

The Impact of Innovation in the UK Retail Banking Market.

A Final Report for the Competition and
Markets Authority.

30 July 2015

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1 Competition and innovation in banking

In November 2014 the Competition and Markets Authority (CMA) made a reference for a market investigation into the supply of retail banking services to personal current account (PCA) customers and to small and medium-sized enterprises (SMEs) in the UK. PCAs and retail banking in general have been a key focus for the CMA, and the Office for Fair Trading (OFT) before it, with several market studies conducted in the past.¹ In its subsequent Statement of Issues (Sol) and Updated Issues Statement (UIS) publications, the CMA set out its hypotheses on the features of the market that may give rise to an adverse effect on competition. These hypotheses, referred to as theories of harm, provide the framework for the CMA's investigation.

The theories of harm identified by the CMA are as follows:²

- **Theory of harm 1:** Impediments to customers' ability to effectively shop around, choose and switch products or suppliers, resulting in weak incentives for banks to compete for customers on the basis of price, quality and/or innovation;
- **Theory of harm 2:** Concentration giving rise to market power of some banks, leading to worse outcomes for customers;
- **Theory of harm 3:** Barriers to entry and expansion, leading to worse outcomes for customers.

While the theories of harm are presented as three separate hypotheses, the CMA has recognised that in practice there may be significant inter-relation between them. For example, if Theory of harm 1 is correct, then there are likely to be implications for the other theories of harm too (low customer switching would constrain the ability of existing players to acquire new customers and make it more difficult for new entrants to establish and gain market share).

A full assessment of these theories of harm requires an appreciation of the way innovation is impacting the dynamics of the market. Recognising this, the CMA has identified innovation (along with regulation and the macroeconomic background) as a key characteristic that requires particular attention in the investigation.³ Similarly, many UK banks have emphasised the need to consider the role of innovation in changing the way customers engage with banks and impacting both the dimensions and intensity of competition in the market.

A key theme that has been raised by several banks is the growth of digital banking. The British Banking Association (BBA) estimates that customers now log in to their banking apps 10.5 million times a day and use them to transfer £2.9 billion each week, with 9.6 million daily log-ins to Internet banking services in March 2015. The presence of these channels means customers have better access to their accounts than ever before and may impact the role of branches, the importance of which is traditionally seen as posing barriers for potential entrants. Similarly, some banks have identified the potential for disruptive entry. As technology develops across other markets, some banks have highlighted the potential threats posed by non-traditional market players, such as Apple, Google and PayPal, in the payments and banking space.⁴

Understanding the extent to which these themes are reshaping the way the market operates will be a key element of the assessment of the competitive issues in the market.

¹ See OFT, 2008

² These theories of harm were first set out in the Sol and were unchanged in the subsequent UIS.

³ Competition and Markets Authority, 2015

⁴ For example, HSBC, Lloyds Banking Group.

2 Methodology

2.1 Scope of this study

This study forms part of the CMA's broader investigation into competition in the retail banking market. The objective of this study is to understand key innovations in the banking sector, the drivers and barriers to innovation and the potential implications for competition. However, innovation is a broad term, which can mean different things to different people, and it encompasses several themes, including technological change, changes in services offered and changes to banks' business model.

In order to provide structure to the analysis and to facilitate more detailed analysis of both levels of development and the mechanisms that link innovation and competition, the study focuses on a selection of five defined "innovations" in the banking market. These innovations were agreed by the CMA and Deloitte, with the aim of achieving broad coverage of both the potential impacts across the CMA's theories of harm and the degree of current development in the UK.

The five innovations that were agreed are listed in Table 1.

Table 1: Innovations considered in the study

Innovation	Explanation
Mobile banking	The provision of banking services through mobile/smartphone/tablet channels.
Digital wallet	A service that facilitates the storage of (potentially multiple) payment credentials and payment either online (e.g. PayPal) or via a mobile device (e.g. Apple Pay).
Aggregators	Services that enable customers to select and buy products from a range of providers in a single place. These include price comparison websites (PCW) and more complex aggregators that use screen scraping technology to enable customers not only to select products from different providers, but to then manage those products using the aggregator site rather than logging into each individual product provider's site.
Big data	The use of data analytics both to improve the efficiency of current propositions and to develop new value added services. The focus is on the use of big data in assessing credit-worthiness, with a particular focus on SME lending.
Bank in a Box (BiaB)	The provision of comprehensive core banking systems by another party to a bank.

Source: Deloitte analysis

These innovations were chosen to capture the range of ways in which innovation might affect the market. For example, the choice of technologies reflects changes on both the demand and the supply side: mobile banking, digital wallet and aggregators are services primarily targeted at customers, whereas the discussion of big data analytics and Bank in a Box technology will be focussed on the supply side.

The set of innovations has also been chosen to reflect the different ways in which innovation may affect competition. This selection is based around the CMA's framework for considering theories of harm, which incorporates barriers to entry, the ease with which consumers can switch banking provider and the overall level of concentration in the market. Among the innovations considered, Bank in a Box was expected to have the most direct impact on barriers to entry, whereas services such as aggregators were thought to facilitate switching. The

role of third parties – either through services such as digital wallets or due to their access to data – were anticipated to have an impact on both concentration in the market and barriers to entry.

While the selection of innovations is intended to capture a broad range of issues, it should be noted that the evidence and findings presented in this report are based on these innovations alone and it is beyond the scope of this study to consider the role of innovation in a broader sense.

2.2 Approach to the analysis

For each of the innovations identified above, the study aims to identify:

- The level of development and adoption in the UK relative to selected other markets;
- The drivers of (and barriers to) adoption; and
- The ways in which the innovation may impact the market for PCAs and SME banking.

The analysis of the individual innovations is laid out in Sections 3-7 of this report. These sections explain the level of development of the innovation and the broad market impacts, which have relevance to both PCA and SME banking markets. In addition there are a number of SME-specific issues, arising mainly from the broader scope of the market investigation and the different needs of the customers. These issues are discussed separately in Section 8. Finally, Section 9 summarises the impacts and discusses the overall themes that emerge from this analysis. As many of the innovations share common themes, the implications for competition are presented for the group of innovations as a whole, rather than on an innovation by innovation basis.

Analysis of the innovations presents a number of challenges. First, by their nature the emergence and growth trajectory of disruptive technologies is difficult to predict. Moreover, many of these innovations are continuing to develop and the market remains in a state of flux. This makes it challenging to derive any robust predictions about their ultimate impact on the market, which will depend on a variety of factors, including the evolution of the technology and the regulatory environment.

The rapid evolution of these services also means that in many areas there is insufficient up-to-date data to quantify the role of these innovations. In particular, there is limited up-to-date data on the take-up of emerging services and on SMEs use of technology.

Given these challenges, the approach to gathering evidence is based on a combination of desk research and interviews with local market participants. Many of these participants are Deloitte professionals specialising in the technologies considered, but interviews were also conducted with academic experts and external parties such as banking and SME associations. In total, over 20 interviews were conducted in a number of international markets, including the UK, the US, Canada, the Nordic markets, Turkey, Poland, Switzerland and the Netherlands. These interviews have been used to gain additional market insights and to corroborate findings from other sources. Wherever possible more than one interview has been conducted in order to guard against adopting one particular participants view and the transcripts of interviews with market participants have been reviewed by Deloitte subject matter experts.

The analysis presented in this report considers the broad international landscape of each innovation, supported by a number of more detailed case studies of specific market developments. The case studies were chosen in conjunction with the CMA to reflect adoption of the technology (for example Bank in a Box in the Nordic region), interesting developments in the application of the innovation (for example digital wallet in Finland), or the success of the innovation (for example mobile banking in Turkey).

3 Mobile banking

3.1 What it is

3.1.1 Defining mobile banking

Mobile banking was first offered via SMS in the late 1990s, through basic services such as text alerts, periodic account balance reporting and money transfer services. As 3G coverage expanded and smartphone (and tablet) penetration developed, the potential of mobile banking broadened significantly: customers became able to access online banking services through their mobile phone and banks began to offer smartphone and tablet applications. Application-based mobile banking has now become a standard in the industry and it is provided by all of the main banks in the UK.⁵

The core services provided by mobile banking applications typically include:

- account checking services;
- money transfer and payment services;
- ATM location services;
- personalised alerts; and
- loan and service requests.

Mobile banking continues to develop, and examples from international markets offer insights about the potential breadth of the functionality of mobile banking apps (Case study 1 on iGaranti in Turkey provides some examples of this). Recent developments in UK banking apps include a feature that allows customers to withdraw cash from ATMs with their smartphone and a “Touch ID” biometric fingerprint feature, which allows customers to log in using only their finger print. In February 2015, Barclays became the first bank to allow mobile banking users to send payments using their Twitter handle.⁶ Features that are available in other markets that have not yet been introduced in the UK include proximity payments (using Near Field Communication (NFC) technology) and advanced personal financial management tools.

Table 2 and Table 3 compare the functionality of the banking apps of a selection of UK banks for Personal Current Accounts (PCAs) and Business Current Accounts (BCAs) respectively. They suggest that, while providing similar basic services, there is some differentiation in the apps of the main banks. There are also some differences in the extent to which banks offer specialist BCA apps. Most banks offer separate apps for PCAs and BCAs, but some (for example, Barclays) offer a dual app, which allows users to access both their PCA and their BCA in the same place. Some banks (for example, TSB) currently do not offer a mobile banking app for their BCA customers. In addition to this, there are some differences between the functionality of mobile banking apps for PCAs and BCAs. For example, for PCAs the upper limit on transactions is between £10,000 and £25,000 depending on the bank,⁷ while for most BCAs the upper limit is £100,000. On the other hand there are more restrictions on sending money to a mobile number in BCA mobile banking relative to PCA, and some do not offer the service to BCA customers even though they do for PCA customers.

⁵ At present, the largest banks in the UK market are Barclays, HSBC, Lloyds Banking Group and the Royal Bank of Scotland (RBS) Group, which together account for about 70% of the PCA market and 80-85% of the BCA market.

⁶ British Banking Association, 2015

⁷ Faster Payments, 2015

Table 2: Functionality of banking apps of the main players in the UK (for PCAs)

	Check balance	Make payment to new recipient	Send money to a mobile number (PAYM)	Branch/ATM locator	Touch ID support
Lloyds, Halifax and Bank of Scotland	YES	YES	YES	YES	NO
NatWest/RBS	YES	NO	YES	YES	YES
Barclays	YES	NO	YES (via Pingit)	YES	NO
Nationwide	YES	NO	NO (not yet)	NO	NO
HSBC	YES	NO	YES	YES	NO
Santander	YES	NO	YES	YES	NO
Metro Bank	YES	NO	NO	YES	NO
TSB	YES	YES	YES	YES	NO

Source: Deloitte analysis based on bank information and The Memo (2015) (Note: Valid as of June 2015)

Table 3: Functionality of banking apps of the main players in the UK (for BCAs)

	Check balance	Make payment to new recipient	Send money to a mobile number (PAYM)	Branch/ATM locator	Touch ID support
Lloyds, Halifax and Bank of Scotland	YES	YES	YES	YES	NO
NatWest/RBS	YES	NO	YES – have to be a NatWest customer	YES	YES
Barclays	YES	NO	YES (via Pingit)	YES	NO
Nationwide	YES	NO	NO	YES	NO
HSBC	YES	NO	NO (not yet) – can receive money	YES	NO
Santander	YES	NO	NO – only receive payments	YES	NO
Metro Bank	YES	NO	NO	YES	NO
TSB	N/A	N/A	N/A	N/A	N/A

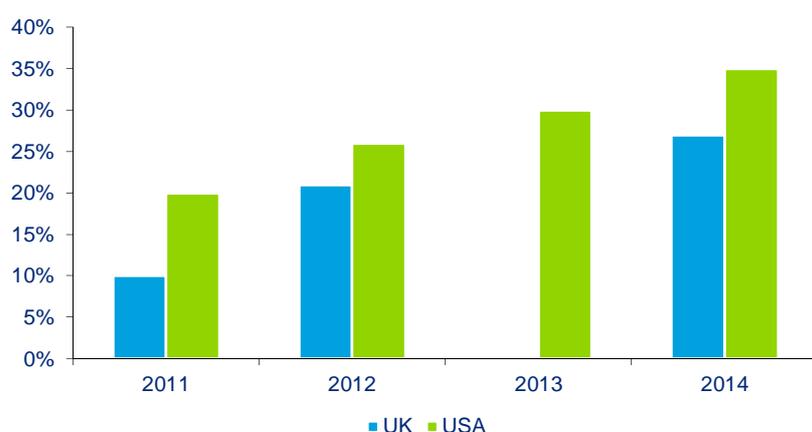
Source: Deloitte analysis based on bank information (Note: Valid as of June 2015)

Interviews with industry experts from the UK and international markets suggest a trend towards greater functionality and broader integration of banking services within the mobile app, including account opening functionality, in-store payments and advanced money management features. Over time, it would be expected that such services become more widespread in the UK.

3.1.2 International development of mobile banking

Although the use of mobile banking remains in the minority, its use has grown rapidly in the past few years. In the US, 20% of adults were using mobile banking in 2011, but by 2014 this figure had grown to 35%.⁸ Growth in the UK has been similarly rapid – one estimate puts the 2011 figure at 10% whereas by 2014 it was 27%.⁹ The BBA reports rapid growth in the use of mobile banking in the UK. They estimate that there were 8 million more downloads in the last year and that users logged in 10.5 million times a day to their mobile banking apps in the UK in 2015.¹⁰ It remains unclear where the steady state for mobile banking will be, but high levels of growth are currently continuing.

Figure 1: Proportion of bank customers using mobile banking, 2011-2014



Source: Board of Governors of the Federal Reserve System, 2015; Accenture, 2014

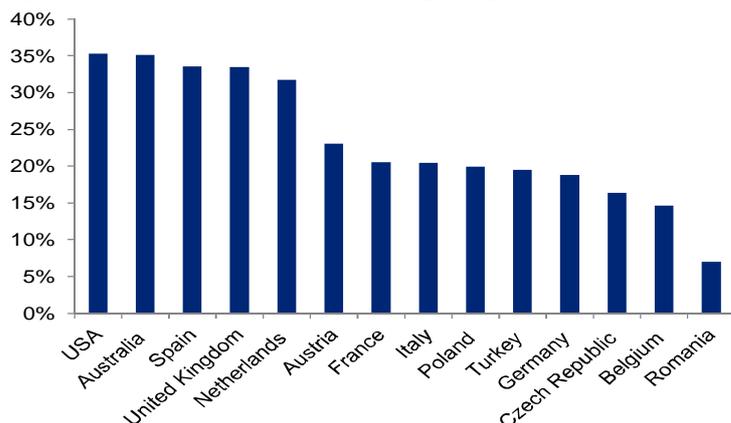
Figure 2 shows evidence from 2015 on the levels of mobile banking adoption for a selection of countries around the world. It suggests that the US is the leading market, but with around one third of customers using mobile banking apps, the UK has one of the highest levels of mobile banking adoption in the sample.

⁸ Board of Governors of the Federal Reserve System, 2015

⁹ Accenture, 2014a, 2012, 2011

¹⁰ British Banking Association, 2015

Figure 2: International mobile banking usage (2015)

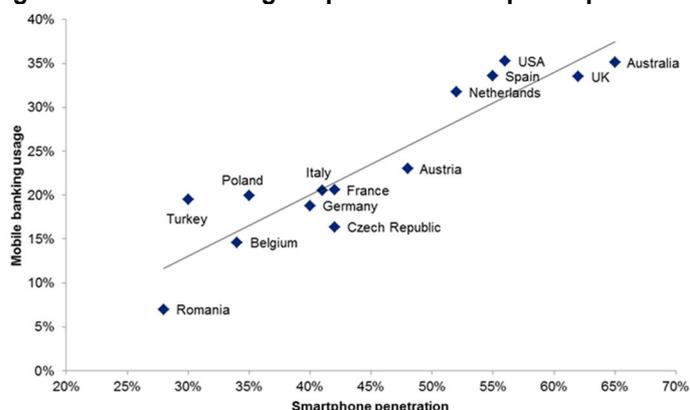


Source: Deloitte analysis based on ING (2015), Google Mobile Planet (2013)

Mobile banking usage is defined as the percentage of the population that use mobile banking on their mobile devices (e.g. smartphone / tablet)

A key factor in determining the adoption of mobile banking is the proportion of people that own a smartphone. Along with low-cost data and greater availability of mobile apps, this has been cited as the key driver of the growth of mobile banking in the UK.¹¹ As Figure 3 shows, in general, the higher the smartphone penetration, the higher the level of mobile banking usage. However, there is some variation around this relationship and it appears that smartphone penetration alone cannot explain cross-country differences in mobile banking adoption. When mobile banking adoption is taken as a proportion of smartphone users, then the UK performs slightly below average among the markets considered and the leading market is Turkey.

Figure 3: Mobile banking adoption and smartphone penetration



Source: Deloitte analysis based on ING (2015), Google Mobile Planet (2013)

Mobile banking usage is defined as the percentage of the population that use mobile banking on their mobile devices (e.g. smartphone / tablet)

Smartphone penetration is defined as the percentage of the population owning and using a smartphone.

Interviews with industry experts in Turkey suggest that a key driver of mobile banking adoption in the country is the high proportion of young people. Approximately two thirds of the population is under the age of 40 and many young people prefer to interact with their bank using their mobile phone, rather than at a branch or through a computer.

¹¹ Accenture, 2014b

Case study 1: iGaranti – mobile banking in Turkey

The retail banking market in Turkey is relatively less concentrated than in the UK. The combined market share of the five largest banks (by deposits) was 59% in 2014, while the combined share of the ten largest banks was 89%.¹² Over the past ten years there has been a slight decrease in market concentration, and interviews with industry participants suggest that banks compete fairly vigorously for new market share through product development.

Young adults represent a key market segment for banks in Turkey. Two thirds of the population are under the age of 40 and banking penetration is much lower than in most developed countries – only 43% of people aged between 15 and 25 have an account with a financial institution.¹³

Mobile banking forms an important part of banks' strategies to reach out to this key segment. Findings from recent Deloitte research suggest that the younger generation in Turkey prefers to conduct their banking activities through mobile rather than in branches or on computers, and some industry experts predict the mobile banking channel will expand rapidly.¹⁴ Between December 2012 and March 2015, the number of active mobile banking customers grew from 1.4 million to 8.1 million.¹⁵

“Mobile banking is a very important channel in terms of customer acquisition and reaching unbanked population. No other channel is as convenient as mobile banking. Therefore, banks will continue to focus on growing this channel, especially to attract the younger generation.”

-- Murat Mergin, Garanti Bank

In 2013, Garanti – which is Turkey's third largest bank as measured by share of total deposits (11.3% market share in 2013)¹⁶ - launched a mobile initiative called iGaranti. This app is aimed at generation Y (people between the age of 18 and 30) and older professionals. Garanti report that approximately 500,000 people have downloaded the iGaranti app.

iGaranti combines 23 features, including money management tools, mobile chat, an ATM withdrawal function (without the need for a card), and a voice control feature. Central to the design of the app is social media integration. There are over 30 million Facebook users in Turkey and iGaranti allows customers to transfer money to their Facebook friends without setting up their bank account details.

Integration with Foursquare, the location-based social media app, is a 'Smart Shopping' feature of the iGaranti app that offers an innovative way for users to send money and user notifications of local offers, based on their location. Within less than a month of launch with Foursquare, more than 2,000 Garanti Bank customers had connected their Foursquare accounts to iGaranti, and the Smart Shopping feature is the most frequently used feature of the app.

Since the launch of the app, Garanti has become the market leader in mobile banking: it is estimated that the bank accounts for 31% of mobile transactions in Turkey.¹⁷ This success has carried over into internet banking, with Garanti accounting for 23% of online transactions.

¹² The Banks Association of Turkey, 2014

¹³ World Bank, 2014

¹⁴ Deloitte, 2015a

¹⁵ The Banks Association of Turkey, 2014

¹⁶ This compares with the 15% market share of the leader Ziraat Bankasi and 12.8% share of Turkiye Bankasi; The Banks Association of Turkey, 2014

¹⁷ Garanti, 2015

The relative popularity of mobile banking among younger adults identified in Turkey is a feature that also appears to be reflected across other markets. For example, in the US¹⁸ the adoption rate among adults under 30 is 60% while in the UK¹⁹ the adoption rate among adults under the age of 45 is 59%.

The age profile of users gives an indication of how adoption of mobile banking may become more embedded in the future. First, while adoption rates among the older generations are currently low, this is partly due to the low smartphone penetration within that group. However, as smartphone usage grows (between May 2013 and May 2014 smartphone penetration increased from 60% to 67% among the 45-54 group and from 40% to 50% among the over 55 group),²⁰ mobile banking adoption could be expected to rise in line with this. Second, as current generation's age and they carry their practices with them, differences across the age groups would be expected to reduce further.

Other factors that are relevant to adoption include:

- **Security considerations:** In a survey of US customers from 2013, 70% of mobile users cited security as a concern and 32% of non-users cited it as the most important concern. The survey also finds that 71% of respondents say that security features are "highly important" in deciding whether to switch banks.²¹ The development of mobile banking away from SMS-based to app-based models improved the security of the service, and recent developments in the customer authentication process may improve security further.
- **Income and education status:** A report by Federal Reserve Board (FRB) shows that people with a yearly income above \$40,000 (£25,000) are more likely to use mobile banking than those with a yearly income below \$40,000, while 44% of people with a college degree use mobile banking compared to only 29% of people with a high school degree or less.²² These characteristics are particularly relevant when combined with age. For example, recent customer segmentation analysis suggests the most active mobile users are those who are both affluent and young.²³

3.2 How mobile banking impacts the market

The overall impact of mobile banking will depend on how it continues to develop and the extent to which it is able to penetrate the population of bank customers. A key question that follows, and which is addressed below, is the extent to which mobile banking acts as a substitute for bank branches.

Evidence on bank interaction suggests the impacts are still developing. Despite the UK being one of the leading markets in the world for mobile banking adoption, mobile banking is still used by significantly fewer customers than other channels of bank interaction, such as branches, ATMs and online. This pattern is also observed in the US, where mobile banking adoption is the highest.²⁴

¹⁸ Board of Governors of the Federal Reserve System, 2015

¹⁹ GfK NOP, 2015

²⁰ Deloitte, 2014d

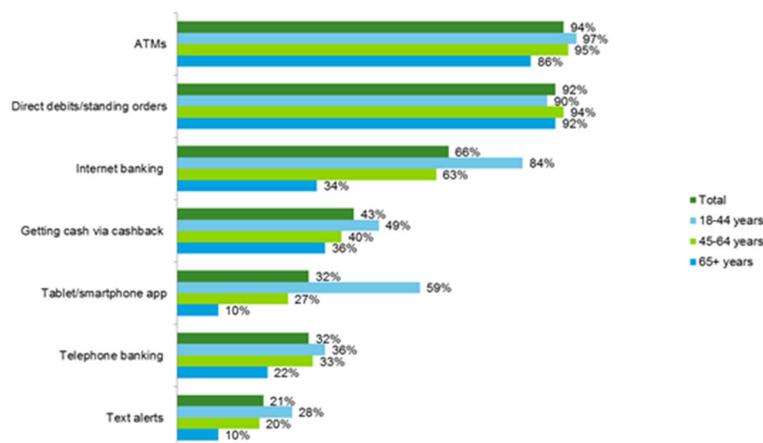
²¹ Cognizant Business Consulting, 2013

²² Board of Governors of the Federal Reserve System, 2015

²³ Cognizant Business Consulting, 2013

²⁴ Board of Governors of the Federal Reserve System, 2015

Figure 4: Accounts services used in the UK



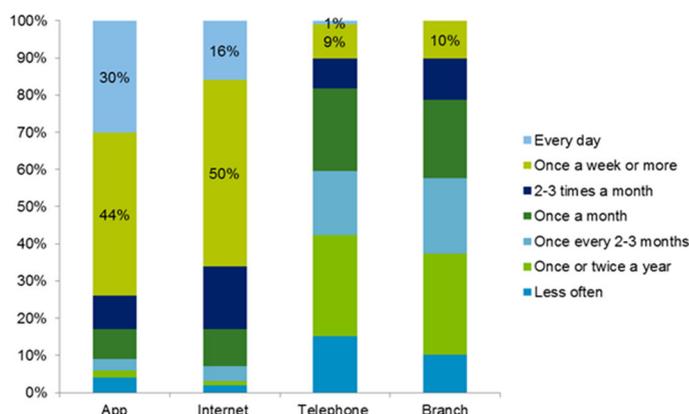
Source: GfK NOP, 2015

However, the distribution of mobile banking usage is significantly more skewed to the younger age groups for mobile banking than it is for other channels. This may indicate a potential for continued rapid growth in adoption and hence an increasing number of banks developing their mobile banking services in the future.

