describes the incentives for and barriers to payments innovation.
 - Section 7 considers the implications of these innovations for consumers and merchants.
 - Section 8 contains our conclusions and next steps.

Section 3

Rationale and methodology

3.1 In this section we describe the rationale for the study, including its scope and its relevance to Ofcom and the PSR. We also describe the methodology adopted.

Rationale for the joint study

3.2 The UK payments landscape is currently in a period of considerable change, driven by the opportunities created by new technologies. For instance, the total value of transactions made using contactless cards in the UK in May 2014 was £126.7 million – a 189% increase since May 2013¹.

3.3 Consumers, meanwhile, are increasingly “connected”, and the mobile phone appears set to become an important component of the payments ecosystem – over 60% of UK adults now own a smartphone². Consumer banking behaviours also reflect these developments, with 55% of consumers using online banking and 20% using mobile banking apps³.

3.4 In this context, the communications sector is playing an increasing role in the delivery of payments services; communications firms are developing their own payments propositions and communications technology is enabling financial firms to launch new payment services. These payment and communications technologies touch the regulated spheres of both Ofcom and the PSR.

3.5 We produced this joint report to understand these new developments and their implications for innovation. The report draws on the expertise of Ofcom and the PSR, and is an example of regulators working closely together where a shared focus area exists. The purpose of this document is to understand:

- the different propositions and players in payment innovation, with a particular interest in non-bank innovations and the payment systems that enable them;
- the incentives for and barriers to payments innovation, including the specific barriers faced by non-bank innovators; and
- the implications for consumers and merchants, in terms of both potential benefits and risks.

Scope

3.6 This study focusses primarily on non-bank payments innovations and on the communications technologies that enable them. The rationale for this scope is the particular interest that the Treasury, Ofcom and the PSR have in the enablers and constraints to non-bank payments innovation, especially given the recent developments in communications technology.

¹ http://www.visaeurope.com/en/newsroom/news/articles/2014/uk_contactless_payments_surge.aspx

² Ofcom consumer research in Q1 2014 found 61% of UK adults claimed to own a smartphone.

³ UK Card Association – March 2014: see - <http://www.bbc.co.uk/news/business-27202538>

- 3.7 Also within the scope of this study are collaborative financial sector-led innovations – where success depends on co-operation between multiple banks (e.g. Paym and Zapp). These provide helpful insights into the structure of the payments industry and the drivers and challenges faced by payments innovators generally. Payments innovations developed by individual banks are outside the scope of this study.

Relevance to Ofcom

- 3.8 The regulation of payment systems does not fall under the regulatory remit of Ofcom. However, the role played by communications firms in contributing to innovation in the sector, and by communications technologies in facilitating payments may have implications for aspects of communications regulation that fall under Ofcom’s duties. The integration of communications technologies and payments services could affect consumers of communications services in different ways.
- **Availability and resilience of networks:** the increasing reliance of payments services on communications networks is an important consideration for Ofcom’s work programmes on communications network availability, security and resilience. The widespread use of mobile networks for the transmission of financial data places new demands on networks which were not originally designed with this in mind.
 - **Consumer protection:** issues here include the potential increased likelihood of bill shock, the risk of fraud or scams, and the potential for consumers to be misled into making a purchase. There is also the potential for some groups of consumers to be excluded from specific payments services, for example, through lack of network access, device ownership, or skills in using communications services. There are also adjacent privacy risks in relation to sensitive consumer financial data.
 - **Switching:** payment services may potentially act in such a way as to raise barriers to switching, or to offer opportunities to retain customers using dynamic pricing or tailored value-add offers.
- 3.9 Premium rate services (PRS) are value-added goods and services that are charged to consumers’ phone bills or pre-paid phone accounts. They include premium rate calls and text messages, downloaded digital entertainment, app-based purchases and goods and services charged directly to phone bills (so-called operator billing⁴). PhonepayPlus is responsible for the day-to-day regulation of PRS through its Code of Practice. Ofcom approves that Code of Practice and, by regulation, requires service providers to abide by PhonepayPlus’ directions. As communications and payments technologies continue to integrate with each other, the underlying consumer issues associated with PRS – such as pricing and promotional transparency, consumer control over spending levels, informed consent to charging, and clear methods of exit from subscription – will also be increasingly relevant to other forms of digital content.
- 3.10 This study also supports Ofcom’s regulatory goal to research the communications markets constantly and to remain at the forefront of technological understanding.

⁴ Operator billing may also be referred to as carrier billing.

Relevance to the PSR

- 3.11 In March 2013, HM Treasury issued a consultation document “Opening up UK payments” on potential competition problems in payments systems. This consultation noted a perceived “slow pace of innovation in payment systems” and the fact that “a number of large banks dominate the industry at every level”⁵.
- 3.12 This consultation resulted in the creation of a new, economic regulator for payment systems, the Payment Systems Regulator, which was established in April 2014.
- 3.13 The PSR has three statutory objectives as set out in the Financial Services (Banking Reform) Act 2013:
- to promote **effective competition** in the interests of service users, in payment systems and the services they provide;
 - to promote development and **innovation** in the interests of service users in payment systems; and
 - to ensure payment systems are operated and developed in a way that takes account of and promotes the **interests of service users**.
- 3.14 Given the objectives above, this study will aid the PSR in fulfilling its innovation objective. The insights will inform future policy work for the PSR, but the study does not offer any policy recommendations.

Methodology

- 3.15 Ofcom and the PSR conducted case-study interviews with communications and financial services stakeholders between April and June 2014. This case-study-based approach ensured that we were able to capture the unique perspectives of various firms and to understand in detail the types of payments innovations currently available and/or in development. The stakeholders we spoke to do not represent an exhaustive list of all players involved in payments innovation. Instead, they represent prominent innovators from the communications and financial sectors.
- 3.16 From the communications sector, stakeholder meetings were held with mobile network operators (MNOs), smartphone manufacturers, operator billing providers, business-to-business communications providers and digital security providers. From the financial sector, stakeholder meetings were held with card networks, interbank operators, providers of collaborative innovations and prominent disruptors to traditional payment methods and channels.
- 3.17 Ofcom led the research and analysis related to communications firms, while the PSR led the work related to financial services firms.

⁵ HM Treasury, Opening Up UK Payments, March 2013, <https://www.gov.uk/government/consultations/opening-up-uk-payments>

Section 4

Industry context

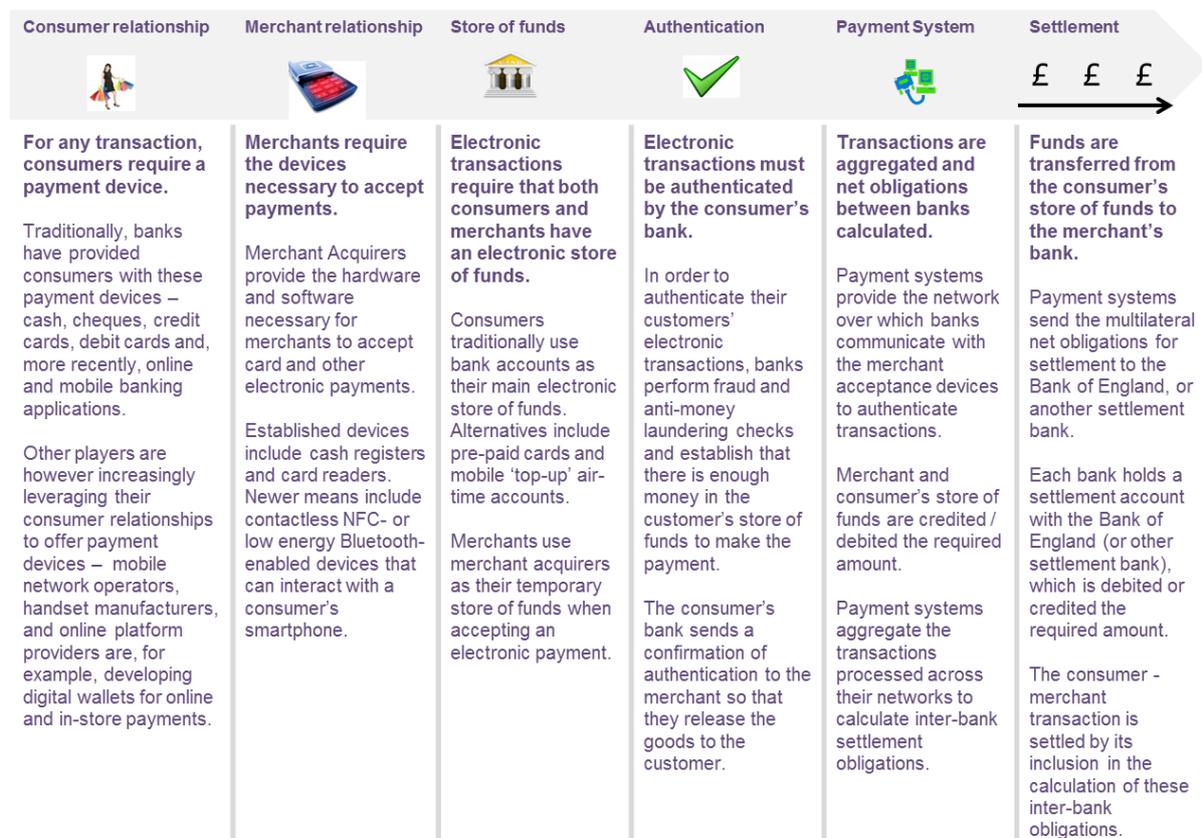
4.1 In this section, we provide the industry context for innovation in payments, describing:

- the payment transaction process;
- the types of players contributing to payments innovation;
- the regulatory landscape;
- the role of partnerships; and
- payment trends and the continued shift to electronic methods of payment.

To understand payments innovation, it is helpful to describe the transaction process

4.10 Figure 1 below shows the processes involved in a successful payments transaction.

Figure 1: Processes in a successful transaction



Source: Ofcom / PSR

Players from various sectors contribute to payments innovation

4.11 Figure 2 below shows the payments value chain divided into three components.

- **Consumer facing front end:** including the devices and apps/wallets for consumers to initiate and merchants to accept payment.
- **Financial institutions:** these connect consumers and merchants through their banking and acquiring relationships, and store consumers' and merchants' funds.
- **Payment systems:** these transmit and process transactions.

Figure 2: Illustrative payments value chain



Source: Ofcom / PSR

4.12 The products and services they provide can be split into seven categories.

- **Consumer devices:** much of the innovation in this area involves enabling smartphones for interaction with merchant POS devices, often using NFC technology. A range of players from different sectors are active in this sector, including card networks (e.g. Visa, MasterCard and American Express), handset manufacturers (e.g. Samsung and Apple) and MNOs (e.g. Everything Everywhere and Vodafone).
- **Merchant devices:** Firms like Ingenico and Verifone produce traditional card readers and are also creating contactless devices to facilitate new methods of payment acceptance. Meanwhile, firms like iZettle, Payleven and Square are marketing POS card acceptance hardware to small merchants, who have traditionally found the cost and complexity of card acceptance to be prohibitive.
- **Wallets / Bank apps:** card networks (e.g. Visa, MasterCard), communications firms (e.g. Everything Everywhere and Vodafone), financial institutions (e.g. Barclays) and online players (e.g. Google) are creating consumer-facing software to facilitate payments. Wallets allow customers to hold multiple sets of card or bank account details online and/or on their smartphones. They can be used to initiate and authorise online or physical transactions, as well as facilitating offers, vouchers, marketing and other merchant-customer interactions. Banking apps allow consumers to make payments from their smartphone, e.g. through Paym.
- **Merchant acquirers:** Firms such as Barclaycard and WorldPay handle the merchant side of payments processing, and can add value to a business' in-store experience by creating faster, more interactive or more informative payments solutions.
- **Card or e-money issuers (e.g. Capital One and PayPal) and account providers (banks):** the institutions which hold and authorise the release of customers' funds can innovate around the terms and technologies they offer, e.g. through offering reward mechanisms or NFC-contactless cards.

- **Primary payment systems:** Card networks (e.g. Visa and MasterCard) and interbank payment systems (e.g. Faster Payments) are the primary systems across which payments can be authorised and cleared. They also keep a record of the overall amounts owed to / by each of their members and periodically send a set of multilateral net obligations to be settled between accounts held at the Bank of England, or less typically, a clearing bank.
- **Overlay payment systems:** There are a variety of overlay payment systems currently operating, as well as several in development. Overlay payment systems vary in their similarity to primary payment systems, but typically provide some additional services. For example, Paym links mobile numbers with bank accounts, allowing consumers to pay each other by entering the recipient's mobile phone number. Some overlay payment systems, such as PayPal, clear transactions themselves using e-money, which can be bought or sold using primary payment systems.

The regulatory landscape is complex

- 4.13 The regulation of payment systems in the UK is carried out by a number of organisations whose remits derive variously from European and domestic UK law. These regulatory entities include the Bank of England, the Competition and Markets Authority (CMA), the Financial Conduct Authority (FCA), the Information Commissioner's Office, PhonepayPlus and the PSR.
- 4.14 The interests of these bodies range from overseeing competition in the payments industry, consumer protection and the resilience of the payments infrastructure. There is also regulatory interaction; for example, the CMA, FCA, Information Commissioner's Office, PhonePayPlus and PSR all contribute to consumer protection in UK payment services.
- 4.15 This leads to a complex regulatory landscape which, as we discuss in section 6, can reduce incentives for payments innovation.

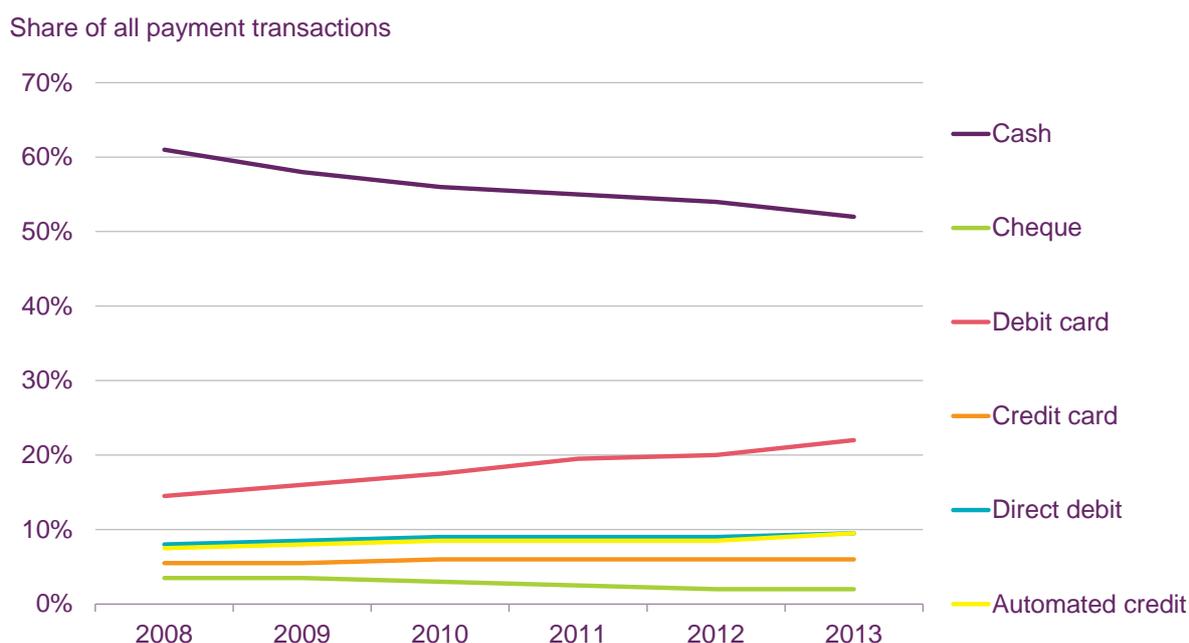
Partnerships are key for some payment innovators

- 4.16 The complexity of the payments value chain makes partnerships key to some payments innovators. Some firms who wish to offer a new innovative service are unable to build a solution at every stage of the value chain and therefore partner with firms active in other stages. Regulation also plays a role in partnerships, as communication firms may prefer to partner with financial services firms in order to benefit from their existing relationships with financial regulators without needing additional authorisations.
- 4.17 In some instances partners have competitive offerings. EE's Cash on Tap service for example, is in partnership with MasterCard, which has its own digital wallet, MasterPass.