3.2.1 Financial awareness

For those who use it, mobile banking offers a convenient way to interact more frequently with their bank. Owing to the “on-the-go” convenience and the round the clock accessibility, the frequency with which customers use mobile banking is higher than for other channels. As Figure 5 shows, most people who use mobile banking use it at least once a week and almost a third use it every day.

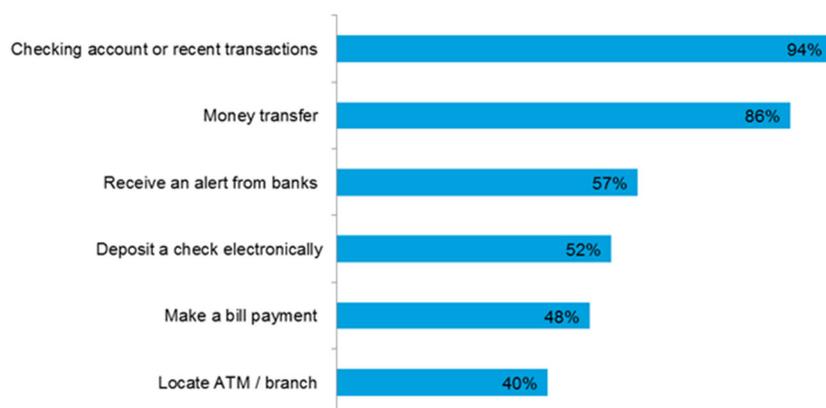
Figure 5: Frequency of service use



Source: GfK NOP, 2015

The main reason a customer opens the mobile banking app is typically to check their balance. Recent evidence from the US suggests that 94% of customers use mobile banking for this purpose, as opposed to only 48% who use it to find an ATM. Figure 6 summarises how mobile banking is used in the US.

Figure 6: How mobile banking is used in the US



Source: Board of Governors of the Federal Reserve System, 2015
 % of respondents who said they used it in the past 12 months

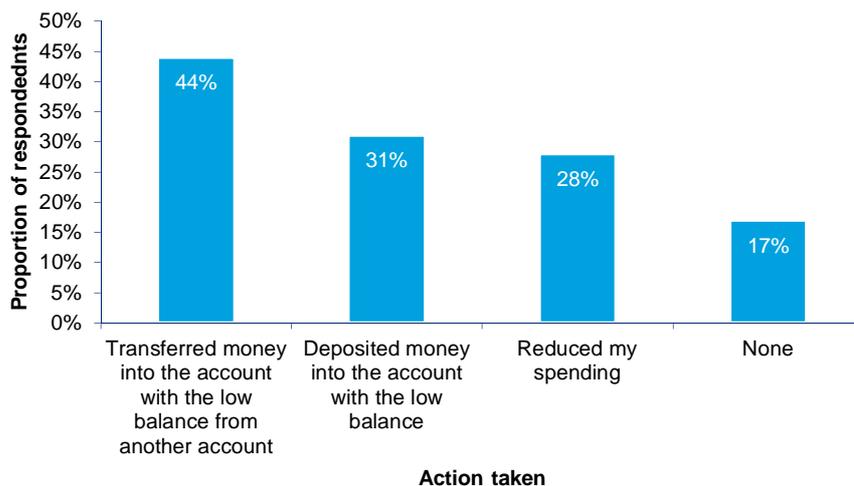
By providing a service that allows customers to monitor their balance and expenditure more easily, mobile banking has the potential to improve the sophistication with which customers manage their finances. Two key ways this could happen are:

- By helping customers realise when they could be earning higher interest rates from their accounts (by switching surplus funds to a savings account for example);
- By helping customers realise when they may be in danger of incurring charges for unauthorised overdrafts.

Moreover, given that money transfer is also an important function for which mobile banking is used (See Figure 6), mobile banking also makes it easier for customers to act on this information.

Evidence from the US and the UK supports this. In the US 63% of mobile banking users with smartphones reported that in the last year they used mobile banking to check their balance ahead of a large purchase (53% of those reported they did not make the purchase as a result). Similarly, approximately half of mobile banking users in the US receive low balance alerts and 83% of those that receive them take some action as a result.

Figure 7: Responses to low-balance mobile alerts



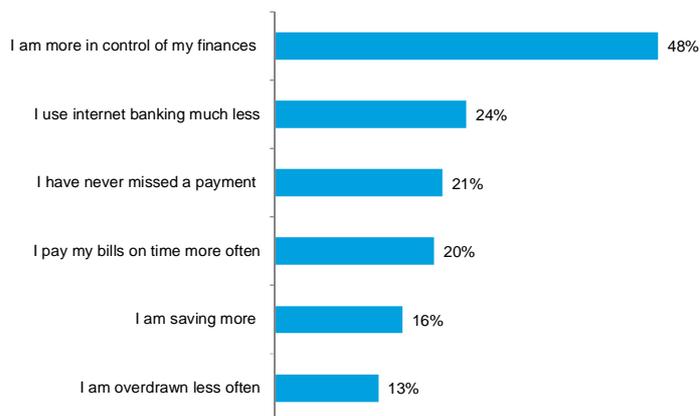
Source: Board of Governors of the Federal Reserve System, 2015

In the UK the Financial Conduct Authority (FCA) used an econometric model to estimate the impact of mobile banking and text alerts on unarranged overdraft charges. It estimated that mobile banking and text alerts reduced the incidence of unarranged overdraft charges by 8% and 5% respectively, and that when combined, they

reduced charges by 24%. It also found that mobile banking had a significant impact on the average account balances, as customers moved funds into savings accounts.

A recent survey of customers from a wide sample of countries²⁵ suggests that 48% of mobile banking users thought they were in better control of their finances as a result of using mobile banking, with a number of reasons, including not missing payments, paying bills on time and saving more cited as relevant factors.

Figure 8: How customers feel mobile banking has affected them



Source: ING, 2015

Interviews with an academic expert suggest that the financial awareness impacts on individuals are also relevant to SMEs, especially as small businesses tend to exhibit financial decision-making practices similar to individuals. In a recent survey, 42% of SMEs reported that cash-flow is a major obstacle to success and 60% said that this was driven by fluctuations in income and fixed outgoings.²⁶ Mobile banking provides an opportunity for SMEs, especially small business owners who are frequently on the go and have limited access to fixed Internet connections, to stay on top of their finances. This is particularly pertinent given that there is a relatively high representation of SMEs in sectors where there is a high degree of mobility (e.g. construction and retail).

3.2.2 Branch reliance

A potential channel by which mobile banking might impact the market is by providing an alternative to bank branches. The more mobile banking can perform the key functionality of a bank branch, the less need there is for a new entrant (or a current player seeking to expand its operations) to develop a comprehensive network of bank branches.

According to the BBA, there is an increasing trend away from branch usage. Recent research conducted by CACI²⁷ projects that customers will use mobile devices to check their accounts 895 million times in 2015, compared to 705 million branch interactions. The research also projects that by 2020 customers will use their mobile to manage their current account 2.3 billion times, which is more than Internet, branch and telephone banking combined.

Overall there appears to be mixed evidence on how bank interaction across the different channels has changed in recent years. The BBA report a decline in bank branch usage, with one major bank seeing a 40% fall in branch

²⁵ Netherlands, Luxemburg, Austria, France, Germany, Czech Republic, Belgium, United Kingdom, Spain, Poland, Romania, Italy, Turkey.

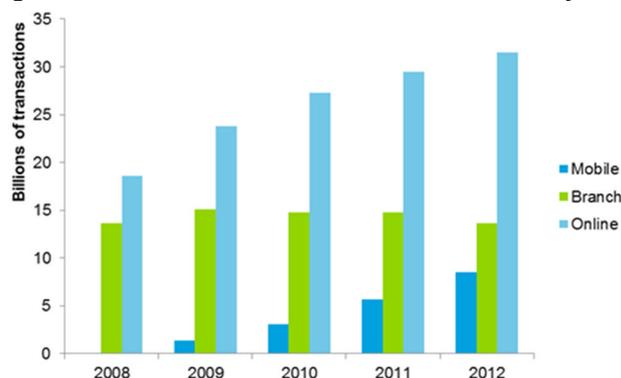
²⁶ Department for Business, Innovation & Skills, 2015b

²⁷ British Banking Association, 2015a

transactions between 2009 and 2014.²⁸ However, recent research by Accenture suggests there has been a slight increase in the proportion of people making weekly branch visits between 2012 and 2014.²⁹

Similarly, data from the US suggests that between 2008 and 2012 there was a small decrease in the number of bank branch transactions as mobile and Internet banking transactions grew.³⁰ However, there appears to be no significant change in the proportion of customers using branches between 2012 (85%) and 2014 (87%).³¹

Figure 9: Number of bank transactions in the US by channel, 2008-2012



Source: Deloitte, 2014a

Interpreting the data presents several challenges. One key issue is the extent to which any impact can be attributed to mobile banking in isolation to banks' broader digital proposition; and more specifically, the incremental impact on branch reliance of mobile banking in relation to that of internet banking.

It is also important to recognise that simple statistics, such as the number of bank interactions by channel or proportions of users that use certain channels, do not reveal the importance of the channels or the extent to which a channel can be substituted for another for the purpose of given transactions. Interviews with academic experts reveal that while mobile banking apps allow SMEs to check their accounts regularly or to initiate applications for products, the key functionality of branches has not been significantly eroded.

Interviews with industry experts in Turkey suggest that the impact of branch significance may vary by customer segment, with demographic and cultural factors being relevant. For example, in large cities young people prefer to interact with their bank using mobile banking and the increased convenience of the mobile banking app has led to some switching from not only branches, but also Internet banking. On the other hand, in smaller cities and rural areas mobile banking has had a limited impact on branch banking. While this will partly reflect differences in mobile coverage and Internet access, one local industry participant has suggested that this may also be due to a strong tradition of local banking in these areas.

Beyond the functionality that the mobile bank channel provides for customers, branches also serve banks as sales channels, which mobile apps would not be able to replace (people typically do not download an app unless they are already a customer of the bank and hence interaction with potential customers is limited over the mobile channel). Furthermore, bank branches, or some kind of physical presence, may be important for the bank to demonstrate its legitimacy. For example in Canada, the online bank, Tangerine bank, uses a small number of cafes to help achieve this.

²⁸ British Banking Association, 2015b

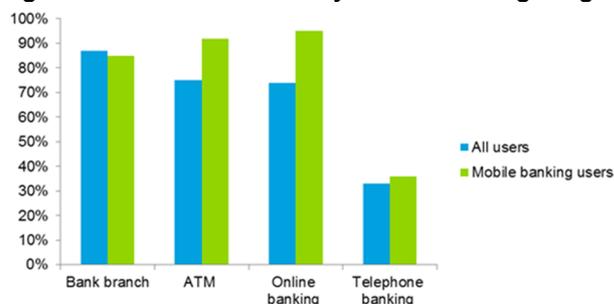
²⁹ Accenture estimate that the proportion of customers using branches weekly has risen from 12% in 2012 to 21% in 2014. Accenture, 2014a

³⁰ More recent data on transactions has not been sourced.

³¹ Board of Governors of the Federal Reserve System, 2015

Overall it appears that at its current stage of development, customers generally consider mobile banking as a complement to other forms of bank interaction. This is supported by evidence from the US about how use of the various banking services differ depending on whether the customer is a mobile banking user. This data shows that while there is a slightly lower use of branches, mobile banking customers typically engage with their bank more across a number of channels.

Figure 10: Bank interaction by mobile banking usage in the US



Source: Board of Governors of the Federal Reserve System, 2015% customers who have used the banking services in the past year

The potential for mobile banking to erode the importance of bank branches and other infrastructure in the future will depend on how the mobile banking technology develops. In particular, it will depend on whether the functionality of branches is replicable on mobiles and the speed with which customers become accustomed to using their mobile phone for key transactions. Recent survey evidence suggests that UK customers have differing appetites for digital only services – 25% say they would consider a bank that has no branches, while 33% say they would not.³²

There is little evidence to suggest small banks face challenges in keeping up with innovation in mobile banking. On the contrary, some challenger banks (or new market entrants) appear to be particularly innovative in this space. Atom Bank, for example, recently gained approval from the Bank of England to enter the market as the UK's first digital-only lender,³³ with all transactions done via smartphone or tablet. However, the bank is in the process of negotiating a deal with an established bank (as yet unnamed) to allow customers access to cash and cheque deposit services on the high street.³⁴

³² Accenture, 2014b

³³ Financial Times, 2015f

³⁴ This is Money, 2015

Case study 2: Tangerine bank – branchless banking in Canada

Tangerine bank is a Canadian online bank that also has a presence through its mobile channel, call centres and Internet cafes. It was originally launched as ING Direct in Canada in 1997, but after being acquired by Scotiabank in 2012, was rebranded to Tangerine bank. The idea behind Tangerine bank is that the bank will pass on the savings from not having a branch presence to the customer. According to recent estimates, Tangerine serves two million customers and holds deposits worth \$37 billion, approximately 1.4% of the total domestic deposit market.^{35 36}

Tangerine provides many of the services that a traditional bank might provide (e.g. savings accounts, chequing accounts, mortgages). However it differs in the way that customers are able to use the services, and the mobile app plays an important role in this. For instance, the 'Cheque-In' service enables customers to deposit cheques simply by using the Tangerine mobile app and taking a photo with their device. In March 2015, Tangerine became the first Canadian bank to offer customers signature capability via their app through 'e-SignLive', a technology that digitises hand-written signatures.³⁷ Tangerine has consistently scored highly in measures of customer service; in August 2014, a customer service survey by a global market research company ranked it top among Canadian banks.³⁸ The survey measured factors including products, personal service, self-service, facilities, communication, financial advisors and problem solution.

Tangerine is currently refurbishing its mobile app to enable customers to log in using Apple's Touch ID technology and vocally issue commands, including asking for balances, making transactions in a specific location and ordering email money transfers and bill payments.³⁹ It is expected that future developments will also allow for logging in through voice recognition. Further steps have been taken by the bank, offering the ability to log in and use the service via Facebook and they have utilised the new widget function in Apple's iOS 8 operating system to allow customers to view balances directly on their mobile screens.

Although an online bank, Tangerine also has presence on high-streets through 'cafés' that provide face-to-face contact. This suggests that there still may be strategic value to having a physical presence, even if only small. Cafés have been part of the bank's model since its launch in 1997, and at present there are five in operation in four of Canada's largest cities. The cafés are not branches and do not offer customers any of the services that a physical bank might offer, aside from advice on the services that Tangerine can offer. Instead, their presence is to provide reassurance to customers that Tangerine is a legitimate brand.

Despite the success of Tangerine, and before that ING Direct in Canada, ING Direct has had varying success in other markets, suggesting that the growth potential of online-only banks may be limited. For example ING Direct in the UK was sold in 2012 to Barclays at a loss of c. €320 million after tax, despite serving 1.5 million customers.⁴⁰ In the US, ING Direct was purchased by Capital One. While the brand has persisted in Italy, in 2011 it moved away from the online and telephone only model and opened branches in order to increase visibility and reinforce customer confidence.⁴¹

³⁵ Scotiabank, 2014

³⁶ Canadian Bankers Association, 2015

³⁷ Reuters, 2015

³⁸ J.D. Power, 2014

³⁹ <https://www.tangerine.ca/en/about-us/press-releases/PR-2014-10-01.html>

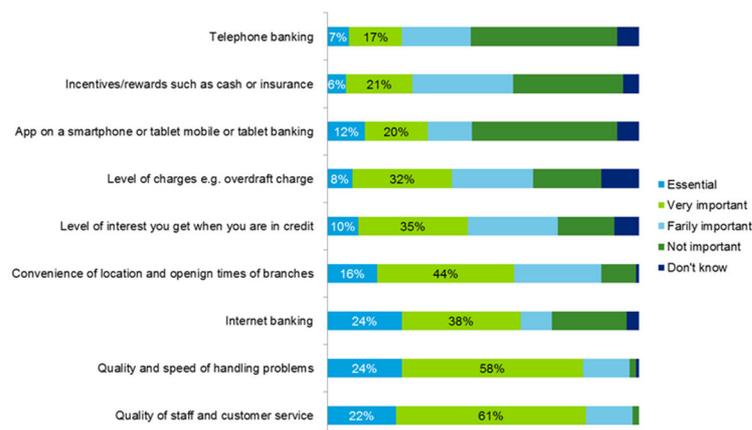
⁴⁰ ING have stated that it carried out the transaction in line with its strategy to focus on its core business. ING to sell ING Direct UK to Barclays, published October 2012. ING, 2012

⁴¹ Invitalia, 2011

3.2.3 Customer switching

The evidence presented above has highlighted how mobile banking is becoming an increasingly important channel by which customers interact with their bank. Recent research commissioned by the CMA suggests that 46% of customers already think the mobile banking app is an important aspect of the current account. However, this customer rating is still substantially below other channels (the equivalent figure for convenient access to branches is 88% as Figure 11 shows).

Figure 11: Importance of aspects of main current account bank



Source: GfK NOP, 2015

Given the growing importance of mobile banking to the way customers assess a bank's offering, mobile banking may play a role in customers' decisions to switch. Mobile banking may then become an arena for banks to compete on, and banks may seek to develop superior apps so as to attract customers from rivals.

This is supported by survey evidence from the US, which found that 60% of smartphone or tablet owners who switched primary banks in the fourth quarter of 2013 reported mobile capabilities as either important or extremely important in their decision to switch.⁴²

Moreover, evidence from a recent survey in the UK suggests that the greater engagement that mobile banking facilitates may also feed into switching behaviour (although the direction of causality cannot be established). It finds that heavy mobile banking users are more likely than average to be satisfied with their bank but also more likely to switch when they are unhappy with the service.⁴³ Interviews with industry experts in Turkey suggest that this may be more relevant as the functionality of mobile banking apps develop, as key customer segments appear to demand an increasingly broad range of services from their mobile banking app.

However, interviews with industry experts in the UK indicate that it is more likely that mobile banking apps may be used as part of a strategy for customer retention rather than for customer acquisition. They suggest that innovations are replicated so quickly in the banking sector that the incentives to compete for new customers are weakened. This is highlighted by the experience of Tangerine bank in Canada. Tangerine has a competitive edge in its ability to use technology to improve the convenience for customers, for example, in mobile banking and Touch ID technology. However, it has become more difficult for Tangerine to stand out in this field, as other banks now offer online banking along with more aggressive pricing, leading to a diminishing competitive edge. There are difficulties in estimating the relative costs of retaining or acquiring new customers, nevertheless experts claim it takes 5-10 times more time, effort and expense to gain new customers than to keep existing

⁴² AlixPartners, 2014b

⁴³ Accenture, 2014b

ones.⁴⁴ With retention of the customer base having a critical impact on success and costs, strategies targeting customer retention are becoming increasingly important.

As a result, banks may be incentivised to develop products in a way that increases the complexity of switching providers. There are two key ways this could happen:

- Banks may seek to differentiate the user experience of their mobile apps from that of their rivals, so that customers would have to learn a new way of using the mobile banking app if they were to change. This could be by having specific authentication processes, tailored reward points programmes etc. While there is little evidence of this type of lock-in effect within the banking sector, similar considerations have been discussed in relation to mobile operating systems, for example.⁴⁵
- Banks may seek to increase the functionality of the banking app, integrating payment and money management services in such a way that switching account providers would be significantly more inconvenient to the customer.

Recent FCA research highlights the potential for this. It finds a negative correlation between mobile banking adoption and full account switching. It cites the possibility that mobile banking imposes additional effort costs on consumers to switch once they have become used to using mobile banking with a specific bank as a potential explanation.⁴⁶

Thus, while potentially improving the user experience for mobile banking customers and raising engagement levels among customers, there is also the potential for further development to negatively impact on switching.

3.3 Summary

Mobile banking has developed from an SMS-based model that had limited functionality under 2G to an app-based model using smartphones that is widespread today. The technology continues to develop and there are examples from international markets of products that integrate social media, money management tools, payment methods and account opening facilities in the banking app.

The UK currently has one of the highest rates of mobile banking adoption, driven partly by the high smartphone penetration rate. When smartphone penetration is accounted for, mobile banking is still relatively prominent in the UK, but there are some countries where the development of the innovation appears to be faster (the case studies provide examples of relatively advanced mobile banking apps in Turkey).

However, mobile banking adoption remains relatively low compared to other channels of interaction and customers appear to regard other service features as more important. Despite this, the age demographic of mobile users, which is strongly skewed to the young, suggests there is potential for further growth and that mobile banking will become a more important feature of the retail banking market in the future.

⁴⁴ Stevens, 2001

⁴⁵ Kenney and Pon, 2011

⁴⁶ Financial Conduct Authority, 2015b

4 Digital wallet

4.1 What is it

4.1.1 Defining digital wallets

“Digital wallet” is a service that facilitates the storage of payment (and possibly other) credentials and enables users to make payments, either online or via a mobile device. It can take a number of forms, encompassing different technologies, channels and providers. Digital wallets can be used by both individuals and SMEs, depending on the provider, and is generally split into two broad categories.

- **Online digital wallet:** This is a service that allows customers to store the payment details of one or more cards online for use in repeat purchases. It first appeared in the late 1990s, with PayPal and eBay, and is now common on websites such as Amazon;
- **Mobile digital wallet:** This is a service that allows customers to make in-store payments with their mobile device. There are different models of payment with a mobile device, including cloud-based technology, QR code scanning and the use of NFC⁴⁷ technology to transmit credentials to point of sale devices.

Within these categories, there are a number of different types of online and mobile digital wallets. The various dimensions on which these services may vary are set out below, along with examples of the different services.

- **Service provider:** there are various types of provider of digital wallets:
 - **Technology companies:** Many of the digital wallets available are provided by technology or software companies, including leading companies such as Apple, Google and Android.
 - **Card providers:** Wallets may also be provided by card providers such as Visa and MasterCard, through the V.me and MasterPass services, respectively. However, the use of these services is currently limited to online stores.
 - **Banks:** Some banks have entered this market through the Paym app, which allows users to transfer money via a mobile phone number. The Barclays Pingit app provides a similar service and also allows users to pay by scanning a QR code.
 - **Merchants:** retailers are also moving into this market directly, for example the CurrentC service is provided by Merchant Customer Exchange (MCX), a company that is run by US retailers including Walmart, Target, Best Buy and CVS. This service enables customers to securely save, earn participating merchant loyalty rewards and pay at merchants. Retailers benefit from accepting payments through CurrentC as it allows them to avoid having to pay credit card fees to banks.
- **Technology:** Mobile digital wallets can be based on a number of technologies. These include:
 - **Smartphone-based services** that transmit funds directly using a mobile phone number.
 - **Cloud-based services**, with payment details stored in the cloud.
 - **Other apps:** Services such as Apple Pay, which stores payment details on the specific device and delivers authentication via a token generated by the app.

⁴⁷ Near Field Communication (NFC) technology enables two-way interaction through radio communication between electronic devices, allowing for contactless payment with a single touch, or at distances of less than four centimetres. The technology can also be used for accessing digital content and connecting electronic devices, though for making contactless payments it can be built into mobile phones, debit or credit cards, or stickers amongst other things. See: <http://nfc-forum.org/what-is-nfc/>

- **Use of barcodes and QR codes:** these can either involve the use of a mobile phone to scan a QR code, following which funds are deducted from the account, or the generation of a barcode on the phone, which is then scanned by the merchant.
- **Use of NFC-enabled phones** to make contactless payments.
- **Hardware-based systems:** some services involve the use of an add-on or dongle that is attached to a mobile or tablet and used to swipe cards. These services have enjoyed some success in the US, but with the UK having moved primarily to a chip-and-pin based system and the US expecting 575 million of the chip-and-pin cards by year-end, hardware-based systems are becoming less relevant to both the UK and US markets.
- **Payment system:** services may either be card-based, use direct bank transfers or store a balance. These different systems and the implications for disruption of the traditional payment model are explained in the next subsection.

The table below provides an overview of the leading digital wallet services available worldwide. As can be seen, the majority of mobile digital wallets currently available are provided by technology companies. In contrast, card providers such as Visa and MasterCard are yet to offer mobile based wallets that can be used in stores. Meanwhile, the services offered by banks are more limited in their scope with money transfers between individuals being the core service of these apps.

Table 4: examples of digital wallets

	Bank led	Card provider led	Technology company led	Merchant led
Online wallet		V.me MasterPass	PayPal	Amazon
App or software based	Paym (mobile network) Pingit (mobile network)		m-Pesa (SMS) PayPal ApplePay (Cloud-based) Google Wallet Samsung wallet (Magnetic Secure Transmission) Apple Pay Android Pay (in development)	Alipay Starbucks
NFC based			Softcard Google Wallet	
QR code or barcode	Pingit			Alipay Starbucks CurrentC
Hardware based			Intuit (add-on to swipe card) PayPal Here (Add-on card reader) Square (add-on to swipe card) iZettle (chip and pin)	

Source: Deloitte analysis

In the UK the best-known example of an online digital wallet is PayPal. PayPal allows customers to add their bank account, credit card or debit card details to a central account and then to make purchases with this central account instead of with their bank credentials. The main advantage for users of online digital wallets, such as PayPal, is that they do not have to input their bank details each time they make a transaction on the Internet,

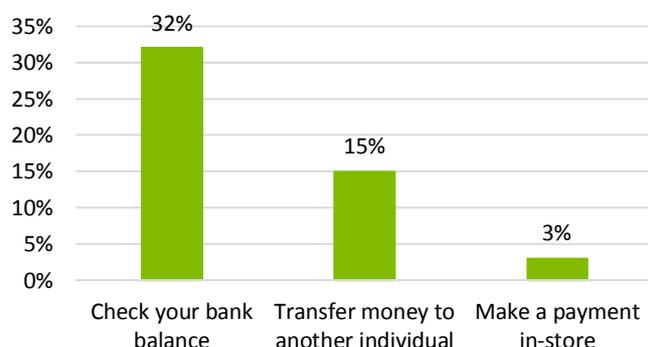
potentially providing benefits in terms of convenience and security. Similarly, PayPal, offers an equivalent digital wallet service to businesses and SMEs to receive payments for selling products or to make general purchases.⁴⁸

A similar service is provided by the V.me online digital wallet launched by Visa in 2013, which links up some of the largest high street banks in the UK. Currently, the service is only open to Nationwide customers, though the customers of other banks can register for a Nationwide digital wallet even if they do not have an account with Nationwide. Lloyds Banking Group (including the Halifax and Bank of Scotland brands) are signed up to roll out the V.me service over the course of 2015. V.me differs from PayPal in that it does not include a service for users to send money to friends, however the trusted 'Visa' brand may draw consumers who are concerned about security. Furthermore, V.me's digital wallet service is targeted primarily at individuals.⁴⁹

Mobile digital wallets are currently not as well developed in the UK as the online form. Some mobile apps such as EE's "Cash on Tap",⁵⁰ allow users to make in-store payments with their phone, but in a Deloitte survey from 2014, fewer than 3% of respondents reported having ever made an in-store payment with their phone.

Figure 12: Proportion of smartphone users who made in-store payments with apps

Question: 'Have you ever used your phone for any of the following?'



Source: Deloitte, 2014d

Weighted base: Respondents who own or have access to a standard phone/smartphone (3,676)

However, Deloitte research hypothesises that 2015 will be an "inflection point" for NFC-enabled in-store payment as providers address the prerequisites for mainstream adoption and the take-up of this technology begins to accelerate. According to recent Deloitte research, by the end of 2015 approximately 5% of NFC-enabled phones will be used at least monthly to make contactless in-store payments.⁵¹

In July 2015, Apple introduced Apple Pay to the UK market. Apple Pay, which was introduced to the US market in October 2014, allows iPhone 6 owners to use their smartphone (or an Apple watch) to make payments at NFC-equipped terminals. Users register their cards by taking a picture of the card or through using existing card information on Apple services (e.g. iTunes, AppStore) and indicating a default card that will be used, unless otherwise specified. As of June 2015, 19 high street stores and all of the major UK banks had signed up to Apple Pay.⁵² In addition to the digital in-store wallet services offered by Apple Pay, PayPal's mobile application allows

⁴⁸ <https://www.paypal.com/uk/webapps/mpp/accept-payments-online>

⁴⁹ <https://eu.v.me/uk/>

⁵⁰ <http://ee.co.uk/ee-and-me/travel-shopping/cash-on-tap>

⁵¹ Deloitte, 2015b

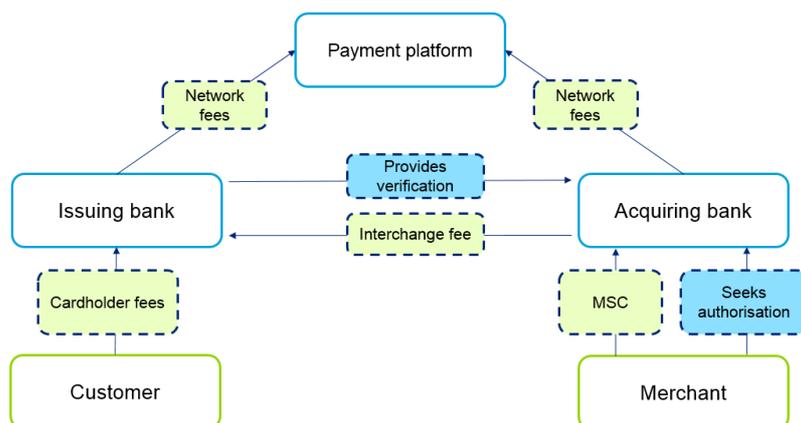
⁵² <https://www.apple.com/uk/apple-pay/>

users to pay via their PayPal wallet in participating stores, and some industry experts expect Android Pay to arrive in the UK soon.

4.1.2 How it works

This section provides more detail on how digital wallets interact with established payment systems. At present, these services are generally not supplanting the role of established payment providers or payment platforms (for example Visa and MasterCard), but rather acting as an additional intermediary to facilitate the transaction. Within the traditional four-party model of payment systems, the payment provider acts as an intermediary between the other actors, as shown in the figure below.

Figure 13: The four-party payment system



Source: Deloitte analysis on European Commission (2013)

Figure 13 shows the four-party payment system consisting of the issuing bank, acquiring bank, customer and merchant.⁵³ Under this model the consumer receives a card from an issuing bank; the consumer uses this card to make a payment to the merchant, who seeks authorisation from their bank (the acquiring bank); the issuing bank provides verification to the acquiring bank, enabling the consumer to complete the transaction; the transaction is then settled between the issuing and acquiring banks. The costs of this transaction are captured through a Merchant Service Charge (MSC) charged to the merchant, which comprises an Interchange Fee paid to the issuing bank and additional fees paid to the acquiring bank and the payment provider.

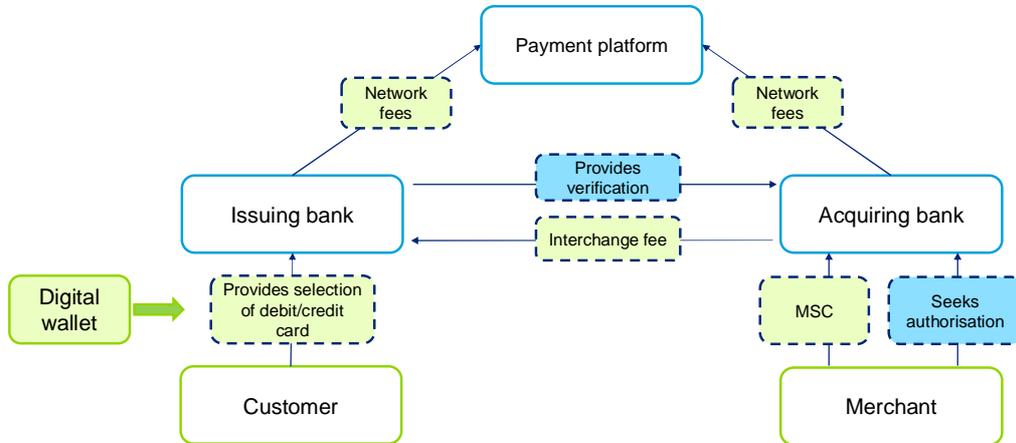
Digital wallets generally take one of three alternative forms:

1. Acting as an intermediary on transactions conducted using a card: under this model, the digital wallet does not displace any of the entities included in the figure above, but facilitates the transaction. Figure 14 describes the process. Digital wallet allows customers to select a payment type of either debit or credit card and that payment is then passed on to the four-party payment system outlined in Figure 13.
2. Enabling transactions funded via an ACH (Automated Clearing House) transfer from the customer's bank account to their digital wallet balance: this model bypasses the customer's card provider. Figure 15 describes the process where credits to sellers are directly added to their digital wallet accounts.
3. Performing a closed-loop transaction: in this case the customer uses an existing account balance to purchase goods from a seller with the same account. Figure 16 describes the process. Both the merchant and the customer have an account on the same platform that is provided by the digital wallet services. This functions similarly to a three-party payment model, in which there is no need for intermediation.⁵⁴

⁵³ Figure 13: Blue coded boxes illustrate the verification and authorisation process whereas the green coded boxes illustrate the flow of payments in the four-party payment system.

⁵⁴ American Express is an example of a three party model. American Express issues its own cards through its banking subsidiaries and employs a closed-loop network, acting as both the issuer and acquirer.

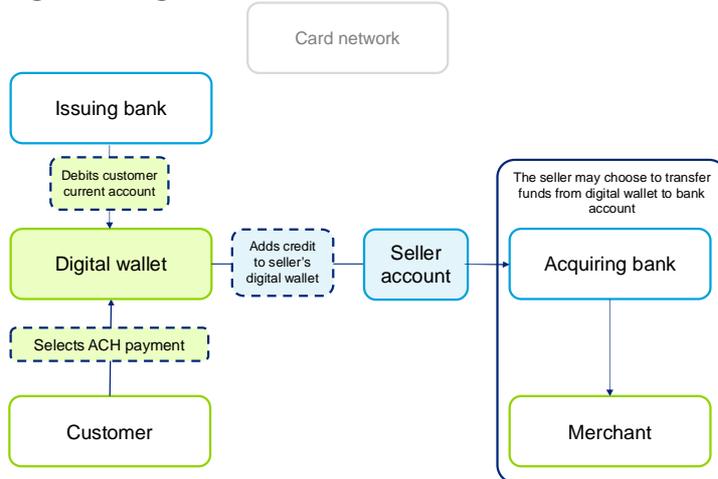
Figure 14: Digital wallets as an intermediary on card transactions



Source: Deloitte analysis

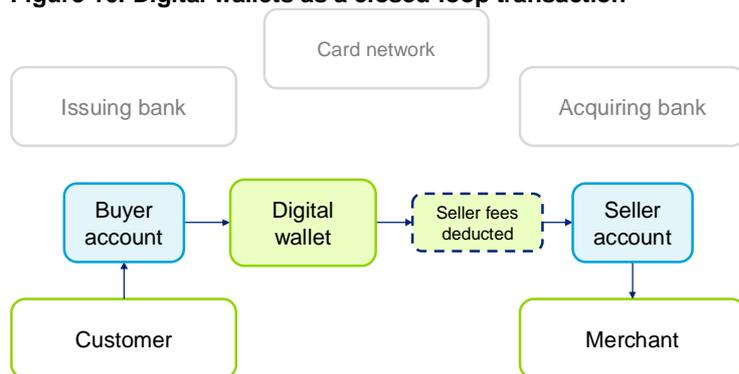
In some cases, for example Apple Pay, the digital wallet will carry out the same action as a contactless credit or debit card. That is, the mobile phone uses NFC technology in the same way as a contactless card by sending a token via the POS to the merchant bank.

Figure 15: Digital wallets based on ACH bank transfers



Source: Deloitte analysis

Figure 16: Digital wallets as a closed-loop transaction



Source: Deloitte analysis

Of these three models, the first is the most widely used among leading digital wallet providers, with Apple Pay, Google Wallet and the majority of PayPal transactions using this method.⁵⁵ Google Wallet and PayPal also offer the second model, including the option for consumers to hold a balance in their account. PayPal also offers the third option.

As noted, the first model described above does not deviate significantly from the four-party model. However, in some cases, instead of dealing directly with the issuing and acquiring banks the payment is instead processed through the digital wallet provider, which receives the payment from the customer and pays the MSC, before making a payment to the merchant. For these services, the merchant pays a transaction fee to the digital wallet provider. The table below provides an overview of these fees:

⁵⁵ In 2012 65% of PayPal transactions were funded by bank-issued cards, 25% by ACH and 10% through a PayPal balance. PayPal, 2012

Table 5: Fees and charges associated with lending digital wallets

Provider	Fees
Visa/MasterCard	<p>Country average MSC rates charged to merchants range from 0.3% to 1.9% of transaction value (on average).</p> <p>The majority of this charge comes from Interchange Fees, which are generally lowest for debit cards and highest for premium credit cards.⁵⁶ These fees may also be higher for smaller businesses that are less able to negotiate on the charge.</p>
PayPal	Between 1.4% and 3.4% of transaction value, plus 20p per transaction charged to merchants (this charge is inclusive of the MSC, which PayPal pays to the banks). ⁵⁷
Google Wallet	<p>Using Google Wallet does not incur additional charges for the Merchant. Merchants pay the usual card-processing fees (MSC).⁵⁸</p> <p>There is a per-transaction fee of 2.9% charged to individuals who add money using a debit card to their Wallet Balance. However, receiving/sending money to/from the Wallet Balance is free.⁵⁹</p>
Apple Pay	Using Apple Pay does not incur additional charges for the Merchant. ⁶⁰ However, Apple receives a rebate on the usual card-processing fees of up to 0.2% of transaction value from issuing banks. ⁶¹ This is based on the fact that improved security reduces the risk of fraud or default associated with the transaction. ⁶²

Source: Deloitte analysis on Paypal (2015b), European Commission (2013), Pocket-Lint (2015), Bloomberg (2015)

While these fees do not suggest a reduction in the average costs associated with payment processing, these alternative models of payment may nonetheless have advantages for merchants. In particular, the providers of digital wallets may be able to negotiate lower charges from the acquiring bank; this may lower the total cost of the transaction, especially for smaller merchants.

Under the alternative model, the digital wallet acts as a substitute for a credit or debit card, instead relying on ACH transfers directly from the bank. This avoids the interchange fees associated with card transactions, reducing banks' revenues from this source. These payment models, including closed-loop system, also represent a direct challenge to open-loop four-party payment providers such as Visa and MasterCard. This could potentially increase competition in this market.

4.1.3 International adoption of digital wallets

Online digital wallets are relatively established in the market place, for example with providers such as PayPal, who have been offering online digital wallet services for approximately ten years in the US. However, despite some cross-market variations, adoption remains relatively low and cards still account for significantly larger proportions of online payments. The region with the highest rate of adoption is Asia Pacific, where digital wallets

⁵⁶ European Commission, 2013

⁵⁷ PayPal, 2015

⁵⁸ <http://www.google.co.uk/wallet/business/faq.html>

⁵⁹ <https://www.google.com/wallet/faq.html>

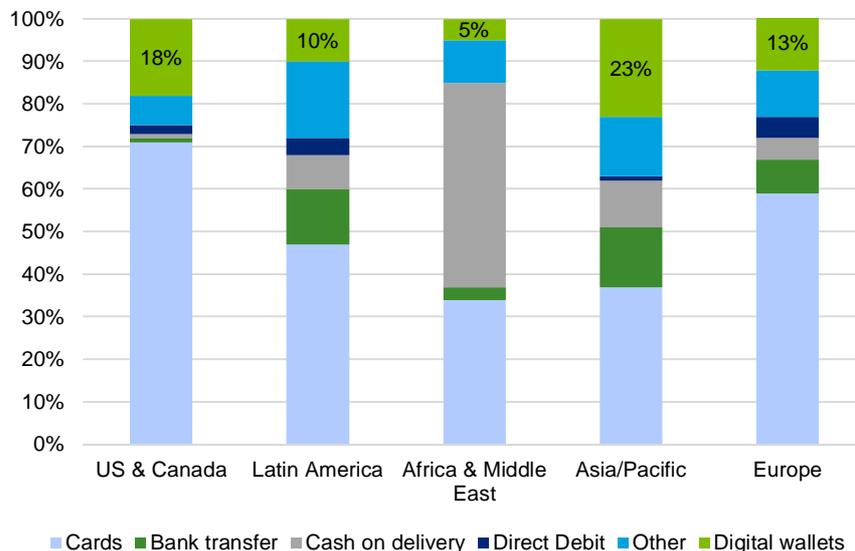
⁶⁰ <https://support.apple.com/en-gb/HT204906>

⁶¹ Bloomberg, 2015

⁶² Pocket-Lint, 2015

account for 23% of online transactions; this is led by China, where 44% of online transactions are made using digital wallets, with Alipay the market leader. Rates of adoption are somewhat lower in the US & Canada (18%), and Europe (13%). However, in each of these markets, online digital wallets are the second most used form of payment after card.

Figure 17: Mix of e-payments worldwide (2013)



Source: WorldPay, 2013⁶³

For mobile digital wallets, the level of development varies substantially across the markets. In Japan, digital wallets have been in the market since 2004, when NTT DoCoMo, the country’s largest mobile phone provider, launched a mobile wallet service known as Osaifu-Keitai (meaning “Mobile Wallet”), which enables users to make purchases using e-money or pay for transport with IC Card-based services⁶⁴ using NFC technology. Similarly in South Korea, mobile contactless payments were made available in 2006, when card issuers such as Visa Wave and MasterCard PayPass launched their mobile payment services.⁶⁵

Japan and South Korea are often cited as nations that are far ahead of others in terms of adoption of digital wallets. For both of these countries, infrastructure to enable the use of digital wallets has been integral to its success, though it is noted by the GSMA⁶⁶ that the technology used in Japan is often a proprietary version which is not compatible with deployments across other countries.⁶⁷ However, Japan is still considered a leader in the technology, with the lead provider of NFC-enabled phones NTT DoCoMo quoting 37.5 million users of Osaifu-Keitai (‘mobile wallet’) in 2011.⁶⁸

In the West, in-store mobile payment is significantly less developed, as Figure 18 illustrates and, while low, the UK’s level of adoption is in line with several other European and North American countries. Of this sample, the countries with the more advanced mobile banking technologies (Turkey and Poland) have the highest rate of in-store mobile payment. This reflects the availability of payment functionality within the mobile banking apps.

⁶³ The e-payments considered in the data likely covers both individuals and businesses.

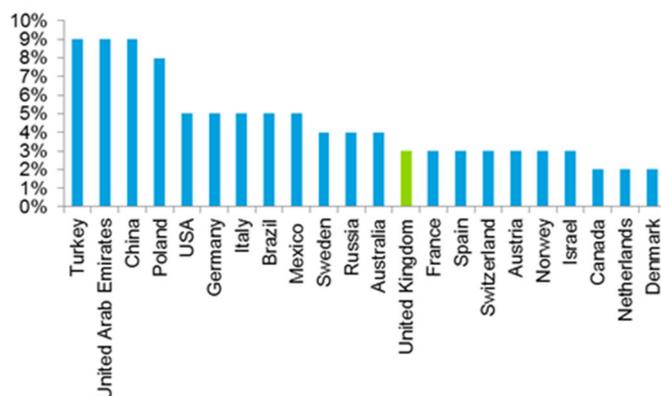
⁶⁴ Integrated Circuit (IC) Cards are rechargeable contactless cards that can be used to store data and make payments.

⁶⁵ Ernst & Young, 2015

⁶⁶ Groupe Speciale Mobile Association, the worldwide association representing mobile operators.

⁶⁷ Groupe Speciale Mobile Association, 2014

⁶⁸ Docomo NTT, 2011

Figure 18: Proportion of smartphone users who tapped their phone at a cash register to make a payment

Source: PayPal, 2015

Technology, and in particular the prevalence of NFC-enabled phones and the acceptance capability of the point-of-sale (POS) infrastructure, plays a critical role in determining adoption of mobile wallets. These issues are inter-related: the value to a retailer of a POS system that accepts NFC payments depends on the number of customers who would be willing and able to make NFC payments, whereas the demand for NFC-enabled phones will also depend in part on the availability of the relevant POS terminals.

On the consumer side, Deloitte predicts that globally by the end of 2015, 5% of the base of 600-650 million NFC-enabled phones will be used at least once a month to make contactless in-store payments at retail outlets.⁶⁹ This compares with 0.5% monthly usage amongst 400-450 million NFC-enabled phone users, as of mid-2014. This increase in consumer demand for NFC services is expected to be met by an increase in the number of merchants accepting these services. The GSMA estimates that the number of NFC-ready POS terminals worldwide is expected to expand ten times from 4 million to 43.4 million in 2017.⁷⁰ The UK has a greater number of NFC compatible terminals and so may have greater potential for adoption than other markets like the US. A market research firm, Berg Insight, projects that the penetration rate of NFC-enabled POS terminals in the European Union plus Switzerland and Norway will be 87% by 2017; comparatively, the penetration rate will be 39% for the rest of the world and 82% for North America.⁷¹

In Japan the government has played a key role in driving collaboration between card issuers, mobile providers (as well as transport authorities, which use e-ticketing), as part of an attempt to stimulate the economy and reverse deflation through cashless payments. Public ownership of key market players was significant here. The government holds a significant share of NTT (Nippon Telegraph and Telephone Corporation), which in turn owns almost two thirds of NTT DOCOMO, while inclusion of the government transport agency JR East supported the early implementation of NFC-enabled infrastructure.⁷² NTT DOCOMO also took the decision to subsidise the upfront costs to retailers of the point-of-sale technology required in developing their network. This new availability of contactless sales terminals has prompted consumers to buy into the technology, thus prompting natural growth of the network.

Another factor determining adoption is consumer awareness, which typically lags behind the level of technological development. However, as the digital wallet technology has become more prevalent in the US in recent years, so has awareness. According to recent survey evidence, awareness of mobile digital wallets among

⁶⁹ Deloitte, 2015b

⁷⁰ Groupe Speciale Mobile Association, 2013

⁷¹ <http://www.nfcworld.com/2013/06/05/324448/one-in-three-mobile-phones-to-come-with-nfc-by-2017/>

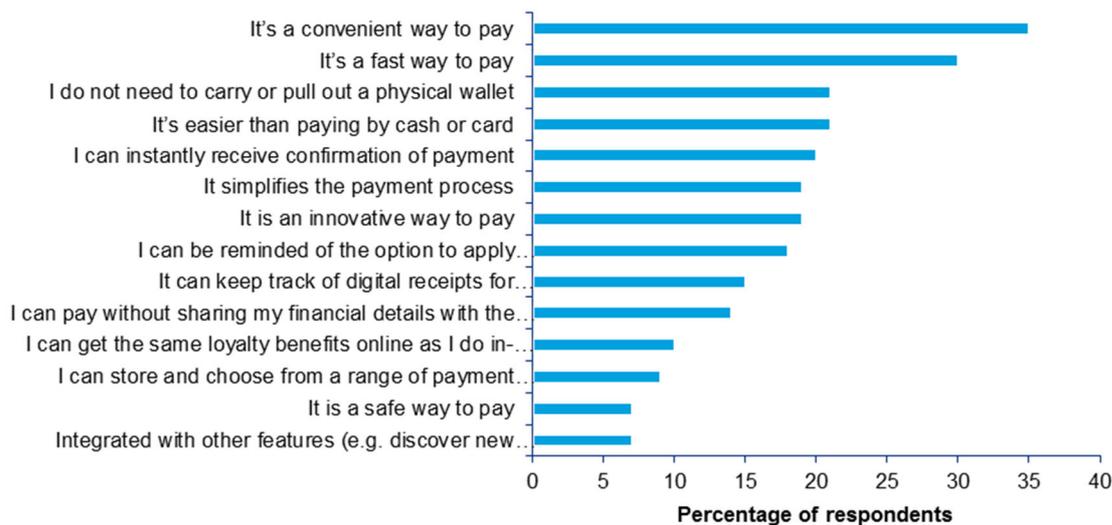
⁷² Weerakkody, 2012

US smartphone and tablet users reached 52% in 2014 (up from 41% in 2012).⁷³ Other survey evidence suggests that overall consumer awareness of digital wallets (both PC and mobile) has now reached 78%.⁷⁴ However, despite this, only 32% of consumers report having ever used a digital wallet.⁷⁵ The recent introduction of Apple Pay in both the US and the UK may help increase consumer awareness and accelerate digital wallet adoption.