The electronic payments sector is expanding

- 4.18 Figure 3 below shows the relative trends in UK payment transactions over time.

Figure 3: UK payment trends



Source: Payments Council – UK Payment Statistics 2014

- 4.19 The data shows that the proportion of transactions made using cash is decreasing by a compounded annual growth rate (CAGR) of 2.5 percentage points a year, to around 52% in 2013. From 2008 to 2013, debit and credit card transactions increased by 9.2% and 2.9% annually respectively, and in 2013 collectively accounted for 27.9% of all payment transactions having only accounted for 19.8% in 2008. The volume of direct debit and automated credits⁶ increased by a CAGR of 2.8% and 3.8% annually respectively between 2008 and 2013⁷.
- 4.20 The British Retail Consortium (BRC) reports that the volume of non-cash non-card retail payments⁸ is small but growing fast. Having accounted for less than 0.1% of retail payments⁹ in 2010, they accounted for 5.8% in 2013 (1.75% of retail sales value). PayPal is one of the largest sources of these alternative payments, with more than 19 million UK accounts. According to BRC, non-cash non-card payments are currently largely confined to relatively low-value transactions, with the average transaction value at only £5.45 (down from £6.66 in 2012)¹⁰.

⁶ Includes Bacs Direct Credits, Bacs standing orders, Faster Payments Service, CHAPS and in-house standing orders and remote banking

⁷ Payments Council – UK Payment Statistics 2014

⁸ Total for all other payment types accepted at point of sale and/or internet that are not categorised as cash, debit card, or credit/charge cards

⁹ Payments made by debit card, credit/charge card, cash, and non-card payments at the POS, online, or through mail order. Does not include interbank payments

¹⁰ British Retail Consortium – Retail Payments Survey 2013

Section 5

Types of innovation

- 5.1 Widespread internet use, together with the growing penetration of smartphones and contactless payment cards amongst consumers is increasing the potential for new payments innovations. Today, over 60% of UK consumers have a smartphone¹¹, while around one third have a contactless payment card¹².
- 5.2 Despite potential concerns around security, which we explore in Section 7, the evidence suggests consumers are increasingly using their mobile phone for payments. In March 2014, 24% of mobile internet users had purchased goods or services from their handset, up from 20% in March 2013¹³.
- 5.3 Against this backdrop, communications and financial firms are developing several different types of innovations aimed at both consumers and merchants.

Consumer-facing innovations

Banking apps Mobile banking apps allow consumers to access banking services, including payments, from their smartphone or tablet.

Digital wallets Communications and financial firms have developed digital wallets that provide consumers with a store of funds which can be used to make payments, either online or in-store (using contactless technologies on mobile phones). PayPal was one of the earliest providers of an online 'digital wallet'; in the decade following its acquisition by eBay in 2002 it has provided the only large scale alternative to using debit or credit cards for internet purchases. It has since launched a smartphone app which can make in-store payments over the internet, using barcodes or picture payment, or (currently in the US only) via the PayPal Beacon (which uses Bluetooth Low Energy technology).

MasterPass (MasterCard) and V.me (Visa) are digital wallets provided by the card networks. They store the details of multiple credit, debit, reward, and charge cards, allowing users to make online purchases without needing to enter their card details or provide merchants with any personal financial information.

EE's 'Cash on Tap' application was launched in 2011 and allows customers with an NFC-enabled Android phone to pre-load funds from a credit/debit card and make contactless payments using NFC technology on enabled phones, which are authorised by the 'secure element' on the EE-issued SIM card.

O2 Wallet launched in 2011, building on a pre-paid card service, however this service closed in 2014 and O2 no longer has an own-branded payment service.

Vodafone launched its SmartPass mobile payments application in the UK in September 2014, allowing users to make contactless payments from a pre-

¹¹ Ofcom consumer research, Q1 2014 (61% of UK adults claimed to own a smartphone)

¹² UK Cards Association

¹³ Ofcom, Communications Market Report 2014, Fig4.57, p297

loaded account on compatible NFC-enabled Android phones.

Weve is a joint venture between EE, O2 and Vodafone UK to develop a mobile commerce platform. Plans to launch its 'wave and pay' service did not go ahead. Instead, the mobile networks have chosen to focus on their own payment services.

In September 2014 Apple announced its mobile wallet and payments service, Apple Pay as part of its launch of the iPhone 6 and Apple Watch in the US¹⁴.

Integrated Payments	<p>Digital business models are developing where payments are integrated seamlessly, increasing convenience for consumers, for example:</p> <ul style="list-style-type: none">• iTunes offers a convenient way of making payments based on 'one-click' payments for registered users who had set up payments details – a model also used by app stores and Amazon.• Uber customers can use a mobile application to find the location of the nearest available car and driver, get an estimate of the cost, book it and pay for it.• Zipcar's app allows consumers to find, reserve, and pay for a hire car. Consumers can also use the app to unlock the car.
Mobile payment services	<p>Paym and Zapp are payments services backed by consortia of banks and use / will primarily use FPS to transfer money between user accounts.</p> <p>Paym allows consumers to make person-to-person payments using only their phone numbers. It does this using a database that connects phone numbers with bank account details. The service is integrated into the consumer's mobile banking app.</p> <p>Zapp, when launched, will allow consumers to make online payments to retailers from their bank accounts using Faster Payments. It therefore represents an alternative to using a debit or credit card.</p>
Operator billing	<p>MNOs can charge for low-value digital goods and services via the phone bill. Operator billing has recently expanded into app stores (e.g. Google Play). MNOs, alongside aggregators such as Boku and Bango, are exploring opportunities for further expansion, potentially including sale of low value non-digital goods.</p> <p>Intermediaries such as Boku and Bango mimic many of the functions played by the merchant acquirers in card networks – they handle the merchant relationships and provide platforms that integrate and combine the operator billing services from multiple MNOs. In addition to facilitating the relationships between MNOs and merchants, some intermediaries hold funds and play an aggregating function: collecting money owed from MNOs to merchants and paying it out in batches.</p>

¹⁴ <https://www.apple.com/pr/library/2014/09/09Apple-Announces-Apple-Pay.html>

Payments-enabled handsets Some smartphone manufacturers, including Samsung and Apple, have developed NFC-enabled handsets capable of making contactless payments in-store. Other technologies, such as Bluetooth Low Energy can also be used for in-store communications between merchants and consumers.

Handset manufacturers are also enabling authentication by including thumb or fingerprint scanners on their devices. Handsets may also offer an alternative to MNO-controlled authentication via device-embedded hardware (secure elements) or by supporting cloud based authentication (i.e. Host Card Emulation) in their operating systems. However, handset manufacturers may not be able to use their secure elements to build effective mobile wallet propositions due to pressures from the MNOs who are both their largest customers, as well as their competitors in the mobile wallet space.

Merchant-facing innovations

Enhanced data analytics Merchants can benefit from the incorporation of advanced data analytics into new payment innovations. This data can, amongst other uses, help merchants to measure the effectiveness of marketing campaigns, pricing strategies and store layouts.

In-store services Players such as PayPal are providing merchants with the ability to incorporate payments into new in-store experiences which use smartphones to improve merchant-consumer interaction. This has the potential to improve both a merchant's brand and their knowledge of their customers.

Personalised offers and advertising Mobile wallets offer the opportunity for merchants to increase their levels of targeted advertising. Payment innovations can use enhanced data analytics to help merchants to target offers and advertising to consumers' smartphones.

POS developments Many UK retailers are deploying contactless card readers in stores. mPOS devices are also being bought by smaller merchants who have traditionally found electronic payment acceptance to be too complex and costly. iZettle, PayPal, WorldPayZinc and others are providing merchants with these devices, which often work by plugging the mPOS into a smartphone or tablet.

Section 6

Incentives for and barriers to innovation

6.1 In this section we outline the incentives for payments innovation and discuss the types of barriers that may be hindering payments innovations. We also discuss the particular barriers which may be hindering non-bank payments innovation.

Incentives for payments innovation

6.2 Our stakeholder meetings highlighted three means of increasing revenue which incentivise communications and financial firms to develop payments innovations:

- 1) increase existing payments revenue streams;
- 2) create new payments revenue streams; and
- 3) improve customer retention and acquisition.

Increase existing payments revenue streams

6.3 Innovative payment solutions offer communications and financial firms the opportunity to increase their existing revenue streams, by reaching new customers, retaining existing customers, or selling more to existing customers. Examples include WorldpayZinc offering mPOS solutions to new groups of smaller merchants, or card issuers offering contactless cards to increase transactions and obtain more interchange revenues.

6.4 Fear that failure to implement a solution may lead to a loss of customers may drive financial and communication firms to offer a payment solution that brings them little revenue or benefits. If one bank fails to offer Paym, for example, customers may switch to a bank that does. This may lead to banks offering Paym despite the fact that it does not provide them with a direct revenue stream.

Create new payments revenue streams

6.5 New revenue streams created from innovative payments include those from 1) new fee-based revenues; 2) advertising and cross-selling revenue; and 3) data monetisation.

- Fee-based revenues: innovations based on Faster Payments and operator billing offer new fee-based revenue streams, similar to those available through the card networks. Growing these alternative revenue streams might be of particular interest to financial institutions concerned about expected European Commission interventions on interchange fees.
- Advertising and cross-selling revenues: Both communications and financial firms may gain revenues through linking their innovative payment solutions with advertising. Additionally, innovations such as Paym, which are accessed via a bank's mobile banking app, may lead to higher cross-sales of other financial products due to higher app use.
- Data monetisation: Payments innovations present an increased opportunity for data monetisation through integration of payments with other customer data.

Merchant acquirers, for example, could use data gained through provision of innovative payment propositions to sell merchants advanced data analytics.

- 6.6 Of these new revenue streams, fee-based revenues may be the easiest to create and capture due to the similarity of this model to the traditional card-based model. The success of advertising and data monetisation, however, depend on the level of consumer opt-in and whether data privacy issues can be overcome.

Improve customer retention and acquisition

- 6.7 Through provision of innovative payment solutions, communications and financial firms may also wish to enhance their brands and improve customer loyalty, thereby improving or protecting non-payments revenues. It may be the case, for example, that customers are less likely to switch mobile network operator if doing so would mean losing the digital wallet services currently provided for them by that operator. Similarly, if customers value a payment service provided by their bank's smartphone app, they may be less likely to switch bank.
- 6.8 Fear that failure to implement a solution may lead to a loss of customers may drive firms to offer a payments solution even if it offers little direct revenue. For example, the incentives for some banks to participate in Paym may be rooted in concern that, if they do not offer Paym, customers may switch to a bank that does.

Barriers to payments innovation

- 6.9 Our stakeholder meetings pointed to four types of challenges that were limiting innovation:
- 1) incentive alignment;
 - 2) network effects and scale requirements;
 - 3) regulatory and technological uncertainty; and
 - 4) security and resilience requirements;

Incentive alignment

- 6.10 The incentives driving take-up and development of payment innovations do not always align across consumers, merchants, communications firms, and financial institutions. For example, Zapp shows customers their bank balance prior to any payment authorisation, allowing them to budget more effectively. However, this may reduce merchants' incentives to adopt Zapp, as customers may abandon transactions after seeing their bank balance.
- 6.11 The British Retail Consortium (BRC) told us that many merchants are inadequately incentivised to invest in acceptance of new payment methods due to a perceived lack of interest from innovators to truly understand merchant needs. Merchants argue that payments propositions tend to be presented to them as finished products, rather than providing them with the flexibility necessary to build payments solutions into tailored in-store experiences which suit their customer base. This lack of collaborative design may be limiting the roll-out of some payment innovations.
- 6.12 Similar issues appear due to the major UK banks' ownership of the interbank payment systems. Collective action is therefore required to invest in existing payment

systems and develop new payment systems. For this to happen, each bank must have an individual incentive to invest. In the past, external forces have played a role in innovation. Treasury noted in its consultation “Setting the strategy for UK payments”¹⁵ that “the development of the Faster Payments Service was driven in 2005 by pressure from the Office of Fair Trading and HM Treasury” and that “the development of payment services across the industry has at times been slow”, citing the longer-than-anticipated process of delivering Faster Payments.

Network effects and scale requirements

- 6.13 Network effects exist when the value of an innovation to its users depends on the size of the network. Paym, for example, represents a proposition where a number of bank and building societies partnered to achieve a large network. Consequently, it will be available to the majority of the UK banked population, thereby increasing its value to each user by increasing the size of the Paym user-base, and therefore the number of potential senders / recipients.
- 6.14 These effects influence the decisions of merchants when deciding on whether to adopt a new payment method. Each new payment method a merchant wishes to accept incurs a cost (new hardware, software, staff training, etc.). It is therefore in merchants’ interests to wait until they are certain that a particular proposition will succeed with consumers before investing in its acceptance. This can result in a ‘chicken and egg’ problem for new payments innovation.
- 6.15 We were also told that scale requirements and the need to invest considerable sums, are often an important issue in payments innovations. Horizontal, intra-industry partnerships, such as the Weve joint venture between the UK’s three largest MNOs, can help address these issues.

Regulatory and technological uncertainty

- 6.16 Stakeholders reported that regulatory uncertainty was constraining current investment, citing several examples.
- 6.17 **Interchange fees:** On 24 July 2013, the European Commission published a proposal for a Regulation of the European Parliament and Council on interchange fees for debit, credit and card-based payment transactions. The Regulation is still going through the EU legislative process, but could be adopted before the end of 2014, with some or all of its provisions coming into force in mid-2015. However, the exact scope and content of the Regulation may change up to its adoption. As a result, stakeholders reported that merchants may be reluctant to invest in new payment acceptance methods until they knew with certainty what card fees would be set at, and how this would compare to alternatives like PayPal and Zapp.
- 6.18 **Payment Services Directives:** MNOs and providers of operator billing platforms said investment had been constrained by uncertainty regarding the interpretation of European Union law on payment services. Specifically, the Payment Services

¹⁵ HM Treasury – Setting the Strategy for UK Payments, July 2012, <https://www.gov.uk/government/consultations/setting-the-strategy-for-uk-payments>

Directive¹⁶ as implemented in the UK by the Payment Services Regulations 2009¹⁷ essentially allows MNOs to charge for digital content through the phone bill without being regulated (referred to as the “digital exemption” in the rest of this document)¹⁸. MNOs reported that in addition to a lack of clarity around the scope of the current digital exemption¹⁹, there has been significant uncertainty about how this exemption may change under a proposed future Payment Services Directive (“PSD2”). There have been concerns that the digital exemption would be removed, as well as suggestions that the exemption could be widened to allow the sale of low value physical goods.

- 6.19 **PSR:** Lastly, with the creation of the new PSR, stakeholders noted that actions that the regulator may take in exercising its innovation objective could impact strategic investment and planning decisions. The PSR intends to issue Annual Plans and to provide as much forward guidance as possible on its expected plans and actions.
- 6.20 Stakeholders also reported that a significant challenge to greater uptake of new payments innovations is that, at present, there are a number of competing technologies which can be employed. For example, NFC has long-been touted as the most likely technology for innovative POS payment propositions, and many mobile handsets and a variety of current services based include this technology. However, stakeholders revealed that despite this early momentum, PayPal, Samsung and Visa were exploring alternative technologies, including Bluetooth Low Energy (BLE), QR/barcode scanning and biometrics. These alternatives could displace NFC.
- 6.21 Apple’s recent support for NFC in the iPhone 6 and Apple Watch may add some momentum to NFC take-up. Stakeholders had suggested that Apple’s lack of support for NFC payments in earlier iPhone models had slowed others’ enthusiasm for the technology.
- 6.22 Some firms may also be delaying investment in NFC wallets until there is greater certainty about the relative benefits of integrating with mobile operators’ payment platforms, compared to alternatives such as Host Card Emulation (which offers authentication via the Cloud).

Security and resilience requirements

- 6.23 Consumers see security as a priority issue in payments innovation, with 65% showing some concern about mobile payments security and 61% about contactless cards, compared with only 34% who are concerned about using debit cards and 33%

¹⁶ Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC, OJ L 319, 5.12.2007, p. 1–36

¹⁷ S.I. 2009/209

¹⁸ Under Schedule 1 Part 2 of the Regulations, it is expressly stated that the following activities are not payment services: “payment transactions executed by means of any telecommunication, digital or IT device, where the goods or services purchased are delivered to and are to be used through a telecommunication, digital or IT device, provided that the telecommunication, digital or IT operator does not act only as an intermediary between the payment service user and the supplier of the goods and services”

¹⁹ Under Article 3(l) of the Payment Services Directive

about credit cards²⁰. This makes security and resilience key requirements for any new payments proposition.

- 6.24 From an innovator's standpoint, certain providers noted the high requirements for security and resilience of payment systems as being excessively costly and burdensome to comply with, and could affect their decision on whether to invest in payments innovation.

Barriers to non-bank innovation

- 6.25 Stakeholders told us there were three particular challenges non-banks faced when innovating in payments: issuer wallet take-up, regulatory requirements, and trust.

Issuer take-up of wallets

- 6.26 Digital wallets developed by non-bank providers must be attractive to issuing banks if they wish to hold their cards (rather than operating a pre-paid model). Issuers are unlikely to share their interchange revenues with non-bank wallet providers if there are alternatives which maintain their revenues. Given that many banks own a share of Visa Europe and/or VocaLink, they might, for example, prefer to support V.me (Visa Europe) or Zapp (VocaLink).
- 6.27 Non-bank wallet providers may entice issuer take-up by offering a simpler, more secure proposition than their competition. This might be possible using the Secure Element – either on MNO SIM cards, or contained within the phone hardware. Apple Pay, for example, combines a secure element with a form of tokenisation and has gained widespread issuer take-up in the US. Issuer take-up of Secure Element-based mobile wallets may depend partly on the viability using Host Card Emulation as an alternative.

Regulatory requirements

- 6.28 A common theme in our discussions was the reluctance of communications firms to become regulated as financial institutions as they were concerned about the burden this would place on the remainder of the business. This applied to MNOs in particular, who were additionally concerned that telecoms products such as 'airtime' credit (i.e. voice minutes and data allowances) would come under financial regulation. This was a key reason why MNOs partnered with firms which were already regulated by the FCA when delivering payments services.

Trust

- 6.29 Consumer and merchant trust is important to the success of a new payments innovation. As new payments players, some non-bank innovators may find it harder to gain this trust than the banks that traditionally provide payment services: for example, according to The Logic Group / Ipsos MORI's *The Technology Landscape 2013* report, just 13% of consumers would be happy for their mobile to house their credit/debit cards²¹. Some non-bank innovators may however be able to leverage their existing brands to overcome this problem.

²⁰ 2014 Mintel study - http://www.mintel.com/press-centre/financial-services/consumer-paymentspreferences_uk

²¹ https://www.the-logic-group.com/UploadedFiles/TheLogicGroupMobileSurvey2013_201305223545.pdf

Section 7

Implications for consumers and merchants

7.1 In this section we describe the implications for consumers and merchants, looking at the potential benefits and risks associated with payments innovation.

Consumers – potential benefits

7.2 Payments innovators hope to drive consumer interest by providing them with one or more of four key benefits:

- 1) discount and loyalty offers;
- 2) improved security;
- 3) increased convenience; and
- 4) new in-store services.

Discount and loyalty offers

7.3 Innovations may offer consumers better value through deals, offers, loyalty programmes and price comparisons. Mobile wallet providers may allow these to be 'pushed' to consumers' m-wallet applications.

7.4 Mobile wallets may allow discount and loyalty offers to be tailored using smartphone enabled data such as location, previous spending habits, search history, etc. For example, the Starbucks' mobile wallet allows consumers to pay and redeem rewards and personalised offers.

7.5 However, stakeholders noted that such usage of personal consumer data for offers and loyalty programmes must be on an opt-in basis to ensure consumers do not have their privacy encroached upon. It remains to be seen whether customers will be enthusiastic about having such offers tailored using their personal data or 'pushed' to their mobile wallet applications.

Improved security

7.6 Mobile payments solutions may offer consumers greater security through use of smartphone authentication technology. Samsung, for example, allows consumers to authenticate payments through PayPal using a fingerprint scanner.

7.7 In the future, location services offered by smartphones might be used to better protect customers against fraud by requiring that card transaction locations correspond to a customer's smartphone GPS coordinates. Such usage of location services may raise legal issues around customer privacy.

7.8 Token-based payments innovations such as Zapp may offer consumers an increased level of security by not requiring them to share their financial details with merchants.

Increased convenience

- 7.9 Innovations offering a more convenient payment experience reduce the time and effort of paying. Contactless credit and debit cards, for example, allow customers to make instant in-store purchases of up to £20, without requiring them to enter a PIN.
- 7.10 New payments models are also improving the convenience of online payments. A key benefit of the Zapp service, for example, will be to allow registered users to make payments from their bank account without inputting account details; similarly services like Amazon 1-Click are based on making payment processes as simple and fast as possible.
- 7.11 Some new digital commerce models integrate convenient payment methods within their wider service offering. For example, services such as Hailo and Uber enable consumers to find, book and pay for taxis/cars using a smartphone application.
- 7.12 NFC mobile wallet propositions avoid the risk of card-clash, which occurs when more than one NFC chip is placed near a contactless reader. This can happen when a traditional wallet is placed on a contactless reader due to multiple cards, but does not happen with a smartphone.

New in-store services

- 7.13 Innovative in-store solutions may bring consumers an enhanced level of interaction with merchants. In-store solutions that allow for complex customer-merchant interactions such as using a smartphone to order food in-store, receive/accept offers, or pay remotely may lead to better customer service, more informed purchases and faster checkout times.
- 7.14 Innovative payment apps can provide additional services at the POS, such as showing bank balances, location, previous sales, electronic receipts etc. Zapp, for example, will show customers their bank balance prior to any payment authorisation, allowing customers to budget more effectively.

Consumers – potential risks

- 7.15 Stakeholders also told us that new payment innovations could create risks, highlighting four areas.
- **Confusion:** There is potential for the great variety of propositions, standards, and technologies in emerging payments innovations to lead to consumer confusion in terms of their functionality and how to use them safely.
 - **Exclusion:** There may be a risk of consumer exclusion if new payment methods are unsuitable for those lacking particular technical knowledge or confidence.
 - **Privacy:** There may be potential for consumers to feel that their privacy is being invaded by payments innovations that make use of personal data or location targeted advertising.
 - **Security:** If payments innovations are developed without sufficient regard to security then consumers could suffer increased risks (e.g. from fraud). It will be important that new technologies and innovations are properly tested before being released to consumers in order to increase consumer trust in internet payment services, and reduce payment fraud. The payments industry and policymakers

already work together on security issues. For example, the European Central Bank's has made recommendations for the security of internet payments and is consulting on recommendations for mobile payments, which were developed by the European Forum on the Security of Retail Payments (SecuRe Pay)²². The provision of consumer information is also important to ensuring that consumers minimise the risks they take. Ofcom has published a consumer guide to using apps safely and securely on mobile phones, which incorporates input from the FCA on the use of mobile banking and payments²³.

Merchants – potential benefits

7.16 Payments innovators hope to drive merchant acceptance of their payment methods by providing them with one or more of four key benefits:

- 1) Improved brand and in-store experience.
- 2) Reduced complexity;
- 3) Reduced costs; and
- 4) Simpler and faster payment process.

7.17 Across these benefits, merchants could potentially both reduce their costs (e.g. of acceptance), and increase revenues through increased sales. However, fears over customer retention may also drive merchants to accept payment methods favoured by consumers, even if those methods offer the merchant no additional incentives.

Improved brands and in-store experience

7.18 In our meetings, stakeholders identified three means by which innovative payments can enhance in-store experience, namely through: 1) enhanced data analytics; 2) enhanced merchant-consumer interactions; and 3) personalised offers and advertising.

- **Enhanced data analytics:** Payments innovations can provide merchants with improved customer data and analytics. For instance, certain providers have developed mobile wallet platforms targeted at banks, mobile operators and merchants that incorporate analytics, big data capabilities and recommendation features. Such wallet propositions can allow merchants to integrate payments with other customer data to measure the effectiveness of marketing campaigns, pricing strategies, and store layouts.
- **Enhanced merchant-consumer interactions:** Interactive payments innovations may enhance merchant brands and sales by incorporating payment into a better in-store experience with enhanced merchant-consumer interactions. For example, Wagamama has built its own branded customer experience into the

²² Recommendations for the Security of Internet Payments,

<https://www.ecb.europa.eu/pub/pdf/other/recommendationssecurityinternetpaymentsoutcomeofpcfina1versionafterpc201301en.pdf>

²³ <http://consumers.ofcom.org.uk/phone/mobile-phones/safety-and-security/using-apps-safely-and-securely/>

PayPal app, allowing consumers to browse its menu, order, and pay on their smartphones. As well as increasing throughput, merchants may also increase sales through this enhanced customer experience

- **Personalised offers and advertising:** Innovative in-store solutions may allow merchants to push targeted marketing, offers and advertising to consumers. Innovative utilisation of payments information can allow merchants to increase sales through targeted advertising. In the US for example, Gap has partnered with Visa to send customers who enrol in the Gap Mobile 4 U programme an SMS coupon when they use a Visa card in the same postcode as a Gap location.

Reduced complexity

- 7.19 Merchants can benefit from a reduction in the complexity of accepting electronic payments. For instance, mPOS solutions such as those provided by iZettle, PayPal and Square target small merchants with the offer of a simpler set-up, sign up process and fee structure, compared to traditional card-acceptance terminals.

Reduced costs

- 7.20 Innovations may reduce merchants' cost of accepting payments including cash handling, interchange fees, and staff training.
- 7.21 Zapp represents a competitive alternative to card-based payment methods as it will clear using the interbank payment system Faster Payments, rather than one of the card networks. The potentially lower fees associated with Faster Payments may allow Zapp to offer merchants cheaper cost of acceptance.
- 7.22 The competition arising from the increased choice of electronic payment methods available to merchants could drive down merchant card fees. Additionally, amongst these various methods of acceptance, merchants could steer consumers to the cheaper alternative (by enticing them with offers/discounts), thereby encouraging providers to compete on cost.

Simpler and faster payment processes

- 7.23 New payment methods can shorten customer queues through faster checkout experiences. For example, contactless cards reduce time spent at the till by eliminating the need for customers to input their PINs, which benefits merchants by reducing queues and increasing customer throughput. In July 2014, Transport for London stopped accepting cash on London buses, with all fares needing to be paid by contactless methods (Oyster cards, NFC-enabled bank cards, or NFC-enabled mobile devices) – an initiative which should reduce the time for boarding buses as well as remove the costs associated with accepting and handling cash payments.
- 7.24 Innovative payment solutions such as Amazon 1-click, operator billing services MasterPass, PayPal, V.me and Zapp reduce the time and complexity of online payment, relative to entering card details, billing address and postage details on the merchant's website. These innovations, by simplifying the payment process, increase conversion. According to Zapp, in an average e-commerce/m-commerce checkout, a 10% conversion dropout occurs at each stage of authorisation. Zapp found there were 11 steps in a typical card checkout process, compared to around five for its process.

Merchants – potential risks

7.25 Through our stakeholder meetings, we identified four potential risks that payment innovations might pose to merchants:

- 1) higher transaction costs;
- 2) liability issues;
- 3) security issues; and
- 4) wasted investment and additional costs.

Higher transaction costs

7.26 While payments innovations have the potential to lower transaction costs for merchants, some may fear that they will become locked into expensive fee structures if acceptance of a particular payments innovation becomes a 'must have' for consumers.

Liability issues

7.27 New payment acceptance methods can shift fraud liabilities. Merchants may be wary of any payment innovations that shift the liability onto them or their customers.

Security issues

7.28 While innovative payment acceptance methods can increase security for merchants, for example, by not requiring them to safely hold customer card details (i.e. tokenisation), new systems can create novel security issues.

Wasted investment and additional costs

7.29 Acceptance of new payment methods can require substantial investment in equipment and staff training. Given the large number of payment innovations currently available, investing in any one new payment innovation carries the risk that that method will fail to achieve widespread consumer adoption, and that the investment will have been a waste. This risk may lead to merchants holding off on investment in any payments innovation until they are convinced that that innovation will achieve widespread take-up.

7.30 Merchants might face additional costs if multiple payment innovations gain widespread consumer adoption and so become 'must have' payment options. Merchants who feel required to accept a large variety of payment options could potentially risk slower check-out times in addition to higher hardware and staff training costs.

Section 8

Conclusions and next steps

8.1 In this final section of the report, we draw on our stakeholder meetings to present our views on the current state of innovation in payments, and the key developments which may shape innovation in the future. We describe areas that may warrant consideration to further enable innovation and competition where appropriate. Finally, we set out the next steps for Ofcom and the PSR.

State of innovation in the UK

8.2 The UK payments landscape is currently in a period of considerable change with the new technological opportunities offered by smartphones and contactless technologies such as Near Field Communication (NFC) encouraging a wide range of players to develop payments innovations, particularly at the consumer-facing 'front-end'. Current innovators include firms from the financial sector (i.e., banks, card networks, payment infrastructure providers), as well as firms from the communications sector including MNOs, handset manufacturers, online platform companies, and digital security firms.

8.3 The consumer and merchant-facing propositions summarised below highlight the considerable degree of innovation in the UK:

- **Consumer-facing propositions:** Payments innovators are developing solutions for person-to-person (P2P) and person-to-business (P2B) payments both online and using smartphones. These solutions are in various stages of development, with some already released. P2P propositions (e.g. Visa Personal Payments – online; and Paym – smartphone) are aimed primarily at replacing small P2P cash and cheques transactions. P2B propositions (e.g. V.me – online; and 'Cash on tap' – smartphone) aim either to increase the convenience and/or security of P2B payments; or to integrate payments with discount and loyalty offers and/or new in-store services.
- **Merchant-facing propositions:** Several innovators are developing merchant-facing solutions to enable or improve electronic payment acceptance. mPOS devices aim to offer smaller merchants a simpler and cheaper method of card acceptance than offered by traditional card readers. More complex merchant solutions (e.g. PayPal app and PayPal Beacon) aim to integrate payment into an improved in-store experience in which smartphones are used to facilitate more sophisticated consumer-merchant interaction.

8.4 The majority of the innovations described above use either the interbank systems or the card networks to clear and settle their transactions and are typically dependent on contracting with these systems. Non-bank innovators generally use the card networks, which are also developing their own payments innovations. Financial sector-led innovations are being developed using both card and interbank payment systems. Some innovation is enabled by changes to these 'back-end' systems: FPS for example, made changes to enable the implementation of the Paym service.