4.1.4 Determinants of adoption

Beyond availability and awareness, interviews with industry experts have highlighted a number of other factors that may drive the adoption of digital wallets, and potentially determine how the innovation develops in the future. The most cited themes are security and convenience.

Figure 19: Perceived benefits of using an app for payment, 2014



Source: PayPal, 2015a⁷⁶

As can be seen from the figure above, convenience and the ability to replace a physical wallet were seen as the main advantages of app-based digital wallets. On the other hand, this evidence suggests that consumers are yet to be convinced of the benefits of combining payment with other features, such as special offers, loyalty cards and digital receipts. Interviews with industry participants have also highlighted doubts about the capacity of digital wallets to provide a significantly more convenient method of payment than card. One participant described digital wallets as simply a skin for credit cards, while another described them as “an answer in search of a question,” suggesting that these technologies are not addressing an important consumer need.

Moreover, while many digital wallet providers have cited improved security as a benefit - for example the fact that card details are not directly shared with the retailer – consumers appear to continue to regard this as a barrier. The figure below shows the main concerns cited by US consumers in connection to digital wallets. Along with security, consumers also expressed concerns about additional fees and the lack of rewards compared to credit cards.

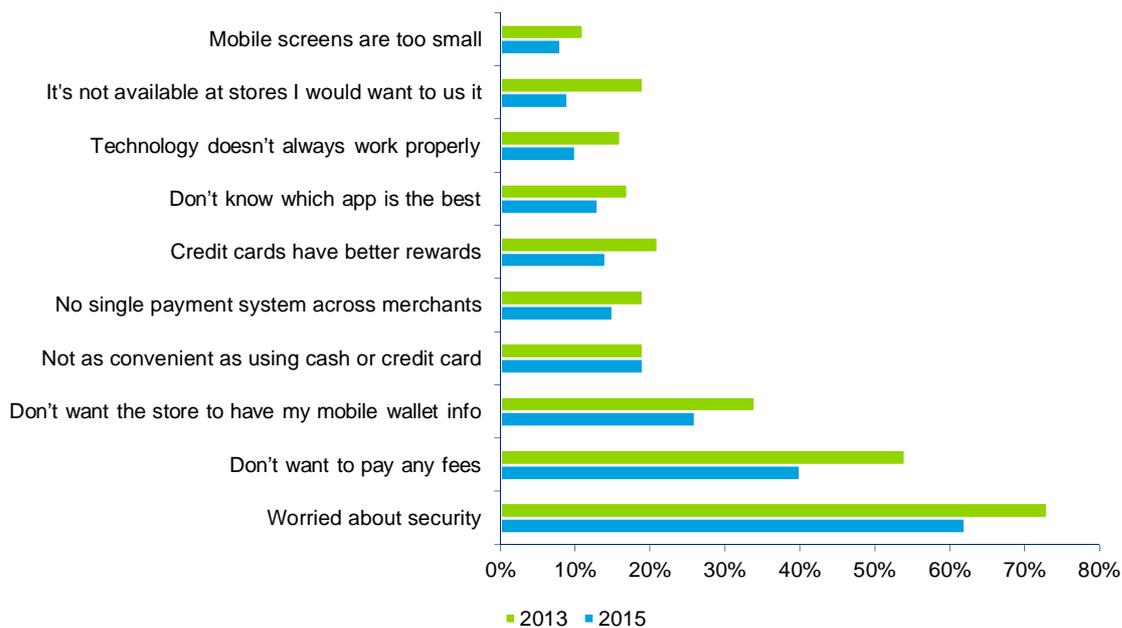
⁷³ AlixPartners, 2014a

⁷⁴ Marketing Land, 2014

⁷⁵ Marketing Land, 2014

⁷⁶ Based on a sample of 13,823 smartphone/tablet users in 22 countries. The sample considered is made up of global consumers

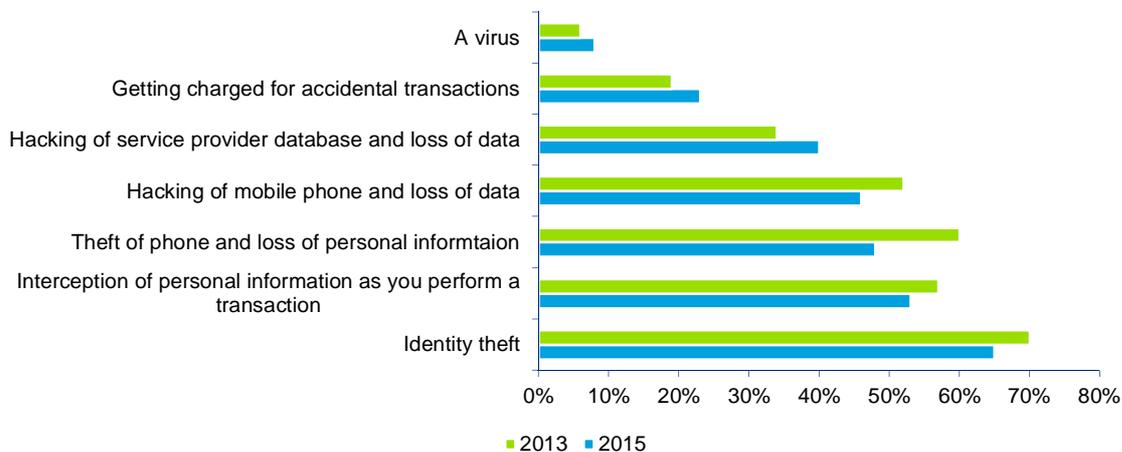
Figure 20: Reasons why US smartphone owners do not use digital wallets (2013, 2015)



Source: CMB Consumerpulse, 2015⁷⁷

Consumers' concerns regarding the security of digital wallets are explored in more detail in the figure below. Survey evidence suggests consumers' largest security concerns are identity theft and loss of personal information, either because a transaction is intercepted or because the device is stolen (although these fears have been partially allayed since 2013).

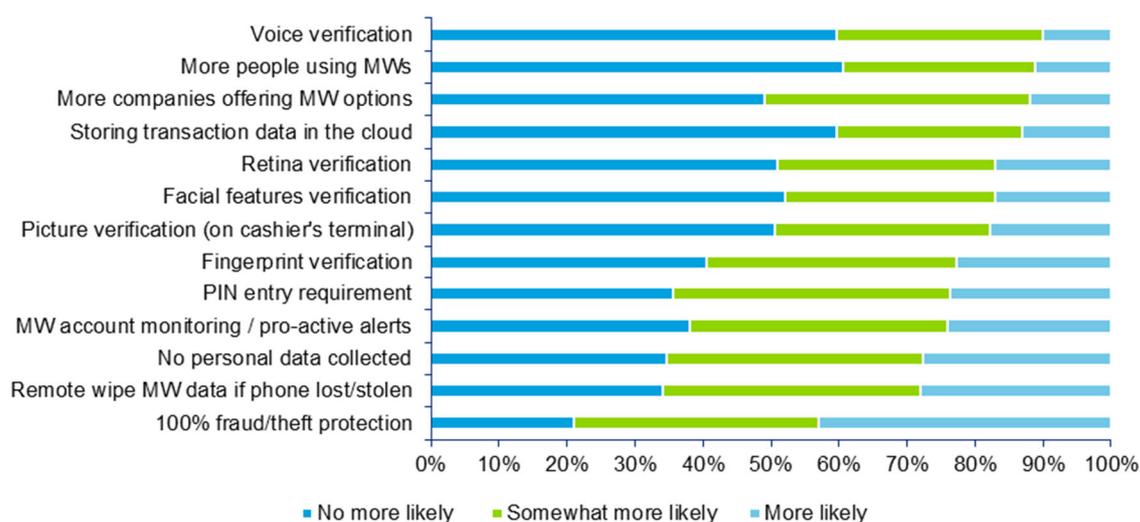
Figure 21: Most important security-related reasons for not adopting digital wallet in the US



Source: CMB Consumerpulse, 2015

As digital wallet solutions develop, these security concerns may diminish. Recent survey evidence shown in the figure below identifies 100% fraud or theft protection, reduced data collection and a functionality that allow customers to wipe data if necessary as developments that are most likely to spur adoption among non-users.

⁷⁷ Data from the survey relates to consumers only

Figure 22: Impact of new security features for adoption of mobile digital wallet (US, 2015)

Source: CMB Consumerpulse. 2015

If customers' security concerns are fully met, the development of digital wallets will nonetheless depend on their capacity to provide a more convenient payment method than the alternatives that currently exist in the market. As these vary from country to country, the development of digital wallets may take different paths in different countries. For example, while the prevalence of EMV⁷⁸ and the existing contactless infrastructure may facilitate relatively fast adoption of digital wallets in the UK once NFC-enabled phones become more common, the relative popularity of contactless cards in the UK (there are over 40 million contactless cards in use in the UK and spending via contactless amounted to approximately £300 million in 2014),⁷⁹ means that, unlike in the US, there is already a convenient contactless payment method.

While the evidence presented in Figure 21 and Figure 22 indicates that US consumers still have some reservations about the use of digital wallets, these concerns do appear to be diminishing over time, suggesting that consumers are becoming increasingly willing to adopt these technologies. It is likely that UK consumers have similar concerns, which may likewise be assuaged over time. However, this is not the only challenge to the growth of digital wallets in the UK. Interviews with market participants have suggested that the key challenge to the development of future digital wallets will be their ability to provide a better user experience for customers than what is already available. Market participants suggested that the emergence of Apple Pay could be significant here, potentially stimulating growth in the mobile digital wallet market. While adoption will be initially constrained by the fact that this service is only available on devices that use the Apple operating system (iOS), it may spur the development of similar services on other devices, potentially leading to wider adoption of mobile digital wallets.⁸⁰

⁷⁸ Europay, MasterCard and Visa (EMV) is the current global standard for chip-based credit and debit card transactions.

⁷⁹ Deloitte, 2014d

⁸⁰ For example, Google recently unveiled Google Android Pay, an update to the earlier Google Wallet, which builds on the success of Apple Pay, including the built-in use of data tokenisation, which is regarded as a security advantage of Apple Pay. Data tokenisation is the process of substituting a sensitive data element with a non-sensitive equivalent, referred to as a token that has no extrinsic or exploitable meaning or value. The token is a reference (i.e. identifier) that maps back to the sensitive data through a tokenization system.

4.2 How digital wallets impact the market

Digital wallets are still emerging as a wide-spread form of payment and there are many uncertainties over how it might evolve and impact the market. To draw these out, this section describes two potential adoption scenarios and some of the factors influencing their likelihood.

4.2.1 Breaking the link between payment and account provider

According to recent research by Deloitte most payment innovation is coming from non-banks such as PayPal and Apple.⁸¹ The payments space can be attractive to non-banks because it allows them access to a key area of customer experience and, in the transactional data that is produced, substantial information about the customer.

There are several potential implications of increased presence by non-banks in the payments space. One impact may be on the current accounts that banks control. Current accounts are traditionally where customers store their less price-sensitive deposits. It is their “working capital” and they typically bear very low (if any) interest. As such, they provide a source of low-cost funds for banks. At present, the impact on current account holdings would appear to be limited, since not all digital wallets allow consumers to hold a balance (Apple Pay, for example, does not provide this service). Although Google Wallet offers this service, it is not currently incentivising use of this facility: users pay a fee of 2.9% for making deposits into their Google Wallet.⁸² Similarly, payments made directly from an account balance through PayPal account for only 10% of transactions.⁸³

However, if non-banks continue to develop their payment offering, there is the potential that banks' current account balances may be reduced, as customers put their working capital in their digital wallet accounts instead of their current accounts. Moreover, by displacing credit and debit cards, the use of ACH- or balance-based payment models may reduce banks' revenues from interchange fees and merchant service charges.

Another potential consequence of their increased involvement in the payment space is that non-banks would be better placed to start providing financial services that are traditionally provided by banks. For example, through its Working Capital service, PayPal provides cash in advance to businesses based on PayPal payments history, while Amazon recently announced that it will offer loans of up to hundreds of thousands of pounds to SMEs that trade goods via Amazon's Marketplace.⁸⁴ Similarly, Alibaba recently launched an Internet bank in China, “MYBank”, which will seek to offer affordable loans for small and micro enterprises.⁸⁵ These organisations have relatively easy access to capital enjoyed by retailers, but the area where they would have the greatest advantage is in their access to a rich source of e-commerce data.

The availability of detailed transaction data acquired through payment systems has the potential to make these new providers particularly competitive in the market for SME loans, a market in which the issue of asymmetric information is typically pervasive. The data collected through use of payment systems (as well as inventory and customer reviews) may give them an information advantage compared to other banks and enable them to serve SMEs that may have difficulty accessing traditional forms of finance. Alibaba's Sesame Credit in China is a key example of this development (this is covered in more detail in Chapters 6 and 8). At the same time, established banks may lose their traditional advantage in this area as they no longer have visibility over the details of transactions but only see aggregate payments made through the digital wallet.

The developments in the market suggest the potential for digital wallet providers to serve specific segments of the market (such as loans to micro businesses), but at present there is limited evidence on the potential for digital wallet providers to eventually directly compete with the banks for PCAs or BCAs. While their potential to gain a share in the current account market may improve the more they become accepted as standard forms of payment, they would still face significant barriers, including regulatory barriers and capital requirements. However, by

⁸¹ Deloitte, 2014a

⁸² <http://www.google.co.uk/wallet/business/faq.html>

⁸³ PayPal, 2012

⁸⁴ The Times, 2015

⁸⁵ Financial Times, 2015a

evolving as a digital platform, they may not have the same reliance on branches that traditional market players do and would be able to position themselves as an Internet or mobile bank, similar to the way Atom bank has.

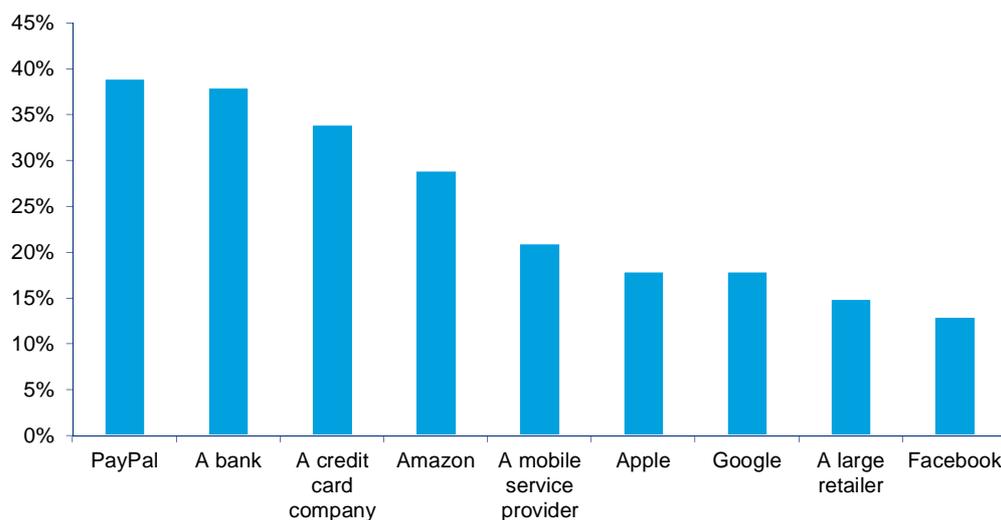
In the long term, the development of digital wallets may impact the market both directly and indirectly - directly by lowering the barriers for non-banks, such as PayPal and Apple Pay, to start providing either current account or SME lending facilities; and indirectly by impacting on the relationship between current accounts and other services that current players manage.

4.2.2 Bank-based digital wallets

The potential for digital wallets to lead to disintermediation and the weakening of the relationship between the bank and the customer will depend on the extent to which non-banks become the predominant providers of digital wallets. However, should bank-based digital wallets become the main format, the consequences for competition are likely to be very different.

The potential for such a scenario may be greater if security concerns prove to be the key driver of digital wallet adoption. This is because customers typically trust banks with their finances more than they do the main mobile digital wallet providers, such as Apple and Google, as Figure 23 shows. However, this survey also suggests that in the US, PayPal is trusted more than the banks.

Figure 23: Companies viewed as able to address security concerns associated with using phones for payments (US)



Source: *AlixPartners, 2014*⁸⁶

The potential of bank-based mobile digital wallet market is also strengthened by the complementarities that such a service could provide with other banking functions, potentially making it a more convenient format. As well as providing payment functionality, bank-based digital wallets typically offer the usual account management features of a mobile banking app, including in some cases, advanced money management tools, which can be particularly useful at the point of sale.

An example of this sort of technology is Pivo, the mobile payment app provided by the Finnish bank, OP-Group. According to an industry participant, Pivo assists the customer in the moment before the sale, by allowing the customer to easily view the availability of funds before the purchase.

⁸⁶ The data from this study is based on a survey of consumers

Case study 3: Pivo digital wallet in Finland

The Finnish banking sector is relatively small compared to the UK, but it has been a pioneer in digitalisation. For example, it was the first country in Europe to have an Internet banking service.⁸⁷ Interviews with local experts indicate that the potential for increased competition from large foreign banks and digital companies is spurring some banks to develop their offering as a response.

In May 2013, Finland's largest bank, OP-Pohjola, launched Pivo, a digital wallet application that combines several additional money management features. Like other digital wallets, Pivo uses Near Field Communication (NFC) to allow customers to pay for in-store purchases with their mobile phone. In addition, Pivo allows customers to monitor their spending, to check their balance at the point of purchase, to view their status in loyalty programmes and to use benefits in shops and restaurants.

OP-Pohjola reports that as of December 2013 over 500,000 people, roughly a third of its customer base, are active users. Two thirds of Pivo users use it at least once a week; a third use it daily. A key driver of the strategy underlying Pivo, and a potential reason for its high adoption, is its usability: its designers were awarded the Red Dot prize for interaction design in 2014.⁸⁸

The emergence of bank-based apps such as Pivo illustrates one potential development of digital wallets in the UK. According to one market participant, banks may be incentivised to develop apps such as Pivo in response to new competition from alternative providers. In this regard, such apps may reflect how competition may encourage innovation. Pivo is also an example of how digital wallet and aggregator services meet, offering a payment mechanism, but also the possibility to track expenditure.

The implications for the market of this development are similar to those relating to the development of advanced mobile banking apps. The greater the functionality of mobile banking apps, and the higher their adoption, the greater the role they are likely to play in customers' decision to choose or switch providers. Furthermore as functionality increases it is possible that the barriers to switching will increase as customers have to adapt to different standards across multiple features of the app.

4.2.3 Scenario drivers

The digital wallet market is currently at a crossroads and these two scenarios illustrate possible directions that it could take. However, they also point to potentially divergent impacts of digital wallets on competition. Under the bank-led model, the technology could offer incremental value within the existing competitive framework, whilst in the disintermediated scenario there are a range of potential challengers who could begin offering payment and other services to consumers.

⁸⁷ <https://www.op.fi/op/op-financial-group/op-financial-group/history?id=80114&srcpl=1&kielikoodi=en>

⁸⁸ Nordkapp, 2014

While it is not possible at this stage to draw conclusions on which model is likely to predominate, some insights may be drawn from the incentives on each of the market participants.

Table 6: Factors impacting adoption

	Positive factors impacting adoption	Negative factors impacting adoption
Consumers	<p>Some convenience benefits, particularly for online purchases.</p> <p>Potential security benefits.</p> <p>Product value-add may be enhanced when digital wallet services are coupled with aggregation/value-add services (either by banks or non-banks).</p>	<p>Evidence of concerns over digital privacy and security. While these appear to be diminishing the long-term implications for wide-spread adoption remain unclear.</p>
Retailers	<p>May facilitate rapid transactions, particularly for online retailers.</p> <p>By acting as intermediaries in the transaction the platforms may help to rebalance market power between smaller retailers and banks. May also be offered incentives for adoption by companies such as PayPal/Apple.</p>	<p>Based on current pricing it appears that services such as PayPal are more expensive than VISA/MasterCard, though this would presumably diminish with the scale of alternative payment services and/or the strategic intent of the payment platform.</p>

Source: Deloitte analysis

Consistent with current rates of adoption, analysis provided in Table 6 suggests that there exists barriers to adoption by retailers. As noted, digital wallet services such as PayPal may be more costly for merchants than traditional payment systems, while the need to upgrade payment technology may limit the adoption of NFC-based mobile payments systems. The initial roll-out of Google Wallet, for example, has limited acceptance from retailers, despite Google offsetting the cost of point-of-sale upgrades required to accept the technology. Since then, Google has shifted its focus to remote mobile payments rather than in-store payments.⁸⁹ Amazon, meanwhile, shelved plans to fully roll out its digital wallet, which was briefly introduced in beta form⁹⁰ in 2014.⁹¹

Given consumers' concerns over security - and the potential benefits of combining payment services with complementary services such as account aggregation - the bank-led model may have an advantage, in particular in connection to in-store payments. Clearly though, as with any of these technologies, there remain large uncertainties over actual market outcomes.

4.3 Summary

Online digital wallets, such as PayPal and Amazon, are relatively well established in the market place. However, despite being relatively common in Japan and Korea, mobile digital wallets are still rarely used in the West. Concerns about the security of mobile digital wallets and their ability to provide a more convenient payment experience have hindered their growth in recent years. However, the market appears to be at a significant juncture and the launch of Apple Pay in the UK (as well as potential future launch of Google's Android Pay) may mean these payment forms become more prevalent.

⁸⁹ Forrester, 2014

⁹⁰ The beta form comprises the second phase of software testing in which a sampling of the intended audience tries the product out.

⁹¹ CNET, 2015

It is still too early to say what the impact of these developments might be on the retail banking market and the overall effect will depend on how the market evolves. Some third party providers, such as PayPal and Amazon, have already extended their reach into the space traditionally occupied by banks, providing credit to SMEs and allowing customers to charge accounts, but there is currently limited evidence on the significance of the impact of these plays on banks. While there may be potential for disruption by such players, this is yet to materialise. Equally, evidence from other markets highlights the possibility that bank-led mobile digital wallets will emerge as alternatives to third party providers. These payment forms have the advantages of being able to more clearly satisfy customers' security concerns and being able to combine alternative features of mobile banking, such as account checking and aggregation services, in one place. Should this model become more prevalent, some of the considerations that are relevant to mobile banking would be relevant here, particularly the role of increased functionality in impacting customer switching.

5 Aggregators

5.1 What it is

5.1.1 Defining aggregators

The growth of the Internet has facilitated the development of aggregators, services that collect and collate information from a number of sources in order to facilitate comparison and analysis. For the purposes of this paper, two types of aggregators are considered.

- **Comparison aggregators:** These are services that collect and display the same information for a similar product or service for comparison purposes, for example a price comparison website like Moneysupermarket.com;
- **Account aggregators:** These services are intended to help customers manage their personal finances and monitor their spending and saving patterns. These aggregators may collate information from across multiple accounts in order to provide customers with a consolidated overview of their finances. Some aggregators go further and also allow users to manage their accounts directly through the service.

There are two main methods of providing these services: screen-scraping, which directly reads information from other sources, and Application Programming Interfaces (APIs).