8.5 The card networks and interbank payment systems are enabling innovative consumer-facing payments services, but this implies many innovations by non-bank players are building on, rather than disrupting current payment systems.

- Innovations like Cash on Tap, Google Wallet and Vodafone SmartPass all use the card payment systems. Some of these, like Cash on Tap and SmartPass, take a small share of transaction fees.
 - Paym and Zapp are based on FPS. Zapp, for example, which will offer consumer-to-merchant payments, could provide competition to the existing card networks. Both Paym and Zapp are however owned by traditional financial sector players.
 - PayPal accounts are loaded from bank accounts, but if PayPal's (or another innovator's) network grows and it clears and settles more transactions internally, there is scope for it to disrupt existing payment systems.
- 8.6 More generally, this reliance on the existing payment systems (i.e. the card networks and interbank payment systems) could constrain the extent to which innovation might lead to price and service differentiation (e.g. card-based innovations must all operate within the Europay, MasterCard and Visa (EMV) standards and a card payment system's fee structure).

Key developments

- 8.7 We identified six key developments which we expect to influence payments innovations in the coming years: 1) Access to payment systems; 2) Alternative payment systems; 3) Enabling technologies; 4) Handset security; 5) Regulation; and 6) Tailored solutions.

Access to payment systems

- 8.8 The majority of current innovations leverage traditional payment systems (i.e., interbank payment systems or card networks). For example, MNOs collaborate with card networks when developing their mobile wallets, while initiatives such as Zapp and Paym utilise Faster Payments.
- 8.9 While our stakeholder meetings did not identify particular problems, given the need to utilise these payment systems, non-bank innovators would be disadvantaged if access to these systems is easier or better for banks than non-bank innovators. The launch of new payments services from communications firms is sometimes reliant on the ability to agree terms with firms which have developed their own competing propositions. For instance, the card networks have their own competing wallet propositions (e.g. V.me and MasterPass).

Alternative payment systems

- 8.10 Communications firms and other non-bank innovators have developed a number of alternative payment systems. By developing innovations using one of these alternatives, non-bank innovators could reduce their reliance on traditional payment systems and players, and disrupt the payments ecosystem that exists today.
- 8.11 PayPal's digital wallet offers an alternative to card and interbank payment systems by clearing transactions across its own books using e-money. This e-money must still however, be purchased using primary payment systems.
- 8.12 Crypto-currencies operate separately from other payments systems. - Bitcoin has the highest profile and is accepted by some retailers.

- 8.13 Operator billing offers an alternative to traditional payment systems for some digital goods by allowing their price to be either added to monthly mobile phone bills or debited from the consumer's pre-paid air-time account. MNOs currently provide operator billing services only within the scope of a 'digital goods exemption' in the Payment Services Directive. While operator billing could provide a broader alternative to traditional payment systems (i.e. for purchase of physical goods), this might cause MNOs to be subject to financial regulation, which they appear unwilling to do. The likelihood that communications players develop operator billing further will therefore depend on their appetite to take on the burdens of financial regulation, or to develop a business model in which that requirement is no longer relevant.
- 8.14 M-Pesa and m-Shwari are international examples of where communications players have become financial institutions in order to provide wide-ranging payment services, using their own systems for clearing.
- 8.15 Major online platform providers such as Apple, Amazon, Facebook or Google could potentially create disruptive alternatives to traditional payment systems.

Enabling technologies

- 8.16 There are currently a number of technologies that are or could be used in payments innovations. These include NFC, Bluetooth low-energy, HCE, barcodes, Wi-Fi, and QR codes. Uncertainty around which of these technologies will gain widespread adoption may be discouraging investment in innovations that rely on a particular one. The emergence of one or a number of widely accepted technologies might increase investment in and take-up of payments innovations.

Handset security

- 8.17 In the future, access to the mobile phone secure element may become important for firms seeking to provide mobile payments services. The secure element (a chip-set on the device or on the SIM card which links to the NFC chipset) put in phones by hardware manufacturers and/or MNOs is one way to store financial data for mobile payments. The ownership and control of these secure elements could therefore be a major asset in mobile wallet competition.
- 8.18 Handset manufacturers may not be able to use their secure elements to build effective mobile wallet propositions due to pressures from the MNOs who are both their largest customers, and their competitors in the mobile wallet space.
- 8.19 If financial players wish to access these secure elements when developing mobile payments applications, they will need to agree SIM rental or partnership arrangements with the MNOs or hardware manufacturers who control them. However, financial institutions and Google are investigating alternative ways to securely store financial data for mobile payments. Host Card Emulation (HCE), for example, involves storing consumer's financial details in the cloud and communicating with the mobile device over the internet.

Regulation

- 8.20 Changes to payments regulations are likely to influence the development of payments innovations in the next few years. The interchange regulations being considered by the European Council propose caps on interchange fees that would most likely affect the revenue models of many card-based innovations. PSD2 may

also affect the incentives to innovate. For example, any change to the digital exemption clause might alter the scope of operator billing offered by MNOs.

- 8.21 Also under consideration within PSD2 are proposals to regulate third party payment providers who use consenting consumers' online banking login details to gain access to their online bank accounts – allowing them to retrieve information or initiate payments on the consumer's behalf. If enacted, this may improve the security and consumer protections around these services, thereby encouraging their use. Third party payment providers could potentially be used to create payment innovations that avoid the traditional charges for merchants associated with accepting card payments. However, there are many challenges (e.g. ensuring that security and privacy are not compromised), which need to be overcome if these services are to provide benefits to consumers
- 8.22 The PSR is reviewing payment system operators' access and governance arrangements and their impact on competition, innovation and service users.

Tailored solutions

- 8.23 In order for any payments innovation to be successful, it will have to offer innovators the commercial incentive to develop it, customers sufficient benefits to use it and, if it is a P2B offering, merchants sufficient incentive to invest in its deployment. Where there is substantial variation in consumer or merchant demand, mass adoption of any individual proposition may be inappropriate and/or impossible. Innovators are therefore likely to develop flexible, tailored propositions that address the specific payment needs of individual customers and merchants. For example, PayPal allows merchants to develop their individual in-store experience with the PayPal app environment.

Further considerations

- 8.24 Much of the current innovation driven by the combination of communications technologies and payments services is at the consumer-facing end, making use of the current payment systems and infrastructure. As such, these innovations currently present limited disruption to the established payment systems.
- 8.25 This model of downstream innovation at the consumer end means that good outcomes for consumers continue to depend on well-functioning upstream payments systems. In this context, there are a number of areas that warrant consideration in support of good consumer outcomes and in particular as a further stimulus to potential innovation and competition where appropriate.
- 8.26 **Access to payment systems.** Direct and indirect access to payments systems are a key element of good end user outcomes. The PSR is consulting on proposals to improve direct and indirect access to payment systems. This may facilitate further payments innovations by both bank and non-bank players. As part of this, the PSR will expect payment system operators to continue to engage with the PSR and the Bank of England in order to consider ways in which to broaden access.
- 8.27 **The effect of vertical integration between retail banks, payments systems and the underlying payments infrastructure.** The presence of vertical integration between retail banking and payments systems may result in concerns around aligned incentives and the ability of third parties to enter or innovate in payments systems or services.

8.28 It may be the case that the structure of the industry could constrain the incentives for banks to invest in innovation in payment systems because:

- there is limited competitive advantage to be gained by investing in new functionality which would be available to all;
- banks may need to consider the impact of developing alternatives to card based innovations given their substantial interchange revenues;
- payments systems may be seen as cost centres rather than revenue drivers; and
- innovations may require complex co-ordination between competing players.

The PSR has considered issues of ownership and governance within its consultation paper, making a number of related proposals.

8.29 **The effects of financial regulation on innovators in payments services and systems.** Our stakeholder discussions identified some apprehension by potential non-financial services innovators to becoming regulated as financial institutions. Given the pace and scope of technological change, it is worth policy makers considering holistically what is an appropriate level of financial regulation for new entrants and innovators. Any such consideration would need to balance potential benefits from changes to financial regulation with the need to limit potential risks. One example of this is the FCA's 'Project Innovate', which includes an assessment of whether there are aspects of the regulatory system which pose particular difficulties for innovator businesses.

8.30 **Price controls on interchange rates.** The current European debate and activity on changing interchange fees may result in new business models in payments systems and services, and new or different relationships with innovators including communications providers. The PSR is expected to be the competent authority on UK interchange fees. This issue is covered within the PSR's consultation paper.

Next steps for Ofcom and the PSR

Ofcom

8.31 Ofcom will continue to engage with the payments industry if appropriate in order to ensure that the following are incorporated into its work plans:

- considerations of the availability, security and resilience of communications networks for the carriage of payment services;
- consumer protection issues in relation to the use of communications networks, services and devices for payments;
- any competition issues that may arise in the communications sector from the use of communications networks, services and devices in payments.

8.32 Ofcom has statutory duties under the Communications Act for the regulation of Premium Rate Services (PRS). It has appointed PhonepayPlus as the designated agency to deliver day-to-day regulation of services which fall under the current definition of PRS, which broadly sets a boundary as services paid via the communications network provider (e.g. via a phone bill). Ofcom approves PhonepayPlus's Code of Practice which outlines wide-ranging rules to protect

consumers and the processes PhonepayPlus applies when regulating the industry. It will work with PhonepayPlus and other organisations as appropriate to ensure that consumers are sufficiently protected and that consumers and suppliers can benefit from innovation enabled by new technologies and new consumer behaviour.

8.33 More broadly, where relevant to Ofcom's duties to further the interests of citizens in communications matter and consumers in relevant communications markets and where appropriate, Ofcom will assist and work with other regulators and policy makers as well as work with industry players to mitigate the risks we have identified where consumers could be adversely affected by payments innovation in relation to confusion, exclusion, privacy and security.

- **Confusion** – It is important that consumers have access to clear and trusted information about innovative payment methods and how to use them
- **Exclusion** – it will be important that the payments methods on which consumers rely are not replaced without regard to the usability of their replacements by the non-tech savvy.
- **Privacy** - It will be important that privacy laws are fully respected, for example, by providing opt-outs for targeted advertising
- **Security** - It will be important that new technologies and innovations are properly tested before being released to consumers in order to increase consumer trust in internet payment services, and reduce payment fraud. There are examples where the payments industry and policymakers are working together to ensure security considerations are sufficient: for example, the European Central Bank's has made recommendations for the security of internet payments and of mobile payments, which were developed by the European Forum on the Security of Retail Payments (SecuRe Pay).

PSR

8.34 A PSR consultation paper, scheduled for publication on 13 November, details policy proposals to address barriers to innovation by bank and non-bank innovators. In particular:

- **Access to payment systems** - the PSR is proposing to improve direct access to payment systems and require publication of information relating to access criteria, as well as introducing a code of conduct for indirect access. These proposals should facilitate access to payment systems for both bank and non-bank payment service providers, promoting competition and innovation in payments.
- **Incentives** – the PSR is making a number of proposals in relation to governance of the payment systems. This should widen the range of stakeholders who can influence the decisions taken by payment systems, leading to a closer alignment between the incentives of the payment system operators and those who use and seek access to the payment systems.
- **Regulatory uncertainty** – the PSR proposals will provide the industry with more clarity on its focus areas and objectives.
- **Consumer interests** – the PSR will set up a forum to focus on industry strategy, which will include service-user representatives. This will ensure that the industry

takes into account the views and concerns of those who use payment systems, including consumers (i.e. payment system end-users) when making any proposals which concern innovation in the payments industry.

Annex 1

Innovation from the communications sector

Introduction

- A1.1 Communications technology has been transforming the ways in which consumers manage their finances – data from the Payments Council shows that, in 2012, over 28 million UK consumers were using online banking, an increase of 9.4 million over the previous five years. Meanwhile around 14.2 million consumers were users of telephone banking²⁴.
- A1.2 However, transformational changes in the ways in which consumers make electronic payments have been slower to emerge. Bank-issued credit and debit cards remain both the main alternative to cash for proximity payments, and the primary payment method for online payments, despite the availability of digital wallets for over 15 years (PayPal for example, launched in 1999).
- A1.3 The mass adoption of smartphones (61% of UK adults in Q1 2014)²⁵ has the potential to transform consumer retail payments in the same way that the internet has transformed consumer retail banking. Players from the communications sector can be involved in payments innovations in providing technology enablers (for example in providing the network infrastructure over which payments services such as mobile banking are provided, or in the provision of hardware in mobile phones which enables contactless payments), or as developers of their own payment innovations such as digital wallets. If the benefits of innovation enabled by mobile technology and connected consumers are to be realised, firms from the communications sector are likely to have an integral role in developing and establishing the mobile phone as a payments platform.
- A1.4 In order to gain insight into the innovations being driven by communications players, as well as the enablers and constraints to the benefits of those innovations being realised, we met with a range of firms from the communications sector:
- Vodafone UK, O2 UK, Everything Everywhere and Three UK;
 - Weve (the m-commerce platform JV between Everything Everywhere, O2 UK and Vodafone UK);
 - Samsung;
 - BT;
 - Gemalto (a digital security company and provider of SIMs and bank cards); and
 - Boku and Bango (two of the leading aggregators of operator-billed content).

²⁴ http://www.paymentscouncil.org.uk/files/payments_council/paym/paym_white_paper_final.pdf

²⁵ Ofcom technology tracker, Q1 2014

There were some firms we approached but were unable to meet with, so for insight on these we have sought input from industry experts as well as our own desk research.

A1.5 In this section of the report we detail our key findings on the roles that firms from the communications sector are playing. We categorise them by three groups, all of which, to some extent, offer consumer-facing payments services: MNOs, mobile phone manufacturers and online platform operators (which include Google and Facebook).

Mobile network operators

A1.6 Our meetings with the UK MNOs found two distinct areas where they are active in payments services.

- **Contactless (NFC) payments and wallets** have been identified by MNOs (to differing degrees) as a growth area. Business models are based on using the Secure Element on the SIM to offer secure payments in physical stores and online.
- **Operator billing** (also known as carrier billing) is where the mobile phone bill is used to pay for goods and services. It is a well-established model for digital content sales that has evolved over 20 years, and UK MNOs see potential for it to extend more widely into digital content (for example in apps stores) and potentially beyond digital services. However, so far there has been limited evidence of innovation and revenues have recently showed slight decline.

A1.7 It was notable that operators treated the two as very separate, typically having different business units looking after each of them. It was also notable that, to date, MNOs have expressed little interest in investing in other innovative technologies which have the potential to drive the mobile phone as a payments platform, such as QR Codes, Bluetooth Low Energy or biometric authentication – this is likely to be because they do not see the same opportunities to play in the payments value chain as they do through leveraging their ownership of the customer's SIM card²⁶ or the customer's bill.

Contactless (NFC) payments and wallets

Propositions and types of innovation

A1.8 The same functionality that enables a contactless payment with a bank-issued credit or debit card can be incorporated into the SIM card of a mobile phone. An NFC-enabled SIM card can act as a 'Secure Element' that safely stores financial details and connects to the NFC chipset on the mobile phone using the secure and tamper-proof Single Wire Protocol. This enables MNOs (as well as third-parties partnering with MNOs to get access to the Secure Element) to provide applications

²⁶ Single Wire Protocol (SWP) has been developed as an NFC-only interface by ETSI and links directly from the SIM card to the Secure Element on the SIM card. Its security is based in part on working entirely outside the mobile operating system. It is not currently possible for the Secure Element to utilise other technologies such as Bluetooth Low Energy or QR Codes.

that enable customers to use their mobiles to pay at merchant NFC contactless terminals (of which there were around 190,000 in use in the UK in June 2014²⁷).