Screen-scraping has worked for comparison aggregators, but account aggregators require that customers share their login credentials with the third party organisation. APIs allow customers to share their financial data with third parties without the need to provide login details, which enables financial technology firms to make use of bank data on behalf of customers in innovative ways.⁹² These have been used by firms such as Mint and Money Dashboard in the US and UK respectively to provide money management services to customers. A recent report for HM Treasury and Cabinet Office noted there is a consensus that the screen scraping method used by many services to obtain data has limitations and therefore there is a desire for banks to provide external APIs.⁹³

Comparison aggregators

Comparison aggregators have been offered in the UK market for about two decades, covering a wide variety of products, including financial services. Their core service is the aggregation of information on all providers of a particular product – for example, insurance or personal current accounts – which enables the provider to present the customer with a list, usually ranked by price. The ease of comparison and increased awareness of all providers in the market can potentially persuade consumers to choose lesser known providers of which they may not otherwise have been aware, thus lowering barriers to entry.

Price comparison sites are now used by more than 10 million people in the UK every year.⁹⁴ These aggregators have been particularly successful in the UK financial services industry, where there are roughly 48 providers,⁹⁵ with over 70% of Internet users having used such a site.⁹⁶ Within the financial sector, these websites offer comparisons for a number of financial products such as current accounts, mortgages and savings accounts. These sites have already secured a large proportion of the general insurance market in the UK, and are

⁹² HM Treasury, 2015

⁹³ HM Treasury, 2015

⁹⁴ Deloitte, 2014c

⁹⁵ Consumer Focus, 2013

⁹⁶ Mintel, 2013

beginning to take a significant share of the unsecured personal loan and credit card market. Notably, they have gone from non-participation to a 10% share of deposit flows in less than three years.⁹⁷

Data on the extent to which price comparison sites are used for personal current accounts, as opposed to other financial products such as loans and savings accounts, are limited. The 2011 Independent Commission on Banking (ICB) report found that only 2.4% of PCA customers cited comparison sites as an important factor in their choice of account; the report indicates that figures for BCA customers are similarly low.⁹⁸ The report also argues that price comparison services are generally ineffective for current account services and that the sites have little incentive to improve their services.

More recently, a 2014 report for HM Treasury has suggested that the usefulness of these services in connection to PCAs is limited, given that their advice is often fairly generic because they tend to compare on a narrow set of factors, while in practice costs can vary substantially depending on account usage.⁹⁹ Without detailed information on consumers' financial histories, for example, the time spent in credit versus in debit, it is difficult to make an accurate comparison of the aggregate costs for consumers. The Treasury is taking steps to address the current limitations through the Midata scheme, discussed in more detail below.

For current account comparisons in particular, the Money Advice Service lists the following sites¹⁰⁰ as being the most popular price comparison websites in the UK: Go Compare, Money Saving Expert, Money Supermarket and uSwitch. While data on the revenues attributable to current account comparison services specifically are not available, the largest companies received approximately £800 million in revenue during 2013, with average annual profits increasing by 14%.¹⁰¹ The primary sources of these revenues are:¹⁰²

- the commission they receive from the companies that list products on their websites;
- companies advertising on their website; and
- sponsored listings whereby companies pay to have their products appear at the top of the search results.

Account aggregators

Relative to comparison aggregators, account aggregators have generally had a more limited presence in the UK, despite such services having been available in the UK in some form since 2001. However, these services have proved more popular in other markets, notably the US, and a number of companies have now entered the UK market. These emerging services are being provided both by banks, to improve their customer service, and by third party organisations, who took advantage of the gap in the market for such aggregation services.

Incumbent banks such as HSBC, Barclays and Lloyds are offering their customers within-bank money management tools additional to their Internet banking services that enable them to aggregate information from across multiple accounts held with the bank. These services allow consumers to track and manage their money in accounts held at the incumbent. By analysing consumer's data and spending patterns, banks are better able to target specific financial products to the right consumers. However, many consumers using online banking have accounts with multiple providers, and therefore account aggregation at one bank does not provide the individual with their overall financial picture.

⁹⁷ Deloitte, 2014c

⁹⁸ Independent Commission on Banking, 2011

⁹⁹ HM Treasury, 2015

¹⁰⁰ <https://www.moneyadviceservice.org.uk/en/articles/price-comparison-sites-guide>

¹⁰¹ The big four refers to the leading price comparison sites in terms of market share, across the full range of products and services covered: Money Supermarket, Compare the Market, Go Compare and Confused.com. The revenue figure comes from a Warwick University working paper. Ronayne, 2015

¹⁰² Moneywise, 2012

A number of third party apps are aiming to address this gap in the market. At present, the UK's most popular personal finance app is OnTrees.¹⁰³ The free iPhone app aggregates credit card, loan, billing and current account data to show users how they are spending their money; Money Dashboard is another free app offering a similar service. Both apps, akin to many other UK banking apps, run on a US-based platform called Yodlee, a major data-cloud service provider to global banks. It also sells data feeds of UK bank customers to UK app start-ups that hope to make money by selling insights into consumers spending habits.

Historically, comparison aggregators and account aggregators have been distinct services. However, based on discussions with industry participants and a report by HM treasury,¹⁰⁴ these two services may become more integrated in the future. The launch of a government initiative in 2011 called Midata could represent the beginning of this trend. Midata gives consumers access to the electronic data that businesses hold about them in order to help them make informed decisions about which service providers to use. The government's main focus is on personal current accounts, credit cards, and energy and mobile phone companies. The UK's biggest banks have already signed up to this service and recently the service has been launched by gocompare.com in order to match people with a current account that suits them. Other comparison sites are likely to follow suit and also offer Midata comparison services to consumers in the future. At present, however, this service is limited to personal current accounts and does not extend to business accounts or other SME banking products.

5.1.2 International development

The use of comparison aggregators is generally more prevalent in the UK than other markets, although reports from the Treasury and the ICB note that the use of these services in connection to PCAs and BCAs remains limited. However, the opposite is the case for account aggregators, where the UK market is significantly less developed than more mature markets such as the US and Australia, especially in the use of third party account aggregation services that collect information from multiple accounts.

According to a 2013 survey commissioned by the European Commission,¹⁰⁵ the UK is the leading market for price comparison websites in the EU. Specifically, their survey found that 83% of consumers had used comparison tools at least once in the past 12 months. Other key markets identified in this survey were Slovakia (77%), Poland and Italy (both 78%), and Czech Republic (79%). The gap between the UK and other European markets becomes more pronounced when considering financial services specifically: customers in the UK were found to be more than twice as likely to use price comparison websites for financial services than customers elsewhere in Europe (with the exception of Ireland). Price comparison websites also appear to play a smaller role in the US banking market, which may be attributed to the higher prevalence of local banks and employer-affiliated credit unions, making market-wide comparisons less relevant to many consumers.

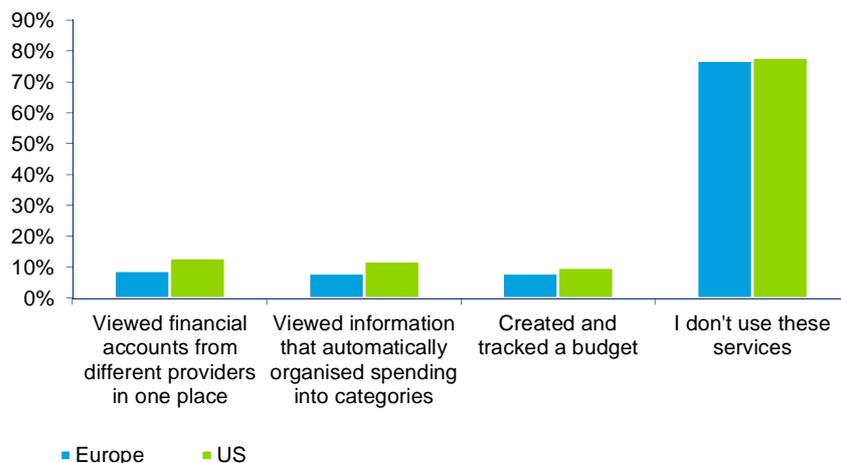
While the UK would therefore appear to be a market leader in terms of the use of price comparison aggregators, account aggregation services are playing a greater role in many international markets. Based on interviews with industry participants, the US has the most developed market for account aggregators, in particular those provided by third parties and aggregating data from multiple banks. As shown in the figure below, in both the US and Europe about 22% of Internet users use online or mobile money management services; however, US consumers are about 50% more likely to use services that aggregate information from multiple financial providers.

¹⁰³ There are no current figures available. However, in the first three months of its launch, OnTrees helped users track an estimated £100 million of transactions. SourceWire News Distribution, 2013

¹⁰⁴ HM Treasury, 2015

¹⁰⁵ This survey was carried out by Ipsos, London Economics and Deloitte in September 2013 on the comparison tool sector and their influence on consumers' decision making. ECME Consortium/Deloitte, 2013

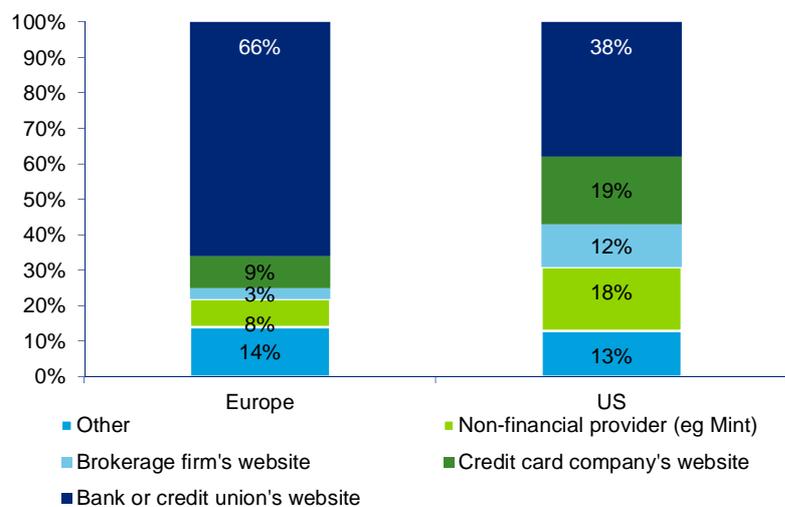
Figure 24: Use of online/mobile money management tools or features by Internet users



Source: Forrester, 2014a

In particular, the US market is more advanced in the use of aggregation services provided by third parties, with these services being more than twice as popular in the US market. In contrast, European consumers are more likely to make use of services provided by their bank or credit union; such services are less likely to aggregate information from other financial providers.

Figure 25: Most popular providers of money management tools



Source: Forrester, 2014a

The current players in the US are Mint,¹⁰⁶ Moven¹⁰⁷ and Simple.¹⁰⁸ They provide a range of services, allowing consumers to track their spending and saving patterns and manage bills and payments. Moreover, these apps are making use of the detailed financial data that they hold on consumers to recommend new products and services such as savings instruments. By acting as an intermediary between consumers and their primary bank, these services may weaken the competitive advantage enjoyed by many banks and increase switching in the market.

¹⁰⁶ <https://www.mint.com/>

¹⁰⁷ <https://www.moven.com/>

¹⁰⁸ <https://www.simple.com/>

Despite these developments in the market, evidence suggests that these tools may need to evolve further in order to fully address consumers' needs. For example, 50% of US consumers believe that banks should provide money management tools, 46% want their bank to analyse their spending and 51% want their bank to proactively recommend products and services.¹⁰⁹ However among consumers that actively budget, only 15% of consumers are taking advantage of tools provided by banks.¹¹⁰

Australia and New Zealand are other markets in which account aggregators have a significant presence. Notably, these services now include products specifically aimed at SMEs. One example is Commonwealth Bank in Australia, which launched Daily IQ,¹¹¹ a first-of-its-kind mobile app that gives business customers access to insights about their cash flow, sales and the market they operate in, presented in easy to understand visuals to enable business owners to better understand the financials of their business. Similar services are provided by Xero in New Zealand. As well as helping SMEs to manage their finances, these services also provide key market information that can aid business decision-making and planning. This type of big data is often only attainable by large companies due to the high cost, but Daily IQ is available to all businesses, including SMEs, allowing them to increase their competitive advantage.

Money management services for SMEs: case studies

The Daily IQ and Xero apps provide a number of services to SMEs, encompassing money management, the reconciliation of data across multiple accounts, and the collection and analysis of customer and transaction data.

Daily IQ is provided by the Commonwealth Bank in Australia and provides a number of services through the iOS operating system. These services include:

- tracking and management of cash flows and payments across multiple accounts;
- insights into customer demographics and spending patterns in order to help SMEs improve their marketing and identify potential new targets. While the bank cannot provide data on individual customers, it can share aggregate data on the demographic characteristics of customers, their average spending and the number of unique customers; and
- insights into sales trends, in order to analyse consumer demand. This includes analysis of sales across multiple locations and by time of day.

A similar service is provided by Xero's mobile app. However, in contrast to Daily IQ, the service is not provided by a bank, but rather by an established provider of accounting software. This service is more focussed on business accounting and enables SMEs to manage their business accounts from a mobile, reconcile data from different sources, manage invoices online and obtain a real-time view of their cashflow. Xero can also serve as a platform for other applications, including tools for additional analysis of transaction data.

5.1.3 Barriers to development

There are a number of potential barriers to the development of both price comparison services for PCA and SME banking and account aggregation services that operate within and across different providers and products. These barriers exist on both the consumer side and the firm side.

On the consumer side, aggregators face concerns about data security. Consumers have reported that they are more reluctant to share their bank details with third parties, including aggregators and price comparison sites.¹¹² Not only do these concerns directly affect the take-up of account aggregators, but they also mean that customers

¹⁰⁹ Accenture, 2014c

¹¹⁰ Accenture, 2014c

¹¹¹ <https://www.commbank.com.au/business/online-banking/commbiz/daily-iq.html>

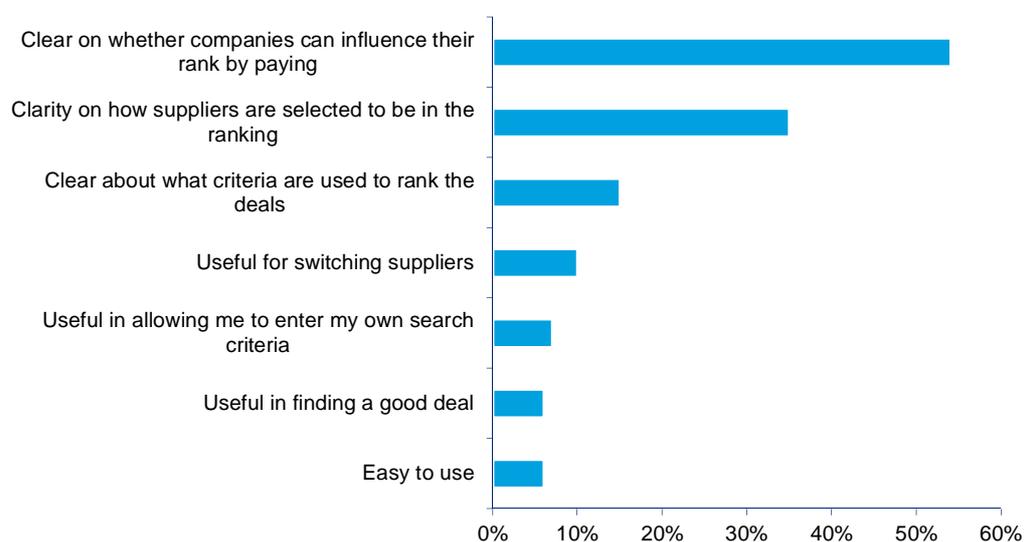
¹¹² Consumer Futures, 2014

are less likely to switch accounts directly through these services. This suggests that, although these sites are accounting for an increasing share of deposits, they are unlikely to experience the same success as they have in insurance markets.

In addition to potential concerns about data security, there is also some scepticism about the role of price comparison sites and their transparency. One concern is commission. A YouGov survey in 2011 found that consumers thought they paid between 5% and 10% in commission when they bought something through a comparison website - in reality, the average commission was 24%.¹¹³ The industry has also faced criticism due to a lack of transparency, potential conflicts of interest and inaccuracy.¹¹⁴

These concerns are reflected in the fact that consumer trust of price comparison sites appears to be limited. A poll for Moneywise.co.uk that asked consumers if they trust comparison sites to find a good deal indicated that trust and confidence in them is mixed,¹¹⁵ as shown in Figure 26. In particular, only 7% of respondents said they fully trust comparison websites and always use them to choose their products, compared to 26% that said they do not trust them at all.

Figure 26: Percentage of consumers ranking comparison sites as "poor" on different criteria



Source: RS Consulting, 2013

Another challenge these companies face is the fact that price comparison websites can compare on pricing information but the complexity surrounding fees, overdraft rates and interest rates means that without better information on the consumer the recommendations provided by these sites may be of limited value. Moreover, these sites do not reflect other metrics such as branch access, quality of online and mobile banking services, or the level of customer services. These additional considerations may be more important for SMEs, given that evidence suggests that SMEs value factors such as branch access, tailored financial services products and relationship managers with industry-specific knowledge more highly than individual customers.¹¹⁶ Some of these issues could potentially be addressed as the market evolves and some of the distinctions between comparison sites and account aggregators are broken down. For example, the Midata project discussed above would enable consumers to compare the estimated value of different current accounts based on their own financial history.

¹¹³ MoneyWatch, 2011

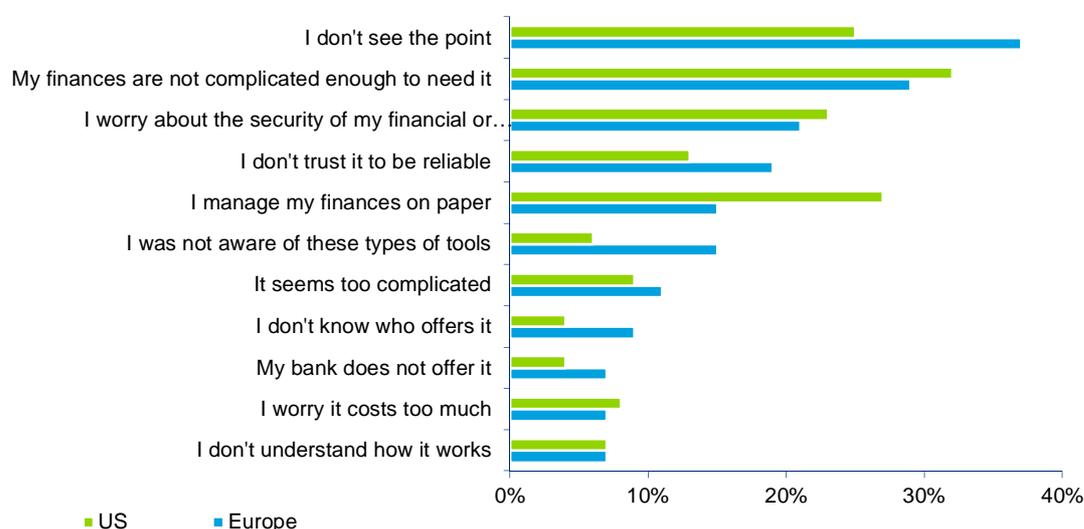
¹¹⁴ BBC News, 2014

¹¹⁵ Money wise poll on 1019 people. For results see <http://www.moneywise.co.uk/polls/do-you-trust-comparison-sites-to-find-you-good-deal>

¹¹⁶ Accenture, 2013; British Banking Association, 2014

Turning to account aggregation services, survey data from Europe and the US suggests that, along with security concerns, growth in the market may be limited by a lack of consumer interest in or need for these services. In Europe in particular, consumers were less likely to be aware of these services or to regard them as useful.

Figure 27: Reasons for not using online/mobile money management tools



Source: Forrester, 2014a.

On the supply side, one challenge is obtaining access to the data held by banks and other financial services firms. There are a number of reasons why banks and financial services firms may prefer not to share this data:

- Concerns regarding privacy and security, and the legal and reputational risks that might surround a breach of security caused by a third party service;
- A desire to retain sole access to proprietary data; and
- A desire to retain the direct connection to the customer rather than selling their products through a third party site.

For example, in the insurance market, Aviva took its products off price comparison websites in 2008. In the Polish market, Alior attempted to develop its own account aggregation service, with customers providing login details in order to enable the service to access information on accounts held with other banks. This was met by a challenge to the regulator from rival banks, which also withdrew access to their information. The FCA has also noted that account aggregation services in the UK may have been “inhibited by risks around sharing of security information”, highlighting the fact that many banks’ terms and conditions prohibit the sharing of this information with third parties.¹¹⁷

A final factor that may explain differences in development across markets and why the UK market for account aggregation remains relatively under-developed is the lack of regulatory support surrounding these services. In 2001 the Financial Services Authority (FSA and now FCA) stated that “*aggregation is neither an ‘authorisable activity’ nor a financial promotion and is therefore not a regulated activity. Anyone, whether authorised or not, can provide an account aggregation service*”. Lack of regulation or explicit warnings from the regulators have also acted as a barrier to the take up of these services in other markets. For example, the Financial Consumer Agency of Canada has issued a statement reminding consumers to “be aware of the possible risks of disclosing their online banking and credit card information to anyone, including financial aggregation services,”¹¹⁸ urging

¹¹⁷ Financial Conduct Authority, 2015a

¹¹⁸ <http://www.fcac-acfc.gc.ca/Eng/about/news/Pages/News-nouvelles.aspx?itemid=31>

customers to carefully review their banks' terms and conditions before using these services. Similarly, warnings have been issued by the South African Ombudsman for Banking Services.¹¹⁹ In contrast, US account aggregators are regulated by the Federal Financial Institutions Examination Council. Having regulation in place lessens the risk consumers and banks have by providing their financial information to third party account aggregator services. This, coupled with the more risk-averse nature of UK individuals around data sharing, could have made it more difficult for FinTech firms to set up in the UK.

However this barrier may no longer exist in the future. The EU is currently working on a payments directive (PSD2)¹²⁰ that will regulate account aggregators. These proposals would require that banks allow third parties licensed to provide payment services access to customers' account information, providing that the customer has explicitly given their consent. Under the same legislation, customers would have to be provided with information on the extent of this access. This would also place obligations on the providers of digital wallet services; for example, they would be required to implement two-factor customer authorisations before allowing customers to access account details or make a transaction. Furthermore, in January 2015, the FCA published a report into the savings market¹²¹ which explored ways of breaking down the barriers which have stopped account aggregators from succeeding in order to promote a more competitive financial market.

According to the FCA, there are barriers driven by both the financial institutions and consumers. On the firm side, many UK banks' terms and conditions prohibit the sharing of such information by customers to third parties, which can limit the effectiveness of competition given the importance to consumers of convenience of accessing accounts in one place. This has also been seen in Japan, where account aggregators can only perform screen scraping to collect information from financial institutions that have agreed to co-operate beforehand.

5.2 How aggregators impact the market

5.2.1 Comparison Aggregators

Comparison aggregators allow consumers to be more financially aware about the financial products they are purchasing, which could promote switching behaviour. While evidence in this area remains limited, the potential implications for customer behaviour are discussed below.

Impact on customer financial awareness and switching behaviour

One of the main advantages of price comparison websites is that they provide consumers with an overview of the market for a particular product allowing the customer to make a more informed decision in a convenient way. By increasing a consumer's financial awareness, consumers may be more likely to switch providers. A report by RS Consulting for Consumer Futures (2013)¹²² analysed the reasons that consumers used price comparison websites and found that 67% of those that use price comparison websites use them for switching purposes, as shown in Table 7 below.

¹¹⁹ Personal Finance, 2012

¹²⁰ For more information see: http://europa.eu/rapid/press-release_IP-15-4916_en.htm?locale=en

¹²¹ Financial Conduct Authority, 2015a

¹²² Consumer Futures, 2014

Table 6: Reasons for using price comparison websites

Reason for using price comparison website	Percentage of people surveyed who used price comparison website for that reason
Bargain hunt to get the best deal	85%
Compare prices	83%
Save money	79%
Identify providers	69%
Switch (either directly with supplier or through the price comparison website)	67%

Source: RS Consulting, 2013

The research indicates that the use of price comparison websites as a switching or purchasing portal has increased. However, a survey of online consumers for the OFT's Advertising of Prices¹²³ market study published back in December 2010 found that only 15% of those surveyed purchased through a price comparison website. This figure is expected to be significantly lower for PCAs. In particular, since 2011, data indicates that only 2.4% of PCA holders cited price comparison sites as a factor in their choice of banking provider.¹²⁴

However, the emergence of the Midata service and the blurring of the line between price comparison sites and money management services suggest that comparison services could play a greater role in this market in the future, with ramifications for the market share of some of the UK's biggest banks. In particular, comparison websites enable smaller banks to advertise and offer financial products without the need to have a well-known brand name. A 2014 Stickyeyes Financial Services Intelligence report¹²⁵ revealed that Money Supermarket, Confused.com and MoneySavingExpert combine to take more than 60% of online search traffic across the financial services sector at the expense of established banking and financial services brands. In the current accounts market, direct retail brands accounted for 80% of the ten most visible brands in the market in 2012-13 but 12 months later, this had fallen to 50%. In particular, HSBC suffered a 77% loss of market share of online search for current account products compared to 18 months ago.

Moreover, comparison aggregators are becoming equally sophisticated users of data, including designing their own loyalty and rewards structures. This makes it increasingly difficult for banks to make the case for proprietary channels. The combination of shifting regulatory focus and the rise of aggregators means banks may have to work much harder to retain value from customers.

There is little empirical data that provides analysis of the effects of comparison aggregators on switching behaviour, specifically with respect to personal current accounts and SME banking. As bank account switching has been historically difficult and cumbersome to execute from a consumer perspective, the impact of price comparison sites may be limited. However, the introduction of the current account switch guarantee¹²⁶ in 2013 may increase opportunities for price comparison sites to influence consumer switching behaviour.

5.2.2 Account aggregators

Given that the use of account aggregators in the UK remains limited, it is difficult to draw any conclusions regarding the extent to which these services may eventually impact the market. The extent to which account

¹²³ For full report see: http://webarchive.nationalarchives.gov.uk/20140402142426/http://www.offt.gov.uk/shared_offt/706728/Tool-landing-pages/consumer-protection/pcw-items-banners/PCWs-report.pdf

¹²⁴ Independent Commission on Banking, 2011

¹²⁵ For full report see: <http://www.stickyeyes.com/intelligence/online-consumer-finance-intelligence-report/>

¹²⁶ http://www.paymentscouncil.org.uk/switch_service/

aggregators have the capacity to develop and to disrupt the banking sector in the UK is expected to depend on consumer demand, incentives for financial services firms to allow their customers to share their data held by the financial services firms with third-party aggregators and the regulatory environment.

- **Consumers:** As discussed above, consumers' concerns regarding privacy and security have proved to be a barrier to the emergence of account aggregation services in a number of markets, such as Australia. These concerns may be exacerbated by the fact that many established banks' terms of use mean that consumers are not protected against fraud if their account information is shared with third parties. The move towards greater regulation in this area – with the FCA, the Treasury and the European Commission all supporting a change in policy – has the potential to alleviate these concerns and encourage use of these services.
- **Banks:** some banks in the UK have opposed the entrance of these technology start-ups as they use screen-scraping technology to collect consumers' financial data. The current European Commission proposals under PSD2 may partially address this by requiring banks to share information with licensed third parties, should their customers explicitly consent to this use of their data. The potential for third-parties to enter this space may also encourage banks to extent their own account management offerings.
- **Regulatory environment:** the current uncertainty about the regulation surrounding these services and the extent to which consumers are protected may have reduced incentives for banks and consumers to adopt these services. However the PSD2 proposals from the European Commission and the Treasury's Midata initiative have the potential to increase the use of these services by respectively requiring banks to allow third-parties access to customer information and allowing customers to obtain their own account data in the form of a "digital passport", which can in turn improve the process of opening accounts and enable consumers to manage their finances in one place. The FCA has also commented on the issue of account aggregation and financial awareness in its response paper to the European Commission Green Paper: Building a Capital Markets Union.¹²⁷ The FCA is of the opinion that digitalisation as a whole provides an opportunity to improve the engagement between investors and investment product providers, increase financial awareness, give consumers greater control over their investments, and drive down costs in capital markets.

Should account aggregation services experience significant growth in the UK market, the extent to which they impact competition in the banking sector is likely to depend on whether this market comes to be dominated by leading banks or by third-parties. In the US, it has been third parties that have so far achieved the greatest prominence in the market for aggregation across multiple accounts; examples include Mint, Moven and Simple. However at present the European market is dominated by services provided by banks rather than those provided by third parties. It is unclear whether this pattern will change as the market develops. For example, consumers' concerns regarding security may give banks an advantage in this market. On the other hand, the PSD2 proposals may allow third parties to gain a greater foothold in the market by obliging banks to allow licensed providers access to account data at the customer's request.

If third party services come to dominate the market, this has the potential to increase customer switching by acting as an intermediary between the consumer and their bank, by increasing consumers' financial awareness and awareness of other products and services, and by reducing the informational advantage held by banks. While this may promote customer switching, it could raise other competitive concerns (similar to those raised in regard to price comparison websites in the insurance sector). These concerns include the transparency of the service and the role played by commissions in determining which products and services are recommended to the customer. If, on the other hand, apps and aggregation services provided by banks prove to be more popular with consumers there could be the potential for greater lock-in in this market.

¹²⁷ Financial Conduct Authority, 2015c

Case study 4: Yodlee account aggregation service in the US

Yodlee is an American software company founded in 1999. It provides an account aggregation service that allows users to see their credit card, bank, investment, email, travel reward accounts and other data on one screen. Their account aggregation services cover both individuals and SMEs. In addition, Yodlee provides a web app that helps consumers manage their finances online, providing features such as bill payment, expense tracking, and investment management. As of 2013, Yodlee had over 45 million users, and over 150 financial institutions and portals (including 5 of the top 10 US banks) offer services powered by Yodlee.

Since its inception, Yodlee has changed its business model and increased the range of services offered. In the early stages of Yodlee,¹²⁸ the numbers of consumers grew rapidly, but Yodlee did not bring any direct revenue to the banks, which were also required to pay Yodlee a licence fee. While the banks were not enthused by Yodlee's offering, consumers liked the services and pushed their banks to provide this service. As Yodlee grew, they added a bill payment product (BillPay) and a fund transfer product (FundsTransfer), for which they charged customers, thus resulting in revenues for banks and providing a more sustainable partnership model. Yodlee also partnered with major Internet banking solution providers in order to integrate its own product into their online banking solutions and take advantage of established delivery channels.

Thus, by allowing customers to view all their financial information across institutions on a single platform, Yodlee has improved the information available to consumers about their current products and their relative performance. Additionally, the service has developed to allow financial institutions to draw on this customer information and to better inform the products and services they deliver in meeting their requirements. In this way, Yodlee envisions that banks can develop consumer-focussed digital services, at both a functional and personal level. By engaging more with their clients digitally, Yodlee argues that banks can develop and retain consumer trust and reinforce their brands.¹²⁹

Yodlee has been a commercial success in some respects – it is the dominant market player in the account aggregation market in the US, it had a successful IPO in 2014 and its revenues have increased substantially since its launch in 1999. However, it remains a loss-making business. The core business idea of account aggregation has posed a challenge on account of not providing revenue to banks and financial services providers. The risks of privacy, information security, data breaches, identity theft and fraud remain significant issues, both from a reputation risk and customer perspective.

5.3 Summary

Despite the popularity of price comparison sites across a variety of markets in the UK, their use in connection to PCAs and SME banking appears to be more limited, although there is a lack of recent data in this area. The main barrier cited by entities such as the FCA and the Treasury is the difficulty in drawing meaningful comparisons in the absence of detailed data on the behaviour of the customer. Steps are being taken to address this issue, including ensuring that customers are able to access their own banking data in a form that can then be used by price comparison sites. Although this service is currently only available for individual customers, not business customers, this has the potential to increase consumers' financial awareness and make it easier for consumers to switch between current account providers.

Demand for account aggregator services in the UK also appears to be limited at present, which is generally due to security and privacy concerns from both consumers and banks. In particular, some banks prohibit such services using their information. Furthermore, these services are not currently regulated in the UK, which creates uncertainty from both banks and consumers surrounding their usage. However the European Commission's PSD2 proposals have the potential to address these concerns by mandating that banks share their data at the customer's request, while ensuring that account aggregation services are appropriately licensed. Therefore, the

¹²⁸ For more detail see: <http://web.mit.edu/smadnick/www/wp/2007-05.pdf>

¹²⁹ http://solutions.yodlee.com/rs/yodlee/images/FI_EB_Turn-Retail-Banking-Disruption-Into-Opportunity.pdf

future may see UK banks partnering with third party account aggregators in order to understand their customers better, as in the US and Australia. If such services begin to develop, they have the potential to raise financial awareness and promote switching behaviour as has been seen for price comparison websites. In particular, some account aggregators have the capability to recommend new products that suit the consumer's financial requirements. This suggests that the current distinction between different types of aggregation service may become increasingly blurred.

Aggregators have the potential to provide a more cost-effective channel for new entrants to reach consumers, as consumers no longer need to rely on a well-known brand name when choosing a financial product. This, in conjunction with increased switching, provides an incentive for incumbents to compete for their customers based on price, quality and innovation. Innovation is already being seen in the retail banking market with incumbents such as HSBC and Barclays offering money management tools that aggregate accounts at the incumbent in order to increase the customer's banking experience.

6 Big data

6.1 What is it

6.1.1 Defining big data in banking

The growth of “big data” and its potential for use across a wide range of sectors, including banking, is a topic that has attracted considerable attention in recent years. While the concept remains vaguely defined, the term is broadly used to describe data that is especially large in volume, highly complex or frequently updated to the extent that traditional desktop computers and software, such as spreadsheets, are no longer capable of processing it. Data can include consumer spending patterns and social media activities from third party sources. The growth of digitalisation of activities and processes means there are vast increases in the amount of data being generated, while developments in data storage, management and analytics have the potential to promote greater use of this information.

A distinction should be drawn between the use of internal data and external data, both of which may be “big”. Interviews with market participants indicate that many leading UK banks are currently more focussed on managing and analysing data that they already collect or generate through their business operations rather than on seeking to enhance it with information gathered from external sources. In particular, their responses suggest that more established banks may need to invest additional time and resources in replacing legacy systems to ensure that the data they collect can be stored in one place and different sources can be linked and aggregated.

This investment could potentially place incumbent banks at a disadvantage compared to newer entrants that do not have such legacy issues, particularly as changes to existing systems and processes may have an impact on both regulatory and privacy requirements. On the other hand, the return on this investment for incumbent banks is the advantage of possessing large quantities of historical data, which they can then use to derive valuable insights about their customers or operational activities. Nevertheless, the present focus on addressing these legacy internal data issues by established banks means that the use of external data is limited compared to that of internal data.

There are a number of potential uses for big data within the banking sector.¹³⁰ These include:

- Using detailed customer data to better differentiate (and potentially discriminate) between consumers. This can be used for both customer acquisition and customer retention strategies.
- Making use of data from a wider variety of sources in order to assess potential borrowers and the risks of default associated with loans. This is of particular relevance in the market for SME lending.
- Analysing patterns in large datasets in order to rapidly identify security breaches and predict future violations.
- Making use of centralised information in order to ensure that regulatory reporting requirements are fulfilled while protecting customer privacy.
- Simulating future events and understanding the state of their business, in order to become more capable of managing risk.

Given the wide range of potential uses for big data and the fact that the scope of its use remains opaque, this section focuses on the first two areas: the use of big data in targeting consumer products and as an alternative means of assessing credit-worthiness. These are the two areas where big data has the most immediate potential to affect banks' relationships with their customers, with potential implications for competition.

¹³⁰ SAP, 2014

6.1.2 UK banking developments in big data

Interviews suggest that many of the major banks are still using legacy IT systems and that a lot of data remains isolated across different departments, making it difficult to build a complete picture of customers' behaviour. However, banks in the UK are investing in big data tools that will help them to collect, store, analyse and visualise their data to develop a more comprehensive understanding of their customers. For example, HSBC spent 18 months heading into 2014 testing out big data systems and migrating its legacy data into a new format.¹³¹ At the start of 2015, the bank said that the need to upgrade IT systems to handle big data and protect against cybercrime had pushed up operating costs 6.1%.¹³²

Big data has, in some cases, allowed banks to identify specific products and services to offer to their customers. For example Lloyds and Santander have both offering personalised discounts to customers based on individual spending patterns identified through big data analysis.¹³³

In a similar vein, it is possible for banks to improve their offerings to customers through partnerships with third parties. Barclays offers Group-On-like discounts to its customers based on spending patterns.¹³⁴ Royal Bank of Scotland has also publically discussed its implementation of Microsoft SQL servers to help manage and store its data in a way that increases productivity and can handle increasingly large datasets.¹³⁵

The full extent of banks' investment in this area is not made publicly available. However, interviews with industry participants indicate that there is a spectrum of data maturity across the large banks and that while some banks are still in a relatively early stage of developing their data capabilities, others already have a relatively sophisticated approach. There is also some variety in the focus of the investment. The most innovative applications are thought to be in counter-fraud and regulatory compliance, but there is also some notable use in customer analytics, which allow banks to provide better customer service and to make targeted offers of products and services to existing customers. Interviews did not yield any evidence of the leading banks using big data to assess credit worthiness, however. It is possible that this is out of choice as incumbent banks may choose to simply hold the vast amount of historical data on transactions or behaviour rather than applying complex algorithms. Lending to SMEs, which is heavily concentrated in the largest four UK banks (they currently hold an 85% combined share in the market for outstanding general purpose business loans (including commercial mortgages),¹³⁶ is currently still generally based on traditional credit assessment checks.¹³⁷

As well as using it for their own purposes, the importance and depth of banks' data has made it an asset that they can sell to others. Barclays announced in 2013 that it would start selling its anonymised customer spending data to third parties.¹³⁸ Such data markets are long established and aggregators, such as Experian, have been selling their consumer information to other institutions for over a decade.

Data protection regulations also constrain what banks can do with customer data. A key development that is likely to affect bank use is the European Commission's General Data Protection Regulation, which is expected to be agreed on and implemented by the end of 2015.¹³⁹ At a high level, the proposed regulation will require that banks do not use the data they have collected on customers for any purposes other than those for which they were initially collected, without the explicit consent of the customer. For example, banks would have to acquire the consent of their current account customers before they used their current account data for the marketing of

¹³¹ The Banker, 2014

¹³² HSBC, 2015

¹³³ Financial Times, 2015c

¹³⁴ <https://www.bespokeoffers.co.uk/>

¹³⁵ Computing, 2014

¹³⁶ Competition and Markets Authority, 2015

¹³⁷ Interviews with market participants

¹³⁸ This is Money, 2013

¹³⁹ European Commission, 2012

other products or even for the purpose of credit scoring. In theory customers who would benefit from this use of data would provide consent. However, primary research by Deloitte on consumer attitudes in the UK, France and Germany indicates that the vast majority of customers would refuse consent, even though other answers suggested they value service provision as more important than having control of their data (for example 78% of consumers said having access to web content is at least as important as being in control of how their data is used).¹⁴⁰ While there may be differences between what people report in surveys and how they act in practice, this evidence suggests a potential reduction in the availability of some customer data under the current proposals. In its current form, this regulatory shift therefore has the potential to significantly limit the development of big data use in the UK and the EU. If many customers refuse consent then the gains to be made from the relatively small base of customers who do provide consent may not be sufficient to incentivise further innovation in this area.

6.1.3 Global developments on big data and lending

Worldwide, big data appears to be primarily used by banks in marketing and digital security. The stated goals in connection with big data adoption by banks are reported to be cost reduction by cheaply storing new data, time reductions by consolidating complicated datasets, offering new big data-based products, and supporting internal business decisions.¹⁴¹ For example Kabbage, an SME lender with operations in both the UK and US, applies big data analysis techniques to data from both social media pages and online market places (for example, eBay) to determine the credit score of a small business.¹⁴²

The following are some examples of big data used by international banks:

- US banks are investing in big data to understand how customers are engaging with different channels such as in-branch or online.¹⁴³
- Banks in Canada such as the Bank of Nova Scotia have begun using real time-data to improve their risk management processes.¹⁴⁴
- Major Australian banks such as National Australia Bank, Westpac and ANZ have begun to use big data to tailor their product for different customer segments.¹⁴⁵
- Alior Bank in Poland has put together a substantial database on customers and their payments in the country. The bank has stated that it wants to combine online browsing data with information from social media sites and T-Mobile Poland in order to sell and price products.^{146 147 148}
- A SAS survey on Nordic companies finds that big data is primarily seen as useful for customer and market intelligence and that only 5% of the companies surveyed across Denmark, Finland, Norway and Sweden had already adopted big data technology.¹⁴⁹

Similar to the UK case, major banks globally do not generally appear to be using big data to assess the credit worthiness of their customers. However, non-banks are making the biggest impact in this area and the US is a clear leader in the availability of these services. However, aggregated data on the volume of big data in loans has not been sufficiently investigated to date and information on the market is fairly limited.

¹⁴⁰ Deloitte, 2014b

¹⁴¹ Davenport, 2013

¹⁴² Financial Times, 2013b

¹⁴³ Davenport, 2013

¹⁴⁴ Toronto Financial Services Alliance, 2013

¹⁴⁵ Australia Business Review, 2015

¹⁴⁶ Industry participant discussion

¹⁴⁷ Alior Bank, 2013

¹⁴⁸ Niebezpiecznik, 2013

¹⁴⁹ SAS, 2015

Non-bank firms in the US have been the earliest adopters of big data for credit assessment of SMEs.

- The US has recently seen an increase in FinTech start-ups. Companies such as Kabbage (discussed further in Case study 6), LendingClub and ZestFinance are building their business on credit assessments that depend on big data. The US players have been using credit assessments in a number of areas: they act as lenders, peer-to-peer platforms and lending intermediaries.
- Entrance into the UK market entry from some of the US players is relatively slow. Kabbage, launched in the US in 2009 and started offering its loans to British SMEs in February 2013, however few others have followed suit. Kabbage requests access to its customer's eBay and PayPal accounts to acquire real-time data, combining this with personal information knowingly disclosed to Kabbage by customers or from third parties (e.g. credit reference agencies).¹⁵⁰ Comparatively, Capital Access Network integrates data from firm-specific, banking and credit card processing sources with proprietary risk models built from transactions over multiple business cycles.¹⁵¹

Table 7: Types of new lending organisations utilising big data

Type	Activity	Examples of companies
Lenders	A number of new FinTech companies have developed their own credit scoring systems in order to issue loans to small businesses and consumers.	Kabbage, ZestFinance, Capital Access Network, Lendup
Peer-to-peer	Peer-to-peer lending has also seen dramatic growth with the rise of online financing. New entrants in this space are using big data to create credit scores that reduce the risk that lenders face when providing financing to others.	Lending Club, Prosper
Intermediaries	Algorithmic assessment of borrowers is also enabling innovative companies to assess borrowers on behalf of financial institutions and venture capital funds. By providing comprehensive assessment of credit worthiness, loan intermediaries help increase the probability of loan repayment.	Biz2Credit, Fundera, Lendio, Raiseworks

Source: Deloitte analysis

Other companies are using big data to expedite the process of consumer lending or to improve their offering to personal current account customers. Using the large amount of information available online, online lenders are now able to consider factors such as e-commerce sales history, online shopping information and social media activity as part of their loan acceptance process. For instance:

- Wonga, which started in the UK, has been able to use algorithmic credit scoring to supply payday loans to consumers in five countries;¹⁵²
- Germany based Kreditech has been successful in the consumer lending industry through algorithmic credit score assessments. The company primarily focuses on emerging markets with operations in Poland, Spain, Czech Republic, Russia and Mexico,¹⁵³

¹⁵⁰ <https://uk.kabbage.com/company/privacy/>

¹⁵¹ <https://www.cancapital.com/>

¹⁵² <http://about.wonga.com/>

- One study finds that algorithmic techniques used in consumer credit assessment may provide cost savings between 6% and 25% of total loss as incurred through consumer credit risk;¹⁵⁴
- American Express has adopted big data platforms in order to analyse social media interactions with clients, engage in dynamic pricing and improve profitability.¹⁵⁵

The extent to which banks develop their big data capability may be limited by the risks and expense involved in transitioning to new technology. Middleware¹⁵⁶ gives banks the option of integrating new capabilities without complete replacement of legacy systems, thus presenting less of a risk. For instance, Oracle's Fusion Middleware Solutions allow for the use of big data, something that did not exist when legacy bank systems were built.¹⁵⁷ This type of functionality could be applied in the credit scoring of SMEs where standard data capabilities are inappropriate.

¹⁵³ TechCrunch, 2014a

¹⁵⁴ Khandani, 2010

¹⁵⁵ EnterpriseTech, 2014

¹⁵⁶ Middleware is a software that acts as a bridge between an operating system or database and applications, especially on a network.

¹⁵⁷ <https://www.oracle.com/middleware/index.html>

Case study 5: Alibaba's Sesame Credit finds new ways to assess potential borrowers

SME lending in emerging markets has historically experienced very low rates of traditional credit provision, due primarily to the lack of data on consumers' credit histories. However, a key challenge remains in the collection of such data. One approach used in overcoming such data issues has been the use of online consumer data to determine creditworthiness.¹⁵⁸ An example of this is the Chinese e-commerce company, Alibaba, which recently launched a private credit-scoring business called Sesame Credit.

By harnessing the data captured from Alibaba's online consumer business, Sesame is able to assess consumer spending activity in order to accommodate the fact that many Chinese customers lack traditional credit history.¹⁵⁹ The service is explicitly intended to help consumers and SMEs that lack history with credit agencies and the collateral required to borrow through established channels.¹⁶⁰

"Sesame Credit is focused on those who may have little credit history at traditional credit agencies. They may have never obtained bank loans or applied for credit cards. However, they might be active Internet users who shop online a lot, e-pay their utility bills on time, have a stable residential status and have been using their mobile phone numbers for a long time." Yu Wujie, chief data scientist at Sesame Credit.¹⁶¹

Alibaba presents a potential growth path for US companies such as Amazon and eBay. The company began as a service to help small Chinese exporters but has now developed into a global leader in online money transfers and mobile commerce in addition to its new SME lending venture.¹⁶² Already, companies such as Amazon and PayPal have begun to expand into the provision of finance for SMEs.

However, issues in addressing data gaps across markets still remain. Such data gaps may be a result of market or policy failures, or of technical limitations. In accessing and assessing potential new borrowers, credit providers thus need to adapt their business models to acquire non-financial data, whilst developing and retaining strong privacy and data practices.¹⁶³

¹⁵⁸ SME Finance Forum, 2015

¹⁶⁰ Jewish Business News, 2015

¹⁶¹ Financial Times, 2015b

¹⁶² Alibaba Group, 2014

¹⁶³ SME Finance Forum, 2015

Case study 6: Kabbage providing credit to small businesses through algorithmic credit scoring

Kabbage is one of the largest new online companies offering credit to small businesses, and provides an example of how non-traditional online lenders are displacing more traditional forms of SME lending in the market.

Launched in 2009, the US-based company uses data from various sources to assess creditworthiness including customer's business checking accounts, eBay store account, PayPal account, UPS shipping data, transaction volumes and feedback from social media.¹⁶⁴ For example, Kabbage has partnered with UPS in order to share shipping data and understand the volume of transactions and orders placed.

Kabbage has stated that it lent out more than \$750 million to small businesses since its foundation in 2009; it expects to loan \$1 billion during 2015.¹⁶⁵ The company expanded into the UK in the beginning of 2013.

"Banks have always found it hard to profitably provide loans of less than \$100,000 due to the highly manual nature of their lending process. They often require personal guarantees, and business owners are afraid to put their house on the line. Most banks can't lend to business owners with a FICO score less than 700, but these borrowers are just as creditworthy - many of them are simply using personal credit to run their business, which artificially deflates their score. We supplement that data with our own collection of data to make credit decisions." Kathryn Petralia, Kabbage co-founder and COO.¹⁶⁶

The emergence of online platforms for credit scoring, such as Kabbage, has been driven by the ease, speed and transparency in accessing credit that such services offer to consumers with limited traditional credit histories. Non-traditional lenders are thus presenting an increasing risk of disintermediation to banks¹⁶⁷ As such, Kabbage expects that banks will most likely collaborate with non-traditional lenders in the future. In this way, banks could capture the benefits of some of the online innovations in the market.¹⁶⁸

6.1.4 Drivers and barriers to big data usage in lending

Interviews with international industry participants have indicated that the use of big data in banking may be limited by challenges the incumbent banks face in adopting the new technology. Recent consolidation in the banking sector and increasing regulatory pressures mean that the industry is made up of large, disjointed organisations that could struggle with managing their customer information sets. Even in established banks that have not experienced any such consolidation, the functions of a bank were often isolated from one another making it challenging for a bank to condense an individual's current account, mortgage, insurance and savings information into a single profile.^{169 170} However, interviews suggest banks are now investing heavily in data management to allow them to use the data they hold more effectively.