- A1.9 Key advantages over plastic cards include the potential for value-added services such as the ability for customers to check their bank balance before paying, or store and use retailer loyalty points. Other potential advantages include the avoidance of 'card clash', which can disrupt contactless payments made by physical wallets containing more than one payment card; greater security – as mobile phones are typically noticed as lost or stolen before bank cards; and greater convenience in that consumers will no longer need to carry multiple cards.
- A1.10 Like its physical counterpart, a mobile wallet can store both virtual cards and e-money.
- **Virtual cards** contain the same type of information as plastic cards, and allow payments to be made using card networks, such as MasterCard and Visa. This mode of payment is thus analogous to a 'traditional' card-based transaction. Customers using virtual cards, in effect, draw directly from funds in a bank account or on an established line of credit; and
 - **E-money** is stored as funds in a pre-loaded wallet account, therefore when a customer pays with e-money they do not draw directly from their bank.
- A1.11 UK MNOs have different approaches to offering NFC-enabled mobile payments services and wallets.

EE EE's partnership with Barclaycard to provide Quicktap (NFC Wallet) launched in 2012. The Cash on Tap application was launched in 2013 and allows customers with an NFC-enabled Android phone to pre-load funds from a credit/debit card and make contactless payments.

O2 The O2 Wallet was launched in 2011, building on a pre-paid card service launched two years previously. However, in 2013 O2 announced the closure of O2 Wallet along with the pre-paid card.

Three 3UK is the only MNO that is not part of the Weve JV. It does not have any public plans for launching NFC payments or other mobile payment applications.

Vodafone Vodafone launched the SmartPass mobile payments application in the UK in September 2014, having already launched it in Germany and Spain. It enables consumers to make contactless payments from a pre-loaded account on compatible NFC-enabled Android phones. A phone 'sticker' is also available, enabling customers without a

²⁷ UK Cards Association reported that in June 2014 there were 190,642 bank-owned terminals available in the UK where contactless cardholders can make a contactless transaction, http://www.theukcardsassociation.org.uk/contactless_contactless_statistics/index.asp

compatible NFC-enabled phone to make contactless payments. In the longer-term, Vodafone expect SmartPass to be just one component in a Vodafone Wallet which would also include access to bank cards and loyalty schemes.

- A1.12 In October 2012 the Weve m-commerce joint venture between EE, O2 UK and Vodafone UK launched a mobile platform comprising advertising and payments functions; however in September 2014 it announced that it was abandoning plans to pursue the payments element of the platform.

Business models

- A1.13 Partnerships with other players in the value chain are a characteristic of all of the MNOs' wallet and NFC propositions. In addition to partnerships with software suppliers (e.g. Monitise, CorFire) and trusted service managers (TSMs), (e.g. Gemalto, Oberthur), there are three types of strategic partnerships with other players in the payments value chain: between MNOs (i.e. Weve); with card networks; and with issuing banks.
- A1.14 The Weve joint venture was formed to leverage scale benefits in realising innovation in m-commerce. The rationale for Weve is in the scale efficiencies which enable players across the value chain (advertisers, merchants and potentially financial services firms) to invest once and integrate with all member MNOs (representing about 80% of UK mobile subscribers). Weve is a 'white label' platform on which MNOs build their own consumer propositions and develop their own partnerships with third-party players. Weve is also open to other MNOs and MVNOs using its platform (although none currently apply it).
- A1.15 However, in September 2014 Weve announced that it was abandoning plans to launch its NFC-based mobile payments platform. It had partnered with MasterCard and had been scheduled to launch mobile payments in 2015. Weve will now focus on mobile advertising and mobile payments, although it has said that it will continue to work on developments where Weve can help streamline the mobile payments process.
- A1.16 In the US, the Softcard m-wallet joint venture between the three largest MNOs has launched a mobile wallet proposition. It stores financial information on the secure element of a phone's SIM, and can support loyalty schemes as well as virtualised debit and credit cards. Responding to the perception of significant opportunity for growth, and the need to operate on an appealingly large scale, Softcard has enjoyed some success. The company announced that it added 20,000 new wallets every day of April 2014.
- A1.17 Partnerships with the card networks provide the MNOs with access to the necessary payments processing channels, as well as helping to drive merchant acceptance of their propositions. EE's Cash on Tap uses MasterCard, and Vodafone's SmartPass is in partnership with Visa. The ubiquity offered by the card networks, combined with the availability of NFC-enabled point-of-sale terminals is critical to MNOs' payment innovations being able to gain scale. The card networks also ensure high levels of security and resilience through the EMV standards with which all payments providers using their networks are required to comply.
- A1.18 MNOs also have partnerships with merchant acquirers and e-money issuers, who hold funds and take on the regulatory responsibilities associated with being a

provider of financially regulated products. Vodafone partners with Wirecard AG for SmartPass and Everything Everywhere with PPS for Cash on Tap. Some MNOs claimed that directly moving into the provision of financially regulated products was not a viable option, emphasising that the provision of financial services was not a core part of their business and that the benefits associated with directly offering such services would be outweighed by the implications of coming under the umbrella of financial regulation.

- A1.19 MNOs' partnerships with firms from the financial sector, and their reluctance to directly offer financial services is in part a consequence of the already highly evolved banking and payments sector in the UK – where only a small proportion of adults are unbanked²⁸ and which has the largest card payments market in Europe (accounting for one third of Europe's card payments). In this context, Vodafone – for example - does not see the same business opportunities or consumer benefits in investing in payments infrastructure as it has seen in other countries. Vodafone launched the M-Pesa service in Kenya in 2007 (in partnership with Safaricom) enabling customers to transfer money using their mobile phones. This service was designed to meet a demand for money transfer services where mobile phone ownership is high, but the availability and use of formal banking services is limited. M-Pesa has since rolled out to number of other countries including most recently Romania. There are no plans to extend this to countries with ubiquitous payments and banking infrastructures, such as the UK.
- A1.20 The revenue models for UK MNOs' mobile payments do not involve a fundamental re-structuring of the value chain. For those MNOs offering NFC payments applications the key prize is seen as a small share of the transaction fees – MNOs typically take a small share of the merchant transaction fee which they share with the merchant acquirer, the card network and the issuing bank (which takes the largest share – the interchange fee).
- A1.21 A second key source of potential revenues is from 'SIM rental', whereby third party providers pay to store consumers' financial details on the Secure Element of SIM cards.
- A1.22 In the longer-term, revenues from wallet products may also become significant – for example by offering retailers the opportunity to integrate payments propositions with their own promotions and loyalty schemes.
- A1.23 A final benefit that was identified was the value of wallets and financial services in building customer relationships and aiding retention – however, this was generally presented as an ancillary benefit, secondary to generating new revenue streams.

Challenges

- A1.24 MNOs mentioned a number of challenges to the success of their payments innovations. One issue is the necessity for these innovations to create a virtuous circle of demand, in which all parties (consumers, retailers, MNOs, and financial services firms) are adequately incentivised to take up the product. Critical success factors for MNOs' NFC and m-wallet innovations include:

²⁸ In 2011, c.770,000 or 1.5% of UK adults did not have access to a bank account. See Financial Inclusion Annual Monitoring Report 2011, p18 <http://www.birmingham.ac.uk/Documents/college-social-sciences/social-policy/CHASM/2013/Financial-inclusion-report-2013-final.pdf>,

- building consumer trust and driving consumer demand;
- technical integration and interoperability;
- building the base of consumers with NFC-enabled phones and NFC-enabled SIM cards; and
- putting the Secure Element on SIM cards at the centre of the mobile payments ecosystem.

A1.25 The MNOs, like the other stakeholders we met, emphasised the importance of consumer trust, and how well-publicised issues such as the ‘Heartbleed bug’ can seriously undermine consumer take-up. There was also recognition of how simple and user-friendly the payments process (from downloading an app, to loading it with funds, to making a payment) had to be. As one operator put it, one reason why card payments are so successful is their simplicity and to have any chance of success, mobile payments must be equally simple.

A1.26 Consumer scepticism around mobile payments is high, and MNOs may find it harder than financial firms to build consumer trust. According to Ovum’s 2013 Consumer Insights Report, just 6% of consumers trusted MNOs to deliver mobile payments compared to 43% who said they trusted banks and 13% who trusted credit card companies²⁹.

A1.27 Given these low levels of consumer trust in mobile payments and general consumer satisfaction with using existing payments methods³⁰, MNOs need to put significant investment into marketing payments services in order to drive take-up. For example, Everything Everywhere included marketing material with all handsets which support NFC payments and had an introductory offer whereby it loaded £5 into a customer’s Cash on Tap account then when they first downloaded the application, and another £5 when they first used it.

A1.28 Consumer demand will also be driven by habit. Data shows that while the UK is one of the world’s leaders in the availability of contactless point of sale payment devices³¹ and contactless cards³², consumers have been slow to embrace contactless payments, although there are signs of strong growth³³. Transport for

²⁹ https://www.the-logic-group.com/UploadedFiles/TheLogicGroupMobileSurvey2013_201305223545.pdf

³⁰ For example, according to research from the UK Cards Association, 87% of consumers reported to be happy with their main credit card, with only 4% dissatisfied (2009 research – note that this includes all aspects of credit card use, for example including repayments and interest), http://www.theukcardsassociation.org.uk/wm_documents/credit_and_store_cards_review_-_the_uk_cards_association.pdf, p201.

³¹ The British Retail Consortium’s annual Retail Payments Survey found that at the end of 2013 35.3% of all manned POS terminals now had the capability to accept contactless cards, a 53.3% increase on 2012, http://www.brc.org.uk/brc_show_document.asp?id=4451&moid=8156

³² According to data from the UK Cards Association, by May 2014 44.7m contactless cards had been issued, http://www.theukcardsassociation.org.uk/contactless_contactless_statistics/

³³ In May 2014, there were 22.1m contactless transactions in the UK – an average of less than 0.5 per card. However, this represented an increase of 18% from April 2014, and a year-on-year increase of 211%, http://www.theukcardsassociation.org.uk/contactless_contactless_statistics/

London is currently pushing contactless NFC payments: in 2012 the contactless Oyster card accounted for 80% of tube and bus journeys. From 6 July 2014 customers have not been able to pay with cash on London buses, with non-Oyster payments instead made by contactless payment cards and mobile phones. MNOs recognised this as being an important driver for consumer comfort with NFC payments. However, the transaction speed of NFC payments with phones is currently an issue: TFL requires each transaction to be processed in less than 500 milliseconds (its own Oyster Card is 300 milliseconds), which is a challenge for transactions based around the Secure Element on the SIM Card where software features (for example, to provide security layers and data collected by the MNO) mean that SIM-based NFC transactions are marginally slower than card-based NFC transactions.

- A1.29 Another limitation on drivers of consumer take-up is the £20 limit that is currently placed on contactless payments. This limits the liability associated with the increased fraud risk resulting from a lack of PIN requirement. However, next generation point-of-sale devices will address this by allowing contactless payments for higher values when accompanied with PIN authentication. Use of pre-loaded mobile wallets may also become more prevalent when auto top-up services are implemented (i.e. meaning that a consumer does not have to manually transfer funds from an account). Everything Everywhere has implemented Auto Load for its Cash on Tap service.
- A1.30 Delivering a simple and secure payments process is particularly challenging in a mobile environment characterised by multiple handsets and multiple operators. MNOs launching payments services emphasised the long development and testing cycles necessary to ensure that their services have minimal risks of failing or of consumer disappointment. Similarly, the EMV compliance requirements for the card networks to accept new payment types were recognised as being vital, but also requiring significant up-front and on-going resource commitments.
- A1.31 Although smartphone penetration has now exceeded 60% of UK adults, the base of consumers with NFC-enabled SIM cards and phones remains much lower.
- A1.32 NFC payments applications are generally restricted to high-end Android phones (Vodafone's way around this is to offer consumers who do not have an NFC phone a sticker containing an NFC chip, which they can stick onto their phones, allowing them to make payments using SmartPass). However, the numbers of consumers able to make NFC payments from their phones is likely to expand significantly following Apple's launch of the iPhone 6 in September 2014, with both versions of the phone, as well as the Apple Watch, having an NFC chip.
- A1.33 Apple's decision not to allow third-party access to the NFC chip, at least initially, will constrain third party developers from offering mobile wallet applications. This includes MNOs, who require access to the NFC chips on handsets in order to offer NFC payments.
- A1.34 The cost of NFC-enabled SIM cards is also restricting their roll-out – one operator advised that the cost of an NFC-enabled SIM card was around 4 Euros, roughly twenty times more expensive than for an ordinary SIM card. All of the MNOs therefore discriminate when providing consumers with NFC-enabled SIM cards.
- A1.35 Through their investment in NFC, MNOs hope to put the storage of financial details on their SIM at the centre of the mobile payments ecosystem. Without this, there is

a risk that MNOs are disintermediated entirely from the mobile payments value chain, as there are alternatives to SIM-based security and authentication.

- A Secure Element can equally well be a chipset on the mobile phone. Indeed NFC-enabled handsets typically do include a Secure Element. Until the launch of Apple's iPhone 6 these were generally used – transferring customer details when they change mobile phone can be an issue, and handset manufacturers may be reluctant to embrace a competitive alternative to SIM-based NFC, given that the mobile operators are their main customers. However, Apple's move into mobile payments changes this – Apple uses the Secure Element on its handsets to store encrypted proxies for consumers' card details. This uses a token-based system to request authorisation of payments. This 'tokenisation' method has been designed to increase security and reduce fraud risks, while another benefit is that it makes it simple for customers to have account details on multiple devices.
- Banks are set to offer mobile payments using the same standard two-factor IP-based authentication required to use mobile banking applications. When Zapp (a mobile payments initiative supported by five of the UK's leading retail banks) launches proximity payments (scheduled for 2015) it will utilise each customer's mobile banking app's authentication process.
- Host Card Emulation (HCE) is being backed by Google, Visa and MasterCard as a secure Cloud-based alternative to holding customer's financial data on the SIM or phone hardware.

A1.36 Some stakeholders reported that uncertainty about the future role of the SIM-based Secure Element is constraining investment decisions: mobile payments providers are reluctant to commit to integrating with MNOs when Host Card Emulation may present a better future alternative. Some also claimed that SIM-based Secure Elements might represent a constraint to innovation as a platform 'managed' by the MNOs, and that innovation will flourish in the future when HCE offers a secure open platform for the development of payments services.

Future developments

A1.37 We note that the four UK MNOs have different approaches. While Everything Everywhere and Vodafone are investing in their own services to exploit opportunities from the growth of contactless payments and the emergence of the mobile phone as a payment platform, it is notable that O2 has announced the closure of O2 Wallet and pre-pay card. Three have yet to publically announce their plans around mobile payments.

A1.38 If MNOs are to be at the centre of innovation in mobile payments there are two key dependencies: firstly that NFC emerges as the key technology for making mobile payments, and secondly that the Secure Element on the SIM is central to these payments being made. If these hold true, MNOs' position in the mobile payments value chain may be assured; however the business models they adopt and their role in driving innovation are uncertain. Key business decisions will include the extent to which they look to leverage ownership of the Secure Element into driving their own financial propositions (as Everything Everywhere and Vodafone are currently doing), and the extent to which they make the Secure Element available as an enabler for third parties to deliver their own payment services.