Fragmentation of banks across geographic boundaries may also make it difficult to create centralised databases. While large banks operate across a number of countries, regulation and internal risk management procedures often block the sharing of information across international lines. For example within the EU, regulation on personal data protection may prevent personal data from being transferred outside of the EU.¹⁷¹ Recent EU

¹⁶⁴ American Banker, 2012

¹⁶⁵ TechCrunch, 2014b ; The Wall Street Journal, 2014

¹⁶⁶ Kreditech, 2014

¹⁶⁷ Financial Times, 2014

¹⁶⁸ Kreditech, 2014

¹⁶⁹ Fink, 2015

¹⁷⁰ Gigaom Research, 2014

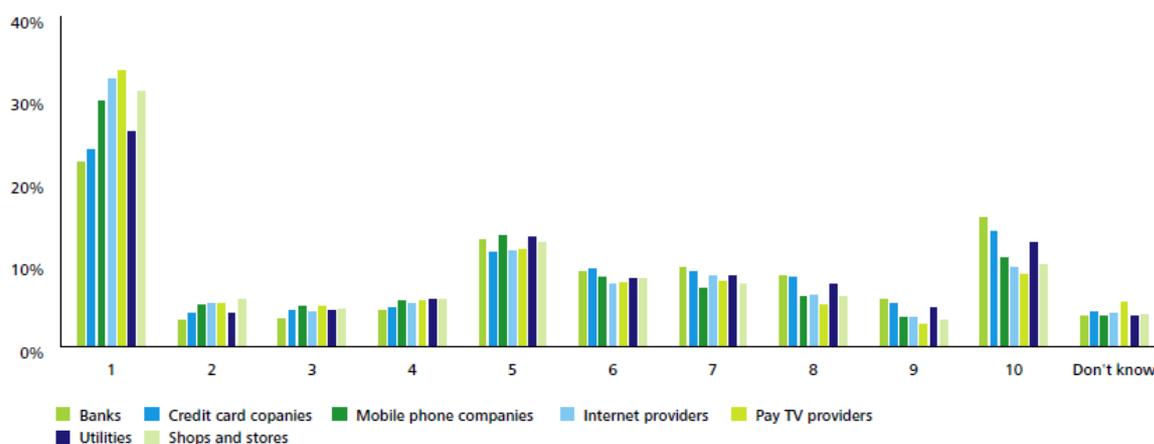
¹⁷¹ European Commission, 2015

regulation includes compliance rules that could fine companies that violate data protection policy up to 2% of their global turnover.¹⁷² Data-sharing even within individual banking groups could be limited by this kind of regulation; however international banks with a large set of information may have the potential to gain a competitive edge if they were to share data and insights on customer behaviour across borders.

Even if banks are able to work through barriers on the supply side, there may still be issues in gathering the data for analysis. As any non-cash transaction can be considered a data-point, banks could potentially have to handle massive amounts of data. This could pose practical challenges in the analysis of customer data.

In some cases the scope and quality of the data that is available is dependent on consumer attitudes. This can influence the extent to which banks are able to use this data in assessing credit-worthiness, for example through limiting banks or credit-scoring companies access to third party data. Evidence indicates that consumers are generally less willing to have information from phone, Internet and TV providers and data from shops and stores reflected in their credit history, as illustrated in Figure 28.

Figure 28: Consumers' level of comfort with companies sharing credit information with credit rating agencies (1=highly unwilling, 10=willing)



Source: Deloitte, "Economic Impact Assessment of the proposed European General Data Protection Regulation"

Turning specifically to the application to SME credit scoring, the use of innovative technologies in connection to big data has greater potential in markets in which SMEs are less able to access credit through traditional channels. This may include markets with large numbers of microbusinesses and younger SMEs.

¹⁷² European Council, 2015

Case study 7: Using unconventional data to make micro-loans in Kenya

Safaricom, the leading mobile operator in Kenya, has leveraged its mobile data in order to provide micro-loans to its customers. Instead of relying on standard measures of creditworthiness, the company assesses customers through an examination of the spending patterns of its users via airtime top-ups and M-Pesa mobile money transfers.^{173 174}

The reliance on mobile data reflects the fact that other information is less available in Kenya than in developed economies. Kenya is characterised by low Internet availability but high levels of mobile activity - in 2013 the country's Internet penetration and mobile penetration was 39% and 72% respectively.¹⁷⁵ These market characteristics make it difficult for potential lenders to use some of the big data techniques that rely on online data but create a unique opportunity in mobile.

The Kenyan case illustrates that potential lenders are not limited to certain sets of data when considering market entry. As long as a new player has access to some form of data that adequately assesses consumers and businesses, it may have an opportunity. What this implies for developed economies is that any company with significant data access may be in a strong position to assess, or provide data for others to assess creditworthiness.

6.2 How big data impacts the market

The challenges faced by banks and the recent developments in the market suggest some important implications for long run competition in the SME lending space.

6.2.1 Big Data can improve SMEs' access to credit

The new technology may be leading to higher approval rates for small businesses, allowing more companies to grow by taking on credit. Alternative lenders, which include those operating online only, have a significantly higher approval rating than the big banks that are still lending the biggest share of credit to SMEs. A UK Government consultation outcome on SME finance notes that the rejection rate for first time SME borrowers is around 50%. This high figure is likely due to viable borrowers who simply do not meet the risk profiles of the largest banks.¹⁷⁶

Figure 29 shows a comparison of approval rates by type of lenders in the US, the higher approval rate of applications to alternative lenders may reflect a greater willingness on the part of the lender to take on risk, but equally it may also reflect an increasing understanding of customer risk that makes it easier to issue loans. In the US, for example, there is evidence that small businesses are more likely to have loans approved by alternative lenders, such as online lending services, than by traditional banking institutions.

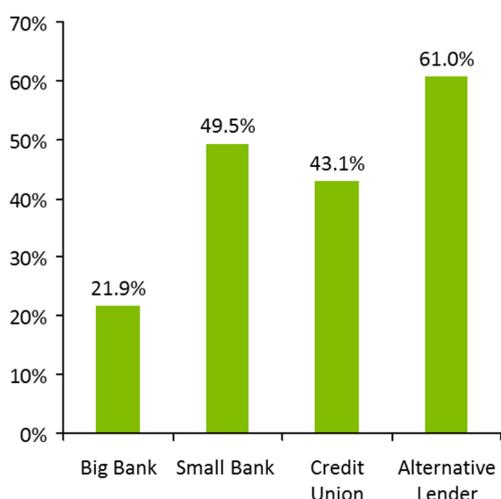
¹⁷³ Business Daily, 2012

¹⁷⁴ Business Daily, 2015

¹⁷⁵ World Bank, 2015

¹⁷⁶ Treasury, 2014

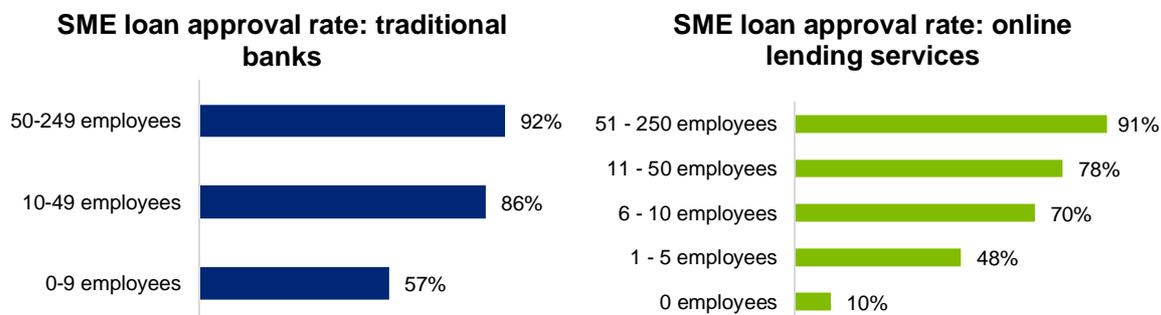
Figure 29: Approval rates for small business in the US, by lender types, May 2015



Source: Biz2Credit Small Business Lending Index

Within the UK, evidence on the impact of big data on credit availability is more limited. In particular, there is no clear evidence that SMEs applying for credit from the online banks and institutions that are making use of alternative data enjoy a higher success rate. It should be noted that the UK is already ahead of many other European markets in terms of SMEs' use of alternative lending facilities and therefore the role of new innovations going forward may be more limited.¹⁷⁷ Figure 30 shows that the approval rate for the largest SMEs from both traditional banks and online lending services differ by only one percentage point, whilst the approval rate is actually lower for the smaller SMEs making applications to online lending services.

Figure 30: SME loan approval rates (UK, 2014)



Source: Baeck, Collins, & Zhang, 2014; BDRC Continental, 2015

However, this data does not account for differences in the types of firms applying through traditional and non-traditional channels. Moreover, it does not reflect the fact that a significant share of SMEs applying for online loans may have already been refused credit through other channels. Evidence from a survey of SMEs indicates that the inability to obtain other sources of funding was an important factor for 65% of applicants for online loans.¹⁷⁸ Flexibility, transparency and greater control over lending and repayment were also cited as important factors by a majority of applicants.

¹⁷⁷ For example, there were about €2.3 billion in alternative finance transactions in the UK in 2014, compared to €8.2 million in Italy and €140 million in Germany. Ernst & Young and University of Cambridge research, 2015; Baeck, Collins, & Zhang, 2014

¹⁷⁸ Baeck, Collins, & Zhang, 2014

The increased availability of data combined with changes in the regulatory environment could enable further growth in alternative lending services. The 2015 Small Business, Enterprise and Employment Act includes provisions to improve access to SME credit data by requiring banks to pass on data on SMEs rejected for loans to alternative providers (at the applicant's request).¹⁷⁹ Already, Santander and RBS are partnering with the peer-to-peer lenders Funding Circle and Assetz Capital to share the details of SMEs whose loan applications were denied. At present, such lenders contribute about 1% of lending to SMEs, but this market is estimated to be growing at 200% per year.¹⁸⁰ However, to the extent that this market remains focussed around SME customers refused credit from established banks, it is unclear whether such schemes will have a significant disruptive impact on the activities of leading banks.

A key issue affecting the potential for the application of big data to credit scoring is the quantity and quality of data on SMEs. This is likely to be significantly lower than data on consumers, as consumers typically generate more internal data (e.g. transactions) and external data (e.g. social media interaction). Interviews with one industry participant suggest that, for this reason, it may be more challenging to use new credit scoring methods for SMEs than for consumers and that external data would be especially valuable in the case of SME credit scoring. For example, companies that collect e-commerce data, such as PayPal, Amazon and Alipay, have been able to leverage this to support credit products for SMEs.

6.2.2 Customer switching

On the consumer side, evidence on the impact on the market is more limited. As discussed above, one way banks use big data in connection to consumer banking is to integrate their own internal systems and to take steps to match customer data from different sources. Interviews with industry participants indicate that the key purposes of this process are to be able to offer tailored products, identify "next best steps" in response to customer queries and to improve retention.

Given the confidentiality surrounding these programmes and the fact that many are still in their infancy it is not possible to identify the potential effects that such uses of big data may be having on customer switching in the market. However, as many of the banks are focussed on improving customer retention and selling additional services there may be some potential for lock-in and a reduction in churn between the leading banks.

In the longer term, big data may potentially have a greater impact in this market. As discussed in Section 7, companies are beginning to make use of detailed consumer data in price comparison services in order to identify the best offers available, based on spending history. The UK Treasury is also supporting the further development of these services by encouraging banks to develop APIs that would allow third parties to access consumer data in order to provide consumers with a better overview of their financial activities. Similarly, most high street banks now allow customers to investigate their spending habits by providing detailed breakdowns by category and over time. These developments could in turn lead to increases in consumers' financial awareness.

6.2.3 Impact on barriers to entry

In addition to the direct impacts on SME lending and customer switching, an increase in the importance of big data and analytics has the potential to change the landscape of the banking sector in the longer term.

As discussed in Section 4.1.4, the high costs of updating legacy systems and transferring information may weaken the ability of many banks to fully take advantage of big data solutions. In general, incumbent banks have client data spread out across their various departments, offices and IT systems and being able to bring it all together into a consolidated resource can represent a significant financial cost. One bank representative has stated that being able to get large amounts of data from older legacy systems moved over to newer ones is a particularly difficult challenge. The issues with the transition arise from data with varying structures and high levels of overlap; in some cases these older systems have been built up over several decades making them particularly complex.¹⁸¹ The issue of legacy systems is not confined to the banking industry; the HMRC, which

¹⁷⁹ Department for Business, Innovation & Skills, 2015a

¹⁸⁰ Financial Times, 2015d; RBS, 2015

¹⁸¹ Computerworld UK, 2013

has been interested in applying big data to fight tax avoidance and detect fraud, has also found migrating information from old systems a challenge to new analysis.¹⁸²

New entrants may therefore have an advantage in setting up new technologies as they are not faced with the burden of maintaining and updating legacy systems. CapitalOne, for example, is a fairly young bank that focused on developing a strong digital strategy.¹⁸³ The bank has been able to build a strong online brand through its purchase of ING Direct, which has been rebranded to CapitalOne 360. As a late entrant, the company has been able to ensure that data collection and analytics practices have remained streamlined in order to be analysed. The figure below shows the estimated differential in costs between banks running on third party banking applications relative to those using legacy systems.

In addition, some of the older challenger banks (e.g. Tesco Bank) were launched as joint ventures with the larger incumbents; Tesco Bank launched as a joint venture with RBS. Therefore, Tesco initially used RBS's banking platform.¹⁸⁴ When Tesco bought RBS's share of the venture in 2008, it did so with the intention of becoming a 'full-service' bank and used Fiserv's core technology platform. Therefore Tesco was able to enter the market for personal current accounts with an already established customer base and a more up-to-date technology.

Figure 31 shows the improvement in performance over five years of banks running on third party systems versus those using legacy applications. The return on assets is higher by 19% while the return on capital is higher by 28%. In addition, the cost to income ratio fell by 6.5%.

Figure 31: Improvement in performance over five years of banks running on third party systems versus those using legacy applications



Source: Deloitte analysis on Temenos, 2014

This is a view supported by the FCA, which has argued that "This is one area in which new businesses have an advantage over existing firms, as they do not have the legacy of old and fragmented IT systems, but have the opportunity to design systems that closely align with their business model and use newer and often cheaper technology. However, it is important to note that this advantage may not be sufficient for new entrants to compete with existing firms equally, due to the latter having better contract terms and more established relationships."¹⁸⁵

Big data and analytics may also contribute to further potential market advantages for new entrants. New entrants that are able to create a competitive advantage in data collection and management may pose a threat to major banks' SME lending business. If new entrants block or limit bank access to data through intermediary offerings,

¹⁸² Computerworld UK, 2013

¹⁸³ Information Week, 2014

¹⁸⁴ <http://corporate.tescobank.com/19/about-us/our-story>

¹⁸⁵ Financial Conduct Authority, 2014a

banks may be less able to compete in credit assessment. However, the extent to which this is a threat depends on the quality of data acquired by new entrants and the way in which it is applied.

Non-banks with significant access to data that can augment banking data may also have an advantage if they seek to enter this market. There is precedent for other companies to enter into this space if they can leverage their own data to help assess credit-worthiness. Companies such as Google, Facebook or Twitter already possess enormous datasets on their users and may have the ability to leverage this information in order to assess credit worthiness. Examples include:

- Google entering the market for car Insurance comparisons;¹⁸⁶
- PayPal Working Capital using a business's sales data on PayPal to make its own credit assessment;
- Amazon Capital Services similarly uses the data that businesses have available on the e-commerce site to determine creditworthiness.

6.3 Summary

Big Data is being used for a range of purposes in the banking sector. Potential uses include improving credit scoring making targeted, personalised offers, improving customer retention, and the use of data to monitor security and compliance. This section focussed on the former two uses and the impact on customers and firms. In addition to these uses by financial services providers, consumers benefit from the use of big data through aggregation services such as price comparison sites and money management tools; these services were discussed in Section 5.

Evidence from interviews with market participants indicate that leading banks' activities in this area have tended to focus on the consolidation and codification of their own internal data in order to make the most of the information available in order to improve their offering to customers. With many of these programmes still in progress, it is difficult to identify whether this has had an impact on customer retention and churn in the market.

In the SME lending market, the evidence suggests that big data may have a more direct impact through the emergence of a range of services offering credit to firms that may not have conventional credit histories. For example, lenders may take into account detailed transaction data, social media activity and reviews and shipping data in order to assess credit-worthiness. However, given that the UK SME lending market is relatively diverse compared to other countries it is unclear whether this will have a significant impact on the market.

Although evidence on the direct impact of big data on customers is limited, it may nonetheless have a significant impact on the longer-term development of the market. In particular, new entrants and non-conventional market players may have a competitive advantage in this area since they are not constrained by legacy IT systems. Moreover, companies such as Amazon and PayPal that are beginning to enter the lending market enjoy an advantage in accessing alternative sources of information. In the longer term, by reducing the competitive advantage that banks currently enjoy due to their access to proprietary information, this may increase disintermediation in the market.

¹⁸⁶ <https://www.google.co.uk/compare/>

7 Bank in a Box

7.1 What it is

7.1.1 Defining Bank in a Box

The meaning of the Bank in a Box (BiaB) concept has evolved over time in the UK. Historically, BiaB referred to licensed application software providing deposit taking and lending functionality (often including current accounts) through non-digital channels, covering front and back office functions. A banking institution would have to implement such software itself. In the context of the UK banking sector, customers for such solutions historically included branches of international banks in the UK and branches of UK banks overseas, whereas most larger UK banking institutions had built their own banking platforms.. However, today BiaB is typically understood more broadly as a “one-stop shop” service, whereby a new entrant or existing institution can obtain a complete solution for the IT systems it needs to operate a banking business.

BiaB services may differ from provider to provider, but broadly they include:

- a core banking solution providing a range of banking products;
- support for face to face and digital different delivery channels;
- debit and credit card processing;
- Know Your Customer (KYC) / Anti Money Laundering (AML) services;
- credit processing;
- fraud and risk analytics; and
- financial, management and regulatory reporting.

BiaB services can be categorised into two types. With a “hosted solution”, a provider hosts dedicated systems for a banking institution. Hosted solutions commonly involve long-term relationships between provider and bank, and payments are based on the capacity provided (in other words, not just the capacity used), typically on an annual basis. A more recent model is known as a “cloud-based solution.” Under this model a provider allocates capacity according to each user’s needs. Capacity is flexible and users are charged on a monthly basis according to volume metrics (such as the number of transactions or the number of accounts). As cloud-based solutions offer lower start up costs, they are typically preferable for smaller entrants.

BiaB services are typically provided by specialist technology providers (e.g. FIS, Oracle), but some banks also provide white label solutions. For example in Canada, President’s Choice Financial is a banking service provided by the supermarket Loblaw, using a hosted solution provided by CIBC.¹⁸⁷ In the UK, HSBC provides the banking services for Marks & Spencer in the form of M&S Bank.¹⁸⁸

Users of BiaB are typically new entrants and small banks rather than larger incumbents. For example, Hampden & Co, a new UK private bank which launched in the UK in June 2015,¹⁸⁹ uses cloud-based services provided by Oracle, while Sainsbury’s is in the process of outsourcing its banking operations to FIS.

¹⁸⁷ <http://www.pcfincancial.ca/>

¹⁸⁸ M&S Bank is run as a joint venture between HSBC and Marks & Spencer. However, it is wholly owned by HSBC. See: <http://bank.marksandspencer.com/explore/about-us/overview/> ; Financial Times, 2012

¹⁸⁹ Oracle, 2015; Financial Times, 2015e

BiaB provides a number of advantages to users:

- **Reducing costs of entry:** BiaB providers plan to serve multiple banks on a shared set of platforms and charge each according to a volume metric such as the number of transactions or the number of accounts. While there may be an initial fee for setting up the service, BiaB allows new entrants to avoid many of the set-up costs involved with setting up a bank. For example, the CEO of Lintel Bank, which is currently in the application process for authorisation from the PRA and FCA, estimated that the bank would have its infrastructure set up at a cost of less than £10m;¹⁹⁰
- **Reducing time to market:** By adopting preconfigured systems instead of developing their own, BiaB users can reduce the time it takes to enter the market. These times vary according to the complexity of the offering, but according to one industry participant launch can be completed within a year of receiving authorisation;
- **Reducing uncertainty:** BiaB provides a stable platform with ongoing upgrades. As the service is known to regulators, bank authorisation requests are likely to be more straightforward than requests based on unknown or unproven platforms. As a result there is likely to be more certainty around bank launch.

These advantages suggest potential for lowering barriers to entry in the retail banking market. However, establishing the extent to which this matters requires some key questions to be addressed, including:

- What potential is there for BiaB solutions to lead to significant entry and what sort of entry is there likely to be?
- To what extent does using BiaB constrain product differentiation and business growth?

7.1.2 International development of Bank in a Box

Interviews with industry participants highlight some differences in the development of BiaB offerings across international markets. Some of the more mature markets are the US, Germany and the Nordics while the UK market is still developing. Table 8 describes the deployment of BiaB services in these markets and provides details on the types of users.

Table 8: BiaB provision in a range of markets

Market	Selected BiaB providers	BiaB users
North America	D+H, FIS, Jack Henry	Several thousand local banks and credit union
Nordics	BEC, EVRY, Samlink, SDC, Swedbank	Several hundred small banks
Germany and Austria	Fiducia GAD, Finanz Informatik	Over one thousand local, regional and savings banks
Australia	Rubik	Australian building societies
UK	FIS, Fiserv, Oracle	Hampden & Co., with several new entrants to be launched on BiaB platforms

Source: Deloitte analysis based on interviews with market participants and company websites

In addition to the number and types of banks that use BiaB services, interviews with industry participants suggest there are also differences in the level of customisability of BiaB services across the different markets. In the UK,

¹⁹⁰ Computer Weekly, 2015

users can typically configure the customer facing elements but they are not able to select individual components. While there may be a greater capacity for larger customers to pick and choose the components they want, smaller clients are generally constrained to taking the full stack if they wish to use the service. However, in more developed markets these constraints appear to be less restrictive and smaller market players are able to pick and choose the various elements to a greater extent.

Interviews with some industry participants suggest that as the market develops, there are likely to be incentives for service providers to offer more flexible arrangements to accommodate the broader range of business models and offerings. These developments may in part be driven by the growth of other innovations, such as the growing application of big data to financial services by both banks and non-banks, and also by the desire for service providers to extend their offerings to increase revenue. For example, the potential development of new business models that use social media to carry out KYC processes may generate new opportunities for BiaB providers.

In order to fully serve the entire market, providers would have to adapt their offering and move to a model in which clients can select which parts of the bank they want in the box and which they want to provide themselves.

Case study 8: Bank in a Box in Nordic markets

The Nordic markets are considered to be one of the most mature markets for BiaB worldwide, originally evolving from partnerships between savings banks in the 1960s. According to a local industry participant, there are currently over 300 banks in the Nordic countries operating on BiaB platforms provided by BEC, EVRY, Samlink, SDC, Swedbank and other providers, and it is the norm for Tier 2 and Tier 3 banks.

Across the region the combined market share of players using BiaB solutions varies and is estimated to be up to 42% in Denmark, with individual market shares as high as 9% of deposits for the market leader, Jyske Bank.¹⁹¹

Country	Banks that use BiaB	Combined share of deposits of Biab users	Largest Biab user (market share in deposits)
Denmark	All banks (over 100) except Nordea and Danske Bank	42%	Jyske Bank (9%) ¹⁹²
Norway	All banks except Nordea, DNB and Danske Bank	44%	Handelsbanken Bank (3%) ¹⁹³
Finland	All but the largest four banks	23%	Savings Banks Group (4%) ¹⁹⁴
Sweden	Two banks run on SDC, while 80 small savings banks run on an internal BiaB solution offered by Swedbank	Low	Skandiabanken (<1%) ¹⁹⁵

Source: Deloitte analysis based on interviews with market participants, bank annual reports and central bank statistics

Banks that use BiaB are typically small and offer non-complex banking services focussing primarily on savings and loans. The largest bank in the region to operate using BiaB services is Jyske Bank. The bank is the third largest bank in Denmark and provides financial services to both private customers and companies.