Operator billing

Propositions and types of innovation

- A1.39 Operator billing involves using a communications services bill as a means for paying for goods and services other than communications services themselves. Telecoms operators have been involved in offering payments services via operator billing for phone-based services (such as directory enquiries and chat lines) and digital goods for several decades. Theoretically operator billing provides an alternative to card networks or the interbank payments systems³⁴.
- A1.40 Established methods of paying for services via phone bills include premium rate telephone calls ('09') numbers and premium rate SMS services. More recently, developments such as 'Payforit' in the UK allow people to use websites to pay for online content, which is added to a user's mobile bill or deducted from their pre-pay balance.
- A1.41 PRS revenues have fallen over time as a result of the shift of digital content both towards "free" models (i.e. where the content is free to the consumer and the revenue stream is from other sources such as advertising) and towards models paid for through other payment mechanisms (such as credit card payments on app stores). Future growth in PRS will therefore largely depend on the ability of operator billing to compete with other forms of payment mechanisms for the purchase of low value goods and services, including but not limited to digital content.
- A1.42 In certain European countries (in particular France, Germany and Sweden) and in Japan and Korea, operator billing is an option for a broader range of goods and services, including parking, travel on public transport and in some cases payment for physical goods in shops³⁵.

Business models

- A1.43 There are generally two forms of operator-billed services:
- **On-portal services** – where the MNO acts as both merchant and biller; and
 - **Third party** – where services are charged to a user's phone bill but where the service provider is not the retailer of the good – a focus of regulated premium rate services. In some cases MNOs strike deals with app stores, including Google Play, Blackberry and Microsoft's Windows phone app stores.

³⁴ However, final settlement of consumer bills for post-pay consumers is reliant on established Payment systems, in particular direct debit, and cards or direct debit (in the case of automatic top-ups) may be used to purchase pre-pay credit. Cash may also be used to pay for mobile top-ups.

³⁵ For example, in some French cities such as Nice, users with an NFC handset can pay for local public transport up to €10 on their phone bill. In Scandinavia, 2012 20% of people in Stockholm were paying for bus travel via premium SMS. See: http://www.lignesdazur.com/presentation/?rub_code=82 and <http://www.afmm.fr/wp-content/uploads/2014/01/AFMM-European-benchmark-on-operator-billing-Payment-mechanisms-2012-EXECUTIVE-SUMMARY.pdf> In Japan, DoCoMo's DCMX Mini allow users to charge up to 10000 Yen a month (around £60) to their phone bills for in-store purchases made via NFC.

Opportunities for operator billing

- A1.44 Operator billing has two significant advantages as a payment mechanism for low-value goods and services:
- It is low friction (for example it does not require the inputting of card details) and therefore it may reduce consumer drop-out during the purchasing process and increase the conversion rate for merchants.
 - It is widely accessible, as you do not need a bank account or a credit card to use it.
- A1.45 While operator billing for digital content is well established in the UK, the mobile operators highlight it as having high potential value to merchants and consumers beyond digital low value payments, for example for transport tickets or vending machines.
- A1.46 This may be of particular interest for the estimated 12%³⁶ who do not have a bank account but who have a mobile (particularly teenagers). PhonepayPlus research that shows that the convenience of PRS as a method of payment is the most commonly cited (36%) reason for use among regular users of PRS. This is broadly consistent with the operator view of operator billing as a 'low friction' payment method.
- A1.47 These are not necessarily advantages which are unique to operator billing - other payment mechanisms are also increasingly becoming low friction and there are other alternatives (such as pre-paid gift cards) for those who want to make purchases but do not have a bank account or a credit card. Nonetheless the characteristics of operator billing as a payment mechanism and the recent agreements between Google and a number of MNOs to launch operator billing on Google Play suggest that it does have a significant role to play as a payments method for purchases of digital content.
- A1.48 The potential for operator billing may also go wider than just digital content. PhonepayPlus's research suggests that there is some consumer interest in using PRS services for physical goods and services. For example, 37% of current micropayment users said that they would be likely to use a service which billed their public transport tickets to their mobile phone. Other purchases of interest include using the mobile bill for a leisure activity (36%) and 'paying for car parks' (36%), though fewer (24%) said they would be likely to use a service which billed goods from a vending machine to their mobile bill³⁷.
- A1.49 While there is evidence of consumer interest in the use of premium rate services, PhonepayPlus' research found that among PRS-users, the widely known non-PRS payment systems tended to be most trusted by their users. For example, 84% of those using PayPal, Google Wallet or similar platforms to purchase digital goods and services said that they felt they are a safe way to pay, compared to 59% of

³⁶ Source: JMP Securities cited in <http://www2.lendprotect.co.uk/blog/2013/03/31/underbanked-and-possibly-overlooked-and-misunderstood/>.

³⁷ See http://www.phonepayplus.org.uk/For-Business/Research/~media/Files/PhonepayPlus/Research/Consumer%20Research/2013_Consumer_Engagement_with_PRS_2012_2013.pdf

users who felt that paying on the mobile internet via their phone bill was a safe way to pay.

Challenges

- A1.50 A lack of consistency for merchants may be a significant barrier to the development of operator billing in the UK. For merchants to invest in the acceptance of operator billing they need to be able to accept payments from customers of all mobile networks. The different speed at which MNOs have moved beyond premium SMS billing platforms (which have pre-defined price points) to flexible payment platforms has been noted to have constrained the evolution of premium rate services (PRS), and may slow its extension to non-digital services. One operator noted difficulties in co-ordinating activities between operators, or even agreeing interpretations of regulation for fear of such collective engagement being perceived as collusion. Some MNOs mentioned to us that they believed that operator billing had a low marketing profile in the UK.
- A1.51 The range of alternatives to operator billing may also constrain its take-up and growth:
- Operator billing is viewed by merchants as being relatively expensive – merchant transaction fees are significantly higher than for card payments, and the scope for them to fall is constrained by the commission that MNOs pay retailers for facilitating prepay top-ups (i.e. if an MNO is paying a 2.5% commission to a retailer for selling a pre-pay top-up, the fee the MNO charges for operator-billed service must be higher than 2.5% if it is to avoid making a loss – and this is on top of the fee charged by the aggregator (e.g. Boku or Bango).
 - The development of alternative low friction payment models, such as account-based models where consumers pre-register their credit cards with the online store and can then make frictionless purchases without having to enter their card details with each purchase.
 - Competition from accounts that allow users to pay for content without needing to disclose their card details to an unknown merchant (for example PayPal, or as is being developed by Zapp).
 - Competition from digital wallets where funds may be pre-loaded and payments can be made quickly even by consumers without credit/debit cards (for example, Google Play or iTunes gift cards, or PayPal).

Regulatory considerations

A1.52 There are a number of regulatory issues that will also play an important part in influencing how operator billing develops, in particular:

- 1) **The evolution of PhoneyPayPlus as a regulator of operator billing.** The PhoneyPayPlus Code of Practice is outcomes-based rather than prescriptive and is therefore flexible to industry developments.

PhoneyPayPlus is currently reviewing its Code and is looking for further ways in which it can be made future-proof. PhoneyPayPlus, while maintaining regulatory safeguards, has also recently launched a pilot scheme, with Google as the first signatory, which enables app developers using operator billing to be exempt

from the requirement in the Code to register with PhonepayPlus. This is an example of how operator billing can be safely encouraged.

Operators mentioned that they are keen for PhonepayPlus to continue taking a flexible and proportionate approach to the regulation of operator billing and avoid creating undue barriers to its development. However, one MNO expressed concern at what it saw as the burden arising from changes to the PhonepayPlus Code.

Where providers of operator billing are licensed electronic money institutions, they are also regulated by the Financial Conduct Authority (FCA).

- 2) **The scope of the EU Payment Services Directive (PSD).** PSD currently exempts the download of digital content where the payment transaction is executed from a telecom or IT device.

Interpretation of this digital exemption varies across Member States with some seeming to interpret a wider scope for the exemption and others requiring more entities within the operator billing industry to be regulated as payment services providers (PSP). Regulated PSPs can offer operator billing for non-digital goods.

The MNOs believe that being subject to financial services regulation would have prohibitive implications for the way they run their entire businesses. In particular the requirements to introduce certain anti-money laundering controls and measures to protect consumer balances (such as safeguarding accounts) would in their view be highly disruptive to the pre-pay business model. Similarly recommendations around secure payment authentication within the European Central Bank's (ECB) report suggest that payment systems should have consumer PIN authentication, something which would also be prohibitively expensive.

The MNOs are also concerned that the new payment Services Directive (PSD2) currently under negotiation in the EU may further narrow the scope of the digital exemption by requiring consumption of the download to be on the relevant device. Aggregators of operator-billed content were also worried about the uncertainty around the future of regulation in this area³⁸.

- 3) **Consistency of regulatory frameworks.** Operator billing and other types of payment service are currently regulated differently. Some payment service providers are regulated by the Financial Conduct Authority. This may lead to inconsistencies in consumer protection measures – for example, where a consumer buys an app on Google Play, their protection will differ depending on whether the payment provider is regulated by the FCA or by PhonepayPlus. This could result in an uneven playing field.

A1.53 MNOs view operator billing as having potential as a low-friction payment option for low value physical purchases (e.g. vending machines, parking and transport tickets). To date, in the UK, MNOs have launched several trials of this but there

³⁸ In particular about the possibility for a revision to the digital exemption which was proposed for the Payment Services Directive 2 which is currently being negotiated

have not been mass-deployments as these services would lie outside of the digital exemption.

- A1.54 Industry stakeholders told us that some EU countries have taken a different approach to the scope of the digital exemption under the PSD and this has allowed MNOs in those countries to offer operator billing for some physical goods.

Future developments

- A1.55 Many of the stakeholders we spoke with were concerned about regulation inhibiting their ability to innovate, particularly for the sale of low value non-digital goods including parking, transport tickets and vending machines and suggested that jurisdiction for all operator billing providers should be regulated by a single entity.
- A1.56 Intermediaries in the UK such as Boku and Bango currently focus on the provision of digital content. Although there is currently limited interest from aggregators in monetising the consumer data they collect, there may be opportunities for them to offer a broader range of services to MNOs and merchants.
- A1.57 In addition to managing MNOs' relationships with merchants, operator billing providers who have e-money or payment institution licences could offer payments for quasi-physical and physical goods without requiring their MNO partners to become financial services institutions themselves³⁹.

Other communications firms

- A1.58 In addition to MNOs, we have talked to and researched the activities of three further types of communications player who are active in developing innovation in payments:
- **Equipment manufacturers:** the providers of hardware to MNOs, for example Samsung, Apple, HTC and Sony who control elements necessary for the processing of a transaction.
 - **Online platform operators:** well-known internet brands, such as Google, Amazon, Facebook, Microsoft and eBay, who have a strong relationship with (and data-based knowledge of) consumers and who often require some form of payment mechanism during the course of business.
 - **Business-to-business firms** enabling communications technology to deliver innovation in payments.

Equipment manufacturers

- A1.59 Mobile handset manufacturers are an important gatekeeper for mobile payments processes; they are the party in the value chain that determines the technology to be incorporated into consumer equipment. NFC-based mobile payments, for example, require an NFC chipset in the phone. Manufacturers can also include an NFC-enabled Secure Element that allows secure storage of a consumer's financial

³⁹ In this case the intermediary would take on regulatory responsibility for compliance with the relevant financial regulations

details on the handset. Mobile phones can also include other payments-enabling hardware for authentication, such as fingerprint scanning modules.

- A1.60 In practice however, until Apple's inclusion of NFC on the iPhone6 and the launch of Apple Pay (initially only in the US) in October 2014, the direct involvement in providing payments services to consumers has been limited. This is in part because the main customers for mobile handsets from most manufacturers are the MNOs, who then sell them on to consumers, typically as part of a mobile connectivity package.
- A1.61 Until the launch of Apple Pay, MNOs had the most advanced payments propositions of all communications players, and could potentially stipulate that equipment manufacturers deactivate their own access to the secure element that was built into the handset so that there was no rival payments path to that via the secure element built into the MNO-supplied SIM card. The manufacturers do not necessarily see this as a problem, however, as the revenues they could conceivably drive from playing in the payments space are very small compared to the commercial contracts with MNOs that enable their equipment to be in the hands of the consumer.
- A1.62 With the exception of Apple, manufacturers have not generally looked to offer payments services directly, but have rather acted as enablers for innovation, and partnered with other players in order to realise this. For example, Samsung has developed fingerprint authentication on its Galaxy S5 which can be used to authenticate payments made via PayPal. Samsung also partnered with MasterCard on a mobile wallet during the 2012 Olympics, although this was more on a trial and proof-of-concept basis than a long-term proposition.
- A1.63 In the UK, phone manufacturers currently have little presence in directly offering payments services or m-wallets. However, Samsung operate a successful wallet product in South Korea and offer a similar application in the UK which is limited to vouchers and loyalty cards, and involves no e-money or card element.
- A1.64 However, the launch of Apple Pay (which launched in the US in October 2014, with launch in the UK likely to follow in 2015), together with the NFC-enabled iPhone 6 and Apple Watch may make Apple an industry shaper in contactless mobile phone payments. Our meetings with stakeholders were held before the Apple announcement, but a common theme of these discussions was that its technology choices and openness (or not) of its payment platform will have a significant impact on driving consumer behaviour and industry innovation.
- A1.65 Given the popularity of the iPhone, the high spending levels of its users and the integration with the iTunes platform (on which 800 million users have stored card payment details), Apple Pay may drive further investment in NFC-enabled terminals, and may have a significant impact on consumer take-up of mobile payments.
- A1.66 Future decisions from Apple on whether to allow access to the NFC chip to third party developers may shape mobile payments innovation. For launch there are no NFC application programming interfaces; this means that NFC capability is restricted to Apple Pay. Opening up access to the NFC chip would enable third parties to launch NFC based payment and wallet applications.

Online platform operators

- A1.67 To date, online platform operators have engaged with the UK payments space only to facilitate purchases of their own products – none, in the UK at least, have branched out into retail as a third party payments enabler.
- A1.68 Google Wallet launched in the US in 2011 but has yet to be introduced to the UK. It offers users the ability to store debit, credit, loyalty and gift cards, as well as redeeming sales promotions on their mobile phone. The service was initially compatible with MasterCard PayPass merchant terminals and Visa swiftly licensed its payWave system to Google for use post-launch.
- A1.69 In an interesting innovative development, in May 2013 Google announced the integration of Google Wallet and Gmail, allowing users to send e-money through Gmail attachments.
- A1.70 In keeping with its broader ad-funded business model, Google does not currently charge users or merchants for access to Wallet, but plans to generate revenue by offering sponsored ads to their users through its companion Google Shopper app.
- A1.71 In the UK, Google Play (for Android devices) allows for the virtualisation of cards for the purchase of digital content; however this operates at an arm's length, intermediary basis only.
- A1.72 Google is a major investor in Host Card Emulation (HCE) in partnership with Visa and MasterCard. HCE is available on the KitKat (Android 4.4) operating system which was first released in November 2013, and is designed to offer a secure, low-friction alternative to the storage of consumers' financial data on mobile secure elements. This investment is likely to reflect Google's desire to be an 'over-the-top' provider and enabler of payments services, without depending on MNOs (who control access to the secure elements on SIM cards).
- A1.73 Delays in launching NFC capability within mobile wallets outside the US might be in anticipation of HCE proving a viable, secure alternative. In the US, Google has had difficulties in getting its Wallet application supported by some MNOs, with some commentators suggesting that the Wallet has effectively been 'blocked' by MNOs wishing to promote their own NFC payments (Verizon, AT&T and T-Mobile USA are shareholders in the mobile payments joint venture).
- A1.74 Facilitating payments is clearly central to eBay's business model, and its purchase of PayPal in 2002 has been an integral part of its strategy of facilitating secure and frictionless online payments. PayPal is the only online payment service fully integrated with the eBay platform, but is also available on many other online retailers (as well as in some physical retail stores) as an alternative to card payments (see Annex 2 for more details on PayPal).
- A1.75 Amazon has focused on making payments as frictionless as possible for its users, with Amazon 1-Click enabling logged-in users to make payments from pre-registered cards with just 'one click'. Through Amazon Payments it is looking to leverage its user base by offering the same checkout experience to other web sites: consumers can make payments using the card details held in their Amazon accounts. However, despite launching in the US in 2007, as with Google Wallet, this product has yet to arrive in the UK.

- A1.76 Facebook has formerly played in the payments space; Facebook Credits were a virtual currency that enabled people to purchase items in games and non-gaming applications on the Facebook platform. Facebook Credits were discontinued in 2012 in favour of local currencies.
- A1.77 There has been speculation that Facebook is developing a mobile payments system. It has been reported to have applied for an e-money licence in Ireland which would enable it to offer an e-money service across Europe, where for example Facebook could issue digital credits which could be converted into cash by recipients⁴⁰. There have also been reports that it is developing payments capabilities within its Facebook Messenger mobile app⁴¹. This would potentially offer the ability to send money via messages using credit or debit cards linked to Facebook accounts. Facebook has not commented on these media reports.

Business-to-business enablers of mobile payments

- A1.78 Intermediaries and enablers from the communications and technology sector play a key role in ensuring interoperability, addressing fragmentation and creating economies of scale. Examples of industry players who may have key roles in facilitating the payments ecosystem include network and connectivity providers such as BT, chipset providers such as ARM, security experts such as Gemalto, Trusted Service Managers such as Gemalto and Oberthur and software providers such as Monitise and CorFire. Industry bodies with critical functions include the GSMA (a global association of mobile operators and related firms who define global mobile standards) the NFC Forum (an association including members from all parts of the NFC ecosystem) and Global Platform (a consortium of TSMs and card networks who define protocols).
- A1.79 We met with BT Payments Solutions, a new business within BT Global Services, who consider that BT can play a key role in enabling connectivity and interoperability, addressing fragmentation and creating economies of scale. BT has multiple assets which it can potentially leverage to supply all parts of the payments value chain including network provision, contact centres, payments platforms and engineer expertise.
- A1.80 Gemalto is a technology firm focusing on digital data security who plays a key enabling role in the emerging mobile payments ecosystem. It is a supplier to MNOs, banks and card networks; for example it is the manufacturer of over 50% of SIM cards globally (30-40% in the UK) as well as one of the largest providers of bank cards. It plays a key role in standardisation as part of the Global Platform consortium, and in its role as a Trusted Service Manager provides a communication role between MNOs and payments processors. It highlighted fragmentation as a potential constraint to the take-up of mobile payments, emphasising the importance of cross-industry collaboration to agree standards and ensure interoperability.

⁴⁰ <http://www.ft.com/cms/s/0/0e0ef050-c16a-11e3-97b2-00144feabdc0.html#axzz3HL6PN7HU>

⁴¹ <http://www.theguardian.com/technology/2014/oct/06/facebook-mobile-payments-messenger-app>

Annex 2

Innovation from the financial services sector

Introduction

A2.1 For the purpose of this study, a number of communications and financial services stakeholders were engaged to explore the types of innovation being developed, the business and revenue models being used, and the critical success factors for each.

A2.2 We met four groups of financial services firms:

- 1) Card networks – Visa, MasterCard, American Express;
- 2) Interbank payment systems – Faster Payment Service, LINK;
- 3) Recent collaborative financial sector-led innovators – Paym, Zapp; and
- 4) Prominent disruptive innovators – PayPal.

A2.3 Below we detail our findings from stakeholder meetings with each group

Card networks

A2.4 Card networks are helping innovation in the payments industry in several areas, including:

- 1) Clearing and processing;
- 2) Wallets;
- 3) Person to person payments;
- 4) Mobile POS devices; and
- 5) Investment and research and development in payments innovation.

A2.5 The outline, business and revenue models and critical success factors of each are examined below.

Clearing and processing

Outline

A2.6 The four-party card networks (e.g. Visa and MasterCard) provide the processing for some transactions using cards, and card-based innovations on their network. During any four-party transaction, the merchant's acquirer communicates with the customer's card-issuing bank across one of the networks in order to authenticate the transaction. Four-party card networks also arrange the settlement of funds between the customer's bank and merchant's acquirer, which takes place across accounts held at the Bank of England or at a clearing bank.

A2.7 American Express (a three-party card network) issues cards, acquires merchants and acts as settlement counterparty for all transactions on its network. In other words, the company has direct relationships with end users and conducts all elements of a card network, including product development, customer service, customer risk management, network systems, authorisation, clearing, settlement, brand advertising and marketing. Where it licenses financial institutions to issue cards on its network, American Express is the settlement counterparty with that financial institution.

Business and revenue models

A2.8 Visa and MasterCard do not issue any of the cards that display their brands nor do they sign up any merchants to accept those cards. They therefore require licensing agreements with issuing and acquiring institutions which issue/acquire credit, debit, commercial and prepaid cards.

A2.9 Merchants pay a Merchant Service Charge (MSC) every time they receive a card payment. This fee is paid to their 'acquirer' – a financial institution, which processes electronic payments on behalf of the merchant. A portion of this fee is then passed on as an 'interchange fee' to the bank that issued the customer's card.

A2.10 Visa and MasterCard gain revenue from "network" and "assessment" fees charged to issuers and acquirers respectively. These fees are charged for use of the Visa or MasterCard brand and/or network for the processing of transactions.

A2.11 American Express (and other 'three-party' card networks) issue their own cards and acquire their own merchants. American Express therefore collects the MSC, called a "discount rate" directly from merchants. In addition to discount rate revenues, American Express gains revenue through issuing credit and charge cards (from annual fees, interest payments and other charges).

Critical success factors

A2.12 It is critical to the success of any payments innovation that consumers, merchants, and issuers consider it secure. Card networks have invested in new security technologies such as biometrics and tokenisation in the hope that these will reduce fraud and improve security.

A2.13 Many innovations supported by the card networks rely on a ubiquitous merchant acceptance network. The success of contactless innovations will, for example, depend on the prevalence of NFC-enabled merchant POS devices.

A2.14 The future success of card-based mobile payments was also seen as important for card networks, as developments in this area could drive increased transaction volumes. Card networks are working with parties like Apple and Everything Everywhere to develop mobile payment innovations.

A2.15 Innovations running over interbank payment systems may compete with the card networks for transactions. (e.g. Zapp will use Faster Payments when launched). The card networks will compete with such future players by, for example, providing an international acceptance network (while Faster Payments is solely domestic) or by providing charge-back guarantees.

A2.16 Card issuers have traditionally been incentivised to develop card-based innovations by the increased interchange revenue they stand to gain if the innovation increases

consumer card use. European legislation is expected to cap these fees below their current levels. This may therefore change the incentives driving card-based innovation.

Wallets

Outline

- A2.17 Visa and MasterCard have developed digital wallets for online transactions (V.me and MasterPass). These allow customers to store the details of multiple credit, debit, reward, and charge cards online. Customers are able to pay for goods online using only a username and password to initiate the transaction. Digital wallet transactions share no card details with the merchant. This reduction in authentication friction and fraud risk ought to reduce rates of transaction abandonment.
- A2.18 These digital wallets are capable of holding cards from multiple card networks, not only their own and intend to allow consumers full choice of which cards to use.

Business and revenue models

- A2.19 Card networks require partnerships with merchant acquirers in order to help pursue their ambitions in the digital wallet space, as these institutions are responsible for the roll-out of new payment methods to both online and physical merchants.
- A2.20 Through wallets, card networks hope to generate revenue by increasing the number of transactions across their networks both by improving the security and convenience of online card payments and by encouraging consumers to make their cards 'top of wallet'. This will be done, for example, through branding and offers.
- A2.21 Digital wallets may also increase card networks' ability to analyse and monetise trends in transaction data.

Critical success factors

- A2.22 Card networks already have strong relationships with merchant acquirers, which may give their e-wallets an advantage over other firms offering e-wallet services, such as mobile network operators or internet firms such as Google. MasterPass is, for example, an extension of MasterCard's current POS merchant acceptance relationship.

Person to person payments

Outline

- A2.23 Visa has created an online person to person payment facility called 'Visa personal payments', which allows consumers to send money to one another via their mobile-banking apps, using their visa card or phone numbers.
- A2.24 Visa Personal Payments competes with Paym for person to person payments. Paym processes domestic transfers across Faster Payments and LINK.

Business and revenue models

- A2.25 Visa Personal Payments requires partnerships with issuing banks. The leading partner in its development was RBS.
- A2.26 As with all payments using the Visa network, issuers will pay Visa a network fee on each transaction.

Critical success factors

- A2.27 Visa hopes to out-compete Paym by offering customers the charge-back assurances that a Visa transaction offers.
- A2.28 Visa also hopes Visa Personal Payments' ability to operate internationally will give it a competitive advantage over Paym, which only offers domestic payments.

Mobile POS devices

Outline

- A2.29 Card networks are investing in mobile POS device manufacturers. Mobile POS devices allow small businesses to accept card payments without the costly and complex investment typically necessary when installing traditional POS hardware. Examples include MasterCard's investment in iZettle, and Visa's investment in Square.

Business and revenue models

- A2.30 mPOS solutions have a simple pricing model. iZettle UK, for example, charges a standard 2.75% transaction fee, which can drop to 1.5%, depending on the volume of transactions⁴².

Investment and research and development in payments innovation

Outline

- A2.31 Card networks have invested in start-up payments innovators such as Monitise and iZettle. MasterCard has also partnered with Start-up Bootcamp and Innovate Finance to facilitate and invest in the payments innovations developed by smaller firms.
- A2.32 Card networks invest in the development of new payments technologies such as those based on tokenisation and biometrics. Tokenisation allows electronic payments to occur without the need to share card details with merchants. Biometrics (e.g. fingerprint scanners) can offer increased security for payment innovations.

⁴² <https://www.izettle.com/GB/pricing>

Interbank payment systems – Faster Payments

Clearing and processing

Outline

- A2.33 The Faster Payments Service (FPS) is an interbank payment system that typically gives recipients access to their money within a few seconds of payment initiation. It provides near real-time clearing and processing for account to account transfers. Individual transactions processed by FPS are aggregated and netted and the resulting interbank obligations are settled across members' settlement accounts at the Bank of England.
- A2.34 FPS also currently clears the vast majority of Paym transactions (with the remainder clearing across the LINK network). Zapp also intends to clear all its transactions through FPS, though it is operated by an independent company with no corporate connection to the company that operates FPS. Any other new players in the industry should have access to transaction-type codes on the same basis as Zapp.
- A2.35 FPS supports consumer-facing propositions such as Zapp, Paym, and Pingit by providing an alternative clearing route to the card networks, which currently clear the majority of mobile payments.
- A2.36 Zapp, Paym and similar propositions can be allocated a code that accompanies each FPS transaction they initiate. These codes are held on FPS's 'data dictionary' and allow recipients to identify the transaction-type (e.g. as a Paym transaction). There are at least 999 possible codes, which could be assigned to different payment initiators to allow for value-added innovations associated with the underlying faster payment.

Business and revenue models

- A2.37 Faster Payments Scheme Limited (FPSL) is a not-for-profit company, owned by its member banks. The infrastructure behind Faster Payments is provided and operated by VocaLink under commercial contract to FPSL. The FPS infrastructure currently offers four access options:
- Direct Corporate Access: this is done through corporate bank accounts with member banks. It ensures that payments are received by the end of that day.
 - Indirect Agency Access: an indirect member sends FPS payments to a direct member to be settled across FPS; payment timings vary.
 - Direct Agency Model: the agency has its own technical connection to FPS that is similar to that of a direct member. This results in a fully real-time payments experience for customers. The agency does not have a settlement account at the Bank of England, but settles through a sponsorship arrangement with a direct member.
 - Direct access: fully near real-time payments experience for customers. Settlement occurs through the Real-time Gross Settlement system using the member's own settlement account at the Bank of England.
- A2.38 Paym also allows members without a direct connection to FPS to send payments across the LINK network, which has a broader direct membership. Zapp will aim to

be available to participants with indirect connections to Faster Payments, as well as the direct members.

- A2.39 When organisations want to develop a new service that uses FPS, they tell FPSL what they require of the system. FPSL then suggests a proposal detailing how the changes it considers necessary might be accomplished.
- A2.40 Following the development of any new service, each organisation must have its systems rigorously regression tested to ensure that its altered set-up is entirely secure before the new service is launched.

Critical success factors

- A2.41 Some innovations require changes to the set-up of Faster Payments. These rely on the ability and willingness of the member banks to make the necessary changes to their IT infrastructures – many of which have legacy issues and a substantial agenda of technology changes driven by regulation. As well as being complex and costly, substantial changes, like account redirection for the Current Account Switching Service (CASS) service (but not allocation of new payment sub-types), tend to require particular expertise.
- A2.42 FPS is a systemically important payment system in the UK that is used directly by customers on a 24 x 7 basis. Technical failures in FPS could have serious negative consequences. This requires rigorous pre-release testing when changes are made. This, along with the potential for innovations to move at the pace of the slowest member can make altering FPS cumbersome. When technically and operationally possible, FPS can allow some members to release certain initiatives without all participants accompanying them. The initial release of the Faster Payments service, for example, was only for a subset of the direct members. This can quicken the progress of the remaining participants due to the competitive advantage gained by the early movers.
- A2.43 Long-term, plans to improve access to Faster Payments for small and challenger banks should enhance its ability to support large-scale payments innovations.

Recent collaborative financial sector-led innovations

- A2.44 The financial and payments infrastructure sectors have recently developed two major mobile payments innovations:
- 1) Paym; and
 - 2) Zapp.
- A2.45 The outline, business and revenue models and critical success factors of both are examined below.

Paym

Outline

- A2.46 Paym is a P2P payment service that allows its users to send money to one another's bank accounts in seconds, using only their mobile phone numbers. It is targeted at families, students and small traders, and hopes, for example, to offer a convenient way of splitting restaurant bills.

- A2.47 To initiate a Paym transaction, users log into their mobile banking app and enter the amount they wish to send, along with the recipient's mobile number (or select it from their contacts list). Typically, a few seconds later, the user will receive a confirmation request detailing the recipient's name as it appears on the bank account. By requiring confirmation of the recipient's name, Paym provides the sender with added assurance the payment is being directed to the correct person, thus hopefully significantly reducing the risk of misdirected payment.
- A2.48 The recipient's mobile banking app will notify them that they have received money via Paym. The speed and content of this message depends on the bank.
- A2.49 Paym does not share bank account details between the payer and payee. Rather, phone numbers are matched to account details in a secure database. This database looks up the mobile number provided and, if it is registered on the database, the associated payment routing data is provided back to the sending bank for a payment to be then initiated via the normal FPS or LINK systems. Users can register multiple phone numbers (proxies) with their bank account on the Paym database. There can, however, only be one account mapped to these proxies at any given time.
- A2.50 The majority of banks have set a £250 limit on transaction values, though some banks allow customers to vary their personal limit. This limit is likely to increase over time (as did the limit on Pingit transactions, which began with a limit of £250 that has since increased to £1500 for personal payments and £3000 for business payments).
- A2.51 Within the first 150 days of the service going live, more than 1.4 million customers had registered with Paym. It hopes to provide users with the benefit of a very wide network: when fully rolled out, it will be potentially available to circa 95% of UK current account holders.
- A2.52 At launch Paym focused on P2P payments; however some banks have broadened the Paym offering to their small business customers too and other banks may follow.
- A2.53 Consumers interact with Paym through a mobile banking application provided by their bank or Payment Service Provider (PSP), not by Paym itself. There are no intermediaries, add-on accounts, text instructions, other third parties, or public communications involved in the process.

Business and revenue model

- A2.54 Paym provides its members with no direct revenue. The primary benefits to members are customer acquisition and retention, as well as ownership of the transaction data, which Paym does not own.
- A2.55 Paym was a collaborative project run through the Payments Council, which involves all of the major UK clearing banks. Proxy and payment dispute resolution as well as fraud monitoring are provided by the Mobile Payments Service Company (MPSCo Ltd), which is owned and run by the members of the service. Paym is set up in such a way as to allow new entrants to join – to date, nine banks and building societies offer Paym, six more are joining later in 2014, and four plan to join in 2015.
- A2.56 The vast majority of Paym transactions are cleared using Faster Payments. Clearing can also occur across the LINK network. This route was established in

order to increase access (as LINK has a wider membership than Faster Payments, and lower setup costs).

- A2.57 Paym and the database connecting phone numbers with bank accounts are managed on a cost-recovery basis in which both payer and payee banks pay a per-transaction fee. In addition to this, the usual fees associated with making a Faster Payments or LINK transaction must be paid to the relevant payment system.
- A2.58 Provision of infrastructure for Paym was put out to tender and awarded to VocaLink for 5 years (after which it can potentially be awarded to another infrastructure provider).

Critical success factors

- A2.59 Levels of consumer interest / take-up will determine Paym's success, as it becomes more appealing as users have access to a larger network of contacts. Paym currently forecasts 1bn annual transactions by 2018.
- A2.60 Paym is primarily concerned with growing its network with a customer proposition that is as simple and easy as possible (currently solely in the P2P and sole trader / small business space).
- A2.61 In the future, Paym could potentially expand into the wider Person to Business (P2B) space, putting it in competition with mobile wallet solutions and Zapp. Although using a mobile phone number as a proxy for bank account details is the launch proposition, it has been designed to facilitate the potential addition of new functions and could theoretically connect bank accounts with QR codes, email addresses and more.
- A2.62 The key factor which will determine whether or not Paym moves beyond its current P2P offering will be the appetite of its member banks for further investment and collaboration.

Zapp

Outline

- A2.63 Zapp will allow consumers to use a smartphone to pay for goods and services online and in-store. Funds will be withdrawn from bank accounts in real-time using Faster Payments. Zapp will launch an e-commerce, m-commerce and physical point of sale solution. It hopes to offer consumers and merchants a very low-friction payment method.
- A2.64 Zapp will give consumers the ability to check their balance prior to authorising a payment and to choose from multiple registered bank accounts – helping consumers avoid unnecessarily going into overdraft. Zapp deals entirely with 'push' payments, which, unlike direct debits gives consumers full control over transactions.
- A2.65 Zapp also hopes to offer a utility bill payment method for those who are resistant to direct debit payments. This would be preferable to consumers who wish to have greater control of their money as Zapp would provide a prompted 'push' payment rather than the forced 'pull' payment, which occurs in direct debits.
- A2.66 Zapp does not handle any customer funds or share any customer data with merchants. It authorises transactions using a randomly generated, unique, single

use, token that includes no personal, financial or transactional information, and in this way hopes to protect its customers from fraud.

- A2.67 When a consumer chooses to pay by Zapp on a website, the merchant sends a payment request to the Zapp server via their distributor / acquirer. After validating the transaction, Zapp creates a unique transaction ID, which is communicated back to the consumer's mobile app using a 'one-time token'. The consumer logs into their mobile banking app and confirms the transaction information. Zapp then confirms the transaction to the merchant, who releases the goods. The consumer's bank then initiates a Faster Payments transaction.

Business and revenue model

- A2.68 Zapp is owned and run by VocaLink and has partnerships with several leading retail banks and merchant acquirers.
- A2.69 Zapp's partners currently include banks representing 18 million UK current accounts, and acquirers covering 60% of merchants. Around 45% of firms providing payment services to merchants say they will offer Zapp to their merchants at its launch.
- A2.70 Zapp uses Faster Payments to process its transactions but has no direct partnership agreement with Faster Payments, only with banks that use it. This is in line with Faster Payments' remit to provide an open infrastructure, i.e. one which could accommodate potentially competitive 'Zapp-like' propositions.
- A2.71 Zapp offers banks a new revenue stream through a share of transaction fees paid by merchants. Given Zapp represents an alternative to traditional payment cards, banks using Zapp may be cannibalising the revenues they currently get from interchange on card transactions. However, with interchange revenues under threat (in part, due to EU regulation), banks may be introducing a replacement revenue stream; or acting on the belief that if they do not develop it, other players will.
- A2.72 Zapp hopes to attract online merchants by reducing payment friction through a faster checkout process which reduces transaction abandonment (it claims to offer a 20-50% reduction in check-out steps relative to card transactions and suggests that around 10% of potential customers abandon the transaction for every added step in a check-out). Zapp transactions take only around 12 seconds – compared to card transactions, which typically take 40-90 seconds and Amazon or PayPal transactions, which typically take around 14 seconds. Zapp also, unlike the card networks, provides merchants with real-time settlement.
- A2.73 Zapp hopes that its digital tokens model (which limits the consumer data being shared with merchants) will reduce fraud risks, thus allowing it to offer competitive rates. How competitively Zapp can price will depend on the interchange regulations coming out of Europe, as lower card-interchange will present stiffer competition.
- A2.74 Zapp will include POS solutions and has already commenced the development cycle. It is agnostic as to what forms of authentication might be used at POS. Options include NFC, Bluetooth, QR codes, etc. Zapp has stated that it is not interested in using the secure element in mobile SIM cards. Zapp is currently in discussion with POS device manufacturers as to what over-the-air firmware updates would be necessary to enable Zapp acceptance.

Critical success factors

- A2.75 Zapp must build scale to be attractive for consumers, merchants, or banks. Given the large number of m-commerce solutions currently available, many merchants are holding-off on investment until they feel that a widely accepted solution has emerged.
- A2.76 Uncertainty around interchange regulations may be holding back merchant investment in Zapp (as it is not yet clear how the price of Zapp will compare to the traditional card networks, post-interchange regulation).
- A2.77 Zapp is partnering with banks that have access to FPS and is exploring how to partner with banks that do not have FPS access.
- A2.78 There is a risk that MNOs, Apple, or other device manufacturers might have an advantage over Zapp if access to a secure element or other smartphone hardware (e.g. Fingerprint scanner) proves to provide a significant competitive advantage.
- A2.79 Zapp needs the industry to move quickly. Its chances would be improved by clarity around interchange regulation that is currently clouding the future pricing of its main competitors (the card networks).

Prominent disruptive innovators - PayPal

- A2.80 PayPal is an online e-money issuer that allows consumers to pay both businesses and other consumers through an online e-money account without sharing any financial information. PayPal sits on top of the existing payment infrastructures (credit card network, BACS, Faster Payments, and CHAPS. When a consumer initiates a PayPal transaction, e-money is transferred from the consumer's to the merchant's PayPal account. This e-money can be either pre-loaded or can be taken at the moment of transfer from a 'linked' card or bank account. PayPal has Direct Agency access to FPS through a sponsorship arrangement with a direct member bank. PayPal also enables merchant innovation through Braintree, which allows merchants to offer a range of payments methods in their apps, including PayPal, credit and debit cards and others.
- A2.81 PayPal currently has two main innovative payment initiatives:
- 1) The PayPal Mobile App;
 - 2) POS device for smaller merchants ('PayPal Here').

The PayPal Mobile App

Outline

- A2.82 PayPal offer a range of payment solutions to help merchants merge their online and in-store experiences. It hopes to offer merchants the opportunity to create new and better in-store experiences that allow them to interact with their customers via their smart phones.
- A2.83 Merchants who wish to create an 'omni-channel' experience can do so in a number of ways:

- merchants can create their own website, allowing customers to browse, order, enquire etc. on their phones and offer PayPal as a secure and low-friction alternative to entering card details;
- merchants can create their own smart-phone app to accept PayPal payments via its mobile SDK; and
- merchants can choose to be incorporated into the PayPal mobile app.

A2.84 The PayPal mobile app offers consumers the opportunity to see nearby retailers who accept PayPal payments in store. It uses geo-positioning to inform consumers of the distance to nearby stores along with any deals those stores are offering to PayPal app customers. Once customers have chosen a store / restaurant from this list they can pay with picture payment, and in some cases pay at their table without waiting for the bill. Alternatively, they may also browse menus and order ahead to collect at a specified time.

A2.85 When paying for food / products / services via the PayPal app, a merchant's till is sent details of the payment, including a picture of the person who has paid to avoid staff confusion. Alternatively, retailers can choose to provide customers with a barcode on their smartphones as soon as they select that merchant on the PayPal app. This bar code can then authorise any transaction within that store for a given period of time.

Business and revenue model

A2.86 PayPal conducts all of its own merchant acquiring. It draws on its online merchant base to push its omni-channel solutions to merchants who have both a physical and an online presence. It is also engaged in acquiring physical-only merchants, particularly in the hospitality industry where omni-channel solutions are especially effective.

A2.87 PayPal is partnering with a number of third-party technology providers in order to help create complex, tailored, omni-channel solutions for merchants.

Critical success factors

A2.88 Beacon-based payment solutions currently being launched in America, which allow customers to pre-authorise transactions at particular merchants through logging into the PayPal app, are far less feasible in the UK because of differences in EU and US regulation.

A2.89 PayPal claim that the requirement for very high mobile internet coverage in the UK has constrained the effective widespread roll-out of omni-channel, in-store solutions at present. PayPal has made its data requirements as low as possible in order to reduce its mobile internet speed requirements, but claim many areas still do not have adequate data coverage.

A2.90 Although most consumers can currently authenticate PayPal App payments using either their mobile number and PIN or their PayPal usernames and passwords, PayPal is looking to further reduce friction in the future. It has, for example, a partnership with Samsung to allow customers to log into PayPal using the fingerprint scanner on the Galaxy S5, and expects biometric authentication methods to offer further reductions in friction and security risks in the future.

A2.91 PayPal does not believe that any 'one size fits all' payment solution will be successful. It argues that merchants will only be interested in physical payments solutions that add real value to the store-experience they offer customers. Given that the experiences merchants will want to create vary significantly, successful payments innovations will need to allow merchants to tailor their customer experiences heavily.

POS device for smaller merchants

Outline

- A2.92 PayPal has launched a mobile POS device aimed at small merchants who find the cost and complexity of traditional card-acceptance terminals to be prohibitive. The device, which can fit into a trouser pocket, currently retails at between £49 and £99. It is not permanently linked to any one merchant and can therefore be lent between merchants who operate at different times (e.g. street stalls). The proposition is similar to m-POS solutions such as those being developed by iZettle and Square.
- A2.93 PayPal's POS device is designed to maximise simplicity, with a single, per transaction charge (2.75% for Chip and PIN authenticated payments), and no complex joining process. Merchants only require a merchant PayPal account.
- A2.94 As well as accepting credit and debit cards, the device, which is fully EMV 1 and 2 compliant, is capable of connecting via low-energy Bluetooth to a merchant's smartphone, where the transaction can be completed using the customer's PayPal app.
- A2.95 Records are kept of all purchases made via the POS device, allowing merchants to use PayPal as a book-keeper for their accounts. In order to facilitate this option, there is also the opportunity for merchants to have PayPal record all of their cash and cheques.

Business and revenue models

- A2.96 PayPal's mPOS solution is competing with other mPOS terminal providers, such as iZettle and WorldPay Zinc, which are also targeting smaller merchants.
- A2.97 PayPal does not look to profit directly from sale of its POS devices, instead seeking to make money through the 2.75% fee it charges merchants for each transaction.

Critical success factors

- A2.98 PayPal believes the success of its POS card-reader device will be driven by the current cost and complexity of accepting cards through traditional routes. This has, PayPal argues, left a gap: small merchants who are keen to accept cards and avoid the high abandonment rates associated with cash.

Annex 3

List of stakeholder meetings

American Express

Bank of England

Bango

Boku

British Retail Consortium

BT

EE

Faster Payments Services

Gemalto

LINK

MasterCard

Mobile Broadband Group

O2 UK

PayM

PayPal

Samsung

Three UK

Visa

Vodafone (UK and Group)

Weve

Zapp

Annex 4

Glossary

Authentication A security mechanism for verifying the identity of a person or entity in relation to a potential transfer of funds.

Bluetooth Low Energy (BLE) Bluetooth specification allowing the creation of body area and ad-hoc networks, operating over short ranges. Capable of 1 Mb per second data rates.

Operator billing A method of using a mobile phone bill to pay for (usually digital) goods and services; for post-pay contract customers the price is added to the monthly bill, and for pre-pay customers the price is debited from the pre-paid air-time balance.

Cloud Scalable remote resources which allow on-demand provisioning of computer processing.

Contactless A method of making a payment by holding a card or mobile phone above a reader device, rather than by inserting the card physically into a reader; this may use technology such as field communication (NFC) and has the advantage of greater convenience for users and a faster transaction time.

Data monetisation An approach where datasets are analysed to produce information which can be commercialised. For example, analysing transaction data to better target advertising.

Digital goods exemption An exemption under the Payment Services Regulations 2009 which states that the following are not payment services “payment transactions executed by means of any telecommunication, digital or IT device, where the goods or services purchased are delivered to and are to be used through a telecommunication, digital or IT device, provided that the telecommunication, digital or IT operator does not act only as an intermediary between the payment service user and the supplier of the goods and services.”

E-money Defined in the Electronic Money Regulations 2011 as electronically (including magnetically) stored monetary value as represented by a claim on the electronic money issuer which is issued on receipt of funds for the purpose of making payment transactions and is accepted by a person other than the electronic money issuer.

EMV Europay, MasterCard and Visa industry standard for credit/debit card integrated circuit (typically a gold coloured chip visible on credit cards).

Friction Additional time incurred by the process elements of making a payment; as technology, for example, enables various elements to be removed, the overall process becomes ‘frictionless’.

Host card emulation (HCE) Software based emulation of the Secure Element, typically deployed within a cloud computing infrastructure..

Interbank transfer A transfer made between two banks.

Interchange fee The term used in the payment card industry to describe a fee usually paid between institutions for the acceptance of card-based transactions. For example, for credit or debit card transactions, the interchange is a fee paid to the cardholder’s financial institution (the issuer) by the merchant’s financial institution (the acquirer) for each transaction made.

Know Your Customer (KYC) A due diligence approach used by financial institutions to limit fraud.

Merchant service charge A fee that merchants pay to their acquirer, in return for a range of services, including payment guarantee, connectivity to the card system network, terminal hardware and software, customer support.

mPOS A point-of-sale device that operates using mobile telephone networks for data transmission. Typically these involve a device attached to a mobile phone, allowing the acceptance of card payments.

Near Field Communication (NFC) NFC is a collection of standards describing a method of wireless communication operating at 13.56MHz. NFC typically operates within centimetre distances.

Network fee A fee paid to the card networks for each transaction.

P2B 'Person-to-business', in this case referring to payments made between a private individual and a business (for example a retailer).

P2P 'Person-to-person', in this case referring to payments made between two private individuals.

PSD The European Payment Services Directive, enacted into UK law by the Payment Services Regulations 2009.

QR Code Quick Response Code; a matrix, square or bar code that contains data and that requires software to read and process the QR Code.

QR-Reader Quick Response Reader, software that processes QR Codes, typically via a Smartphone or tablet camera.

Quasi-physical goods Goods which can be replaced by digital alternatives, for example, parking tickets and train tickets.

SIM cards Subscriber identity module used to authenticate devices on mobile networks; later variants can support the deployment of cryptographic keys used to verify and manage mobile-based payments systems.

Single Wire Protocol (SWP) Physical interface and the data link layer used between the Secure Element and NFC front-end.

Secure Element Tamper resistant microprocessor forming part of the Subscriber Identity Module (SIM) card found in mobile phones.

Tokenisation In mobile payments, a process to improve transaction security where the original information, eg credit card details, are replaced by an unrelated reference number, called a token.

Universal Integrated Circuit Card (UICC) Also known as a SIM card found in modern mobile and many tablet devices.