In Sweden, the main BiaB based bank, Skandiabanken, is an Internet-only bank with one branch in Stockholm, primarily serving individuals with a variety of deposit and lending products, including mortgages.

The biggest BiaB based financial institution in Finland is the Finnish Savings Banks Group. It comprises regional savings banks, each operating as an independent legal entity, and the Central Bank of Savings Banks Finland Ltd (CBSBF). The CBSBF is required to ensure the liquidity and fund-raising of the Savings Bank Group, operating in capital markets and managing settlements on behalf of the group.¹⁹⁶ The group serves both retail and business customers.

¹⁹¹ Danmarks Nationalbank, 2014

¹⁹² Danmarks Nationalbank, 2014

¹⁹³ Finans Norge, 2013

¹⁹⁴ Federation of Finnish Financial Services, 2014

¹⁹⁵ Swedbank, 2015

¹⁹⁶ <http://www.saastopankki.fi/etusivu>

7.2 How Bank in a Box technology impacts the market

7.2.1 Market entry

The key channel by which BiaB impacts the retail banking market is by reducing barriers to entry. As it allows banks to avoid many of the large sunk costs associated with setting up, new entrants can enter the market quickly and operate at a relatively small scale.

The opportunity for banks to operate at a small scale can be particularly useful when the costs of acquiring customers is high, as it allows entrants to gradually increase their market share and reduces the need to pursue aggressive pricing strategies to win customers quickly. It also provides an environment that supports entry by players with innovative approaches and those operating in niche segments.

For example, Finland's online-only bank Holvi entered the market for SME banking in 2011 targeting small businesses and entrepreneurs. Holvi's aim was to simplify banking services for sole traders, for which current banking systems were not well suited and often resulted in lost revenues and business due to the length of time and administration required to open a bank account.¹⁹⁷ Instead of building its own banking infrastructure, Holvi focussed on building the customer interface and used partnerships for other functions. The transaction banking infrastructure and the APIs¹⁹⁸ required to connect the front end with what the customer sees are provided by Nordea, while GB Group, an identity intelligence specialist, provides document verification services to support the boarding process. As a result, sole-traders and small SMEs can open an account with Holvi in under a minute without having to go to a branch with documents. This feature is central to how Holvi positions itself in the market, whilst online services are also integral to saving customer time, thus allowing the SME's to grow their businesses.

In the UK, a number of challenger banks are looking to services specific niche segments. For example, Lintel bank plans to use a pre-configured core banking system from a third party provider to target overseas students and new migrants to the UK. Lintel is still awaiting authorisation from the PRA and FCA, though on launch it is planning on offering services that range from personal current accounts to loans for SMEs. German digital bank Fidor is also planning a UK launch. Fidor targets digitally-sophisticated customers (both private and business) through a range of services, with a focus on social media users and online only businesses. The bank will include a community site, where users and representatives are able to discuss the financial services offered by the bank, and in Germany it already has a reputation for approving loans in minutes.

The reduction in time to market and the uncertainty of entering a market facilitated by BiaB also lowers barriers to entry. BiaB allows challenger banks to respond to advantageous market conditions and it reduces the length of time in which banks have to incur costs without generating revenues. Interviews with some industry participants highlight this as a key advantage of BiaB. As the UK BiaB market develops further, time to market is likely to become shorter in the UK. For example, according to one industry participant, Newcastle Building Society Solutions, a private savings account provider, can offer new savings account services to a new client within a timescale of approximately six months.

These services may have further potential to impact the market if they are used by banks that are able to differentiate themselves and make themselves particularly attractive to consumers. Bank in a Box may make it easier for trusted brands to enter the market, for instance a supermarket as a non-regulated business with a regulated banking arm. The two notable examples of this, Tesco Bank and Sainsbury's Bank, operate only in personal retail banking and take advantage of their well-established customer bases as grocers.

- Tesco Bank now operates in the personal banking market targeting its supermarket loyalty card customers. As mentioned in section 6, Tesco started the bank as a joint venture with RBS but was able to buy out RBS's share of the business and migrate to Fiserv's core technology platform in 2009.¹⁹⁹ Since migration to its own

¹⁹⁷ GBG Group, 2015

¹⁹⁸ Application Program Interface

¹⁹⁹ <http://corporate.tescobank.com/19/about-us/our-story>

platforms, Tesco Bank now offers personal current accounts alongside products such as insurance, personal savings and credit cards, with loyalty card points acting as incentives.

- Sainsbury's Bank started trading in 1997 as a joint venture with the Bank of Scotland (later Lloyds Banking Group plc, LBG), targeting the regular Sainsbury's shopping with regular financial offers and rewards.²⁰⁰ In 2013, Sainsbury's Bank announced that it would acquire LBG's share of the bank and set out a 42 month transition plan to move onto a BiaB platform provided by FIS. The platform is intended to a better digital offer to consumers and enable new product launches, and the bank intends to provide only contact centre services in-house.²⁰¹

While BiaB can provide a valuable service for new entrants, interviews with industry participants highlight mixed views on the material impact of BiaB on barriers to entry. BiaB helps address one of a variety of barriers to entry, but it is important to recognise the existence of other barriers, which are potentially more significant. For instance, the level of capital required by a new bank may limit new entry to established household brands (e.g. Sainsbury's) and uncertainty in the authorisation process may act as a deterrent.²⁰² To the extent that it does support market entry, BiaB may have a beneficial impact on customers if it facilitates more choice, better quality, or lower prices. Recognition of niche markets by new entrants to the banking industry, especially in the case of SMEs, will also have wider economic benefits. However, interviews with an industry participant from the Nordic markets suggest that the evidence of such impacts is relatively limited, as banks operating "in a box" are small and typically have limited influence on market prices. Nevertheless, that there are several examples of banks entering with the BiaB technology and going on to develop significant market shares.

- Skandiabanken, the Swedish Internet-based bank, entered the Norwegian market in 2000 as the country's first Internet bank and operates on BiaB services provided by EVRY. Skandiabanken became popular in Norway because of its zero-fees strategy (which was less common at the time) and now has over 365,000 customers (the total population of Norway is approximately 5.1 million).²⁰³ However, according to an industry participant, the role of BiaB in supporting this growth is thought to be secondary to the quality of the business proposition.
- In Russia, Tinkoff bank, founded as an online-only bank in 2006 using BiaB technology, has since grown to be one of the top four providers of credit cards in Russia, with a 6.7% market share²⁰⁴ and 5 million credit card customers; it has also developed an online retail deposits service. However, market experts suggest that the use of this technology remains unlikely to significantly disrupt the generally conservative Russian banking market.

7.2.2 Barriers to product differentiation and growth

Interviews with industry participants suggest that for BiaB users, there are some constraints on the extent to which they can differentiate their products and also potentially the extent to which they can expand.

As BiaB allows users to implement only products and services that the host platforms support, there are limits on the extent to which banks can differentiate products. In general, product differentiation may occur at the front end, but the products are likely to be constrained by the back-end functionality. However, interviews with industry participants suggest that these constraints may be less significant for slightly larger BiaB users. This is because they are more able to pick and choose the components of the BiaB stack they want while providing their own components in other places. Thus product differentiation can be achieved by increased selectivity of the various components of the stack.

²⁰⁰ <http://www.sainsburysbank.co.uk/jobs/aboutus.shtml>

²⁰¹ J Sainsbury plc, 2013

²⁰² Bank of England and Financial Services Authority, 2013

²⁰³ Evry, 2013

²⁰⁴ <https://www.tinkoff.ru/eng/about-bank/>

The constraints on product differentiation also limit the ability of BiaB users to grow. This is because as banks grow, they typically seek to differentiate across a broader range of services and develop more idiosyncratic requirements. However, BiaB is not well suited for complex requirements. As a result, BiaB users are typically small. According to industry participants in the Nordic markets, “in a box” players typically have no more than a million customers and focus on retail customers and SMEs, rather than large corporates, which have more complex needs.

The use of BiaB within large incumbent banks is rare, highlighting how the primary advantage of the technology is to provide a ready-made bank.

Though still rare, it is more likely that a Tier 1 incumbent bank will implement a single component of BiaB if the innovation is to be used at all. For instance, the Commonwealth Bank of Australia implemented SAP’s core banking system in 2008 in order to accelerate time to market and to reduce the operational failures and risks caused by legacy systems.²⁰⁵ The bank has since reported a 30% reduction in processing errors across the branch network and a 75% reduction in time to market. However, a market participant commented that though core banking platforms can provide a lot of functionality, in particular universal banking platforms, older incumbents are less likely to use them as they attempt to be a general factotum. The incumbents instead seek specialist applications for key elements, for example finance, fraud, or credit checks.

In addition, increasing efficiency and adapting to technology change through replacing systems is expensive and risky for those banks using legacy systems, as they must continue to be able to serve their customer base whilst making the transition. Instead, systems are updated using targeted services that are often provided by BiaB providers. The use of ‘middleware’, for example, allows legacy banks to integrate new capabilities; Oracle’s Fusion Middleware Solutions allow for the use of big data, something that did not exist when legacy bank systems were built.²⁰⁶ Section 6 highlights some of the barriers to incumbent banks in using big data.

The implications of BiaB for barriers to expansion may vary according to the type of service provider (i.e. whether it is a bank or a technology company). A parallel can be drawn between banks using a bank hosted service and MVNOs (Mobile Virtual Network Operators) leveraging a MNO’s (Mobile Network Operator’s) network in the telecommunications industry. In both cases the user rents the infrastructure of a larger market player. Lessons from the mobile industry show that such arrangements may generate barriers to expansion as the host network is incentivised to limit the potential growth of the MVNO. On the other hand, when services are provided by technology companies, which do not participate directly in the market, such considerations are not likely to be relevant.

7.3 Summary

BiaB provides a useful platform for challenger banks to enter the market quickly and without incurring large IT costs. While the BiaB market in the UK is less mature than other markets in Europe and North America, there are a number of instances of challenger banks entering and planning to enter the market on BiaB platforms, targeting specific market segments. Evidence from the Nordic markets suggests that although BiaB helps to facilitate entry, there may be limits on the extent to which users can develop market share. This is partly because of the constraints that BiaB places on the capacity to differentiate and to offer more complex services. However, as the BiaB market becomes more mature and service providers offer more customised solutions, this constraint is likely to diminish allowing BiaB growth to potentially increase.

²⁰⁵ Commonwealth Bank, 2013

²⁰⁶ <https://www.oracle.com/middleware/index.html>

8 Innovation and SME banking

This section considers the implications of the innovations for the market for SME banking services.²⁰⁷ A key constraint on the analysis is the limited availability of SME-specific quantitative data on the innovations - most of the evidence that is reported in relation to the innovations refers to PCAs. Where possible the evidence gaps are addressed with insights from industry participants, which include an academic expert on SME financing issues and a representative of a small business trade association.²⁰⁸ However, as a result of the limited data availability, the analysis in this section focuses more on the mechanisms by which the innovations are likely to impact the market.

Differences in the characteristics and financial needs of SMEs mean that there is some variety in the issues they face and the relevance of various banking innovations to the SME. A key driver of this variety is differences in size: interviews with industry participants in the UK and abroad highlighted the point that sole traders and many small businesses often have customer characteristics that are similar to personal customers and hence many of the considerations that are relevant to PCAs are also relevant to most SMEs (76% of UK SMEs have no employees and the vast majority of the remaining SMEs have fewer than 50 employees).²⁰⁹ As a result, many of the insights provided by industry participants relate to small businesses. However, despite accounting for less than 1% of the number of SMEs, SMEs with more than 50 employees account for approximately 20% of SME employment and 30% of SME turnover. Larger SMEs are therefore likely to have more complex needs and possibly require different products and services than smaller SMEs.

Table 9, which is presented in the joint CMA/FCA report on banking services to SMEs, summarises some of the ways SME banking needs vary by size.

²⁰⁷ In addition to the provision of business current accounts (BCAs), the scope of the CMA investigation also covers general purpose business loans (GPBL) and other products such as deposit accounts, credit and charge cards, commercial mortgages, asset finance and invoice finance.

²⁰⁸ Industry participants also highlighted the lack of innovation-specific data as an issue but offered insights about the potential relevance of the different innovations.

²⁰⁹ Department for Business, Innovation & Skills, 2014b

Table 9: Characteristics of SMEs and their banking needs

	Turnover	Broad characteristics	Use of regular finance	Use of specialist finance	Typical providers
Smallest micro businesses	Below £50,000	Cash-based firms, often part-time business; few tangible assets; local operations	Limited mainly to overdraft, loans and credit cards or personal finance products	Limited. Some asset-backed lending (ABL) – mainly vendor finance	Banks, credit card providers and point of sale (vendor finance)
Micro businesses	£50,000 - £1m	Increasingly full-time firms with staff, premises and assets; local activity normally limited to a single region; occasional export	Overdraft, loans and credit cards	Increased use of structured ABL. Occasional use of trade finance products	Banks, credit card providers, specialised providers for ABL and trade products
SMEs	£1m - £25m	Full-time, larger multi-regional and national firms; increasing export/import activity	Overdraft, loans	Still some use of ABL, factoring and invoice discounting, export finance, some equity finance	Banks, credit card providers, specialised providers, business angles, private equity

Source: 2010 Business Finance Taskforce Report, quoted in CMA/FCA 2014a

8.1 The potential impact of banking innovations on SMEs

The innovations considered in this study have varying potential to impact the market for SME banking services, with impacts differing across to market segments (particularly by size segment). To the extent that some SMEs behave similarly to individuals in the way they manage their finances and choose between financial products, some considerations are similar to those for PCAs. However, for many cases the banking needs are more complex than those of individuals and the innovations have slightly different impacts. Four key issues in SME banking that can be used to assess the potential market impact of the innovations in this report are identified below:

- **Financial management:** A recent survey by BIS found that 50% of micro businesses cited cash flow as an obstacle to the success of the business, with fluctuating income or outgoings the biggest driver of the problem.²¹⁰ This is unsurprising given that a significant portion of SMEs adopt a relatively informal approach to financial management. For example, only 38% of SMEs produce regular management accounts while 27% of SMEs have a qualified person in charge of finances.²¹¹
- **Customer switching:** Survey evidence from Charterhouse finds that the proportion of BCA holders that switched their primary bank in 2014 was 4%.²¹² Low switching rates may be explained by factors that contribute to difficulties in comparing across providers.²¹³ These include: the complexity of BCAs,²¹⁴ the

²¹⁰ Department for Business, Innovation & Skills, 2014a

²¹¹ BDRC Continental, 2015

²¹² The switching rate is the proportion of customers that changed their main provider in the last 12 months. Competition and Markets Authority, 2015

²¹³ Competition and Markets Authority, 2015

differences in needs across SMEs, and the ability of SMEs to negotiate on price. In addition, the costs associated with switching banks may be another key reason for the low rates. The CMA note that the process of opening a BCA can be lengthy and onerous depending on the complexity of the business, while survey evidence indicates that SMEs do not want to spend significant amounts of time dealing with bank applications.

²¹⁵Given the role of the BCA as a gateway to other financial products, it is possible that the difficulties encountered in switching BCAs may impact the ease of switching for other products.²¹⁶

- **Branch reliance:** A key barrier to entry for the SME banking market is the perceived importance that SMEs place on a comprehensive branch network. Recent research from Charterhouse finds that over 80% of SMEs have used a branch counter service over the past year and 23% report that it is their most used method of banking. Furthermore, the availability of bank branches has been found to be an important determinant of an SME's choice of bank. The CMA cites a YouGov survey that finds 30% of new businesses rate "convenient branch location" as an important or very important factor when choosing a bank,²¹⁷ while recent research by Charterhouse finds that the presence of a local branch is the second most important pull factor (after good service) for banks that are switching provider.²¹⁸
- **Informational asymmetry:** Asymmetric information in the SME banking market makes it difficult for banks to assess the credit-worthiness of SMEs. The difficulty in assessing the credit risk or other characteristics of small businesses means that the current account information that the business' primary bank holds gives it a competitive advantage over other banks. Marquez (2002) argues that as banks have better information on SMEs that they already serve, larger banks may be able to screen SMEs more efficiently. Furthermore, banks can use this data to inform lending decisions, but also to cross-sell other products such as insurance and mortgages. Moreover, should the bank not want to extend the service when it has this information, then other banks may regard this refusal as a signal about the credit risk of the SME. This adds to the costs of acquiring new customers and hence increases barriers to entry.

8.1.1 Industry insights

The analysis here is based on quantitative evidence relating to SMEs, where it is available, supplemented by insights gained from interviews with industry participants. Industry participants have highlighted challenges in the availability of SME-specific data across the various innovations and the insights were focussed particularly on the smaller business segments.

Overall, industry participants expressed mixed views on the potential for these innovations to impact the market for SME banking. Some innovations - bank in a box, digital wallet and big data - were recognised as having particular potential to impact the SME banking market beyond what is relevant to the PCA market. Acknowledging the relatively nascent stage of development of digital wallets and big data applications in particular, some industry participants pointed out that adoption and broader impacts can develop quickly. Mobile banking, which has the greatest availability of SME-specific data, was thought to have potentially positive impacts by supporting cash-flow management, particularly for small SMEs. But in general doubts remain about the extent to which it can erode the importance of branches for SMEs. Similarly, industry participants recognised the potential value of price comparison websites to SMEs, but some doubted the capacity of less financially sophisticated SMEs to fully understand the nuances of the alternatives offered to them, potentially limiting their impacts.

²¹⁴ Relative to PCAs, BCAs have more bespoke needs and charges may vary according to how the account is used

²¹⁵ Department for Business, Innovation & Skills, 2013

²¹⁶ Competition and Markets Authority, 2015

²¹⁷ YouGov, 2013 reported in Competition and Markets Authority, 2015

²¹⁸ Charterhouse Research, 2014

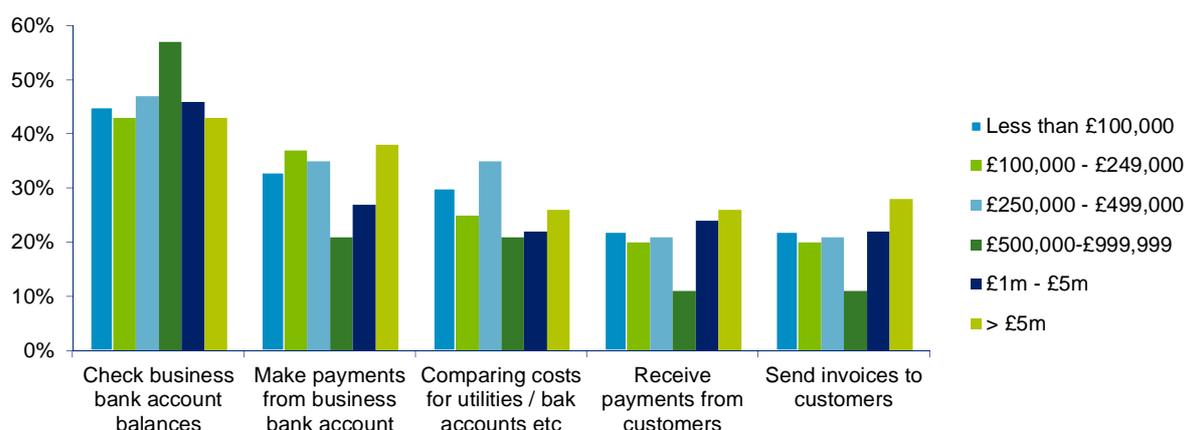
Each innovation is considered in turn below and the analysis reflects discussions with industry participants.

8.1.2 Mobile banking

There is limited current evidence on how SMEs use mobile banking across different markets. A recent Charterhouse survey reports that at least 19% of SMEs used mobile banking at least once in 2014, while in Australia 32% of SMEs reported to have used a mobile banking app within a four-week period in November and December of 2013 (this figure is 50% higher than the previous year).²¹⁹

Figure 32 shows that the use of mobile banking across differently sized firms is widely dispersed and that size does not play a significant role in adoption. As with individuals, the data also suggests that SMEs mainly use mobile banking to check balances.

Figure 32: Business activities undertaken using smartphones and tablets with mobile internet access, 2013



Source: *The Open University, 2013*

Base = SMEs that use smartphones/tablets

As mobile banking becomes an increasingly established bank channel, the functionality of the offering is likely to improve and this may make it a more advanced financial management tool. An example of this is the Daily IQ mobile analytics app for SMEs which the Commonwealth Bank of Australia launched in 2014. The Daily IQ app provides SMEs with tailored analytics on cash flow, sales and customers. These are designed to help support the financial decision making of the banks' SME customers.

Other Australian banks aim to turn their small business clients' mobile phones into portable electronic point-of-sale machines.²²⁰ The Westpac and St George PayWay facility, introduced in July 2012, is one such example. Other mobile applications have focussed on ease of use of applications - for instance, adding 'drag and drop' capability - while others have added extra security layers such as Commonwealth Bank of Australia's USB-based security device, NetLock.

While the growth of mobile banking has meant that SMEs can now perform some transactions on their mobile phone instead of in a branch, there remain constraints on what can be done and these constraints are potentially more relevant to SMEs than they are for individuals. For example, because they have more complex banking needs than individuals, SMEs typically require more interaction with bank staff and possibly a relationship manager and, although some mobile banking apps are developing more sophisticated chat options, mobile banking is not likely to provide an adequate substitute for this element of branch interaction. Similarly, while mobile banking offers an alternative for many basic day-to-day transactions, many of the most important services are still performed in the branch. Industry participants explain that even in Turkey, where Garanti's mobile

²¹⁹ Australia Business Review, 2014

²²⁰ Asia-Pacific Banking & Finance, 2015

banking app is particularly advanced and the SME market is a key strategic segment, SME customers are still required to come into the branch to finalise a loan application. There are also limits to the extent to which mobile banking can be used for transactions in the UK. For example, although for many banks the upper limits on the size of transactions are as high as £100,000, other banks have substantially lower limits (e.g. Metro bank has a limit of £12,000). Moreover, some banks, such as TSB, do not offer mobile banking services for business customers, even though they do for PCAs.

Nevertheless, business-specific mobile apps are being developed with a degree of success. Across all markets in which it operates, Danske Bank has witnessed a decline in the number of bank branches serving business customers from 490 to 330 between 2014. Over the same period, the number of logons to business mobile applications has risen from 65,000 to 170,000 on smartphones and from 6,500 to 23,000 on tablets.²²¹

8.1.3 Digital wallet

The development of digital wallets may impact SMEs directly by providing competition to banks in the market for the provision of payment acceptance services. By offering alternatives to the traditional model of bank-led acceptance, the emergence of digital wallets such as PayPal may put downward pressure on MSCs and/or increase the convenience of acceptance for SMEs. A potential indirect impact of the development of digital wallets is that, because of their access to SME transaction data, they may be well placed to offer alternative credit products to SMEs. For example, digital wallet providers such as PayPal, Amazon and Alibaba, have already begun to offer financing based on sales information:

- **Alibaba:** In June 2010, Alibaba launched Alipay Financial, a microcredit company based in Hangzhou, to offer loans to existing SME users of its e-commerce services. Within the first two years of launch, Alipay Financial had made loans worth RMB13bn (\$2.09bn).²²²
- **Amazon:** Amazon Lending was launched on 1st July 2015 in the UK and has been in operation in the USA since 2011 with approximately \$1 billion of capital lent to tens of thousands of small US traders.²²³
- **PayPal:** PayPal's Working Capital service, launched in 2013, has offered 90,000 of Paypal's merchant account holders lending facilities of up to \$20,000. Eligible businesses are selected on the basis of their sales history rather than credit checks and repayments can be made via a share of the businesses' Paypal sales.²²⁴ Since 2013, it has provided more than \$500 million in capital²²⁵ while as of December 31 2014, the outstanding balance of merchant loans was approximately \$99 million.²²⁶

The use of this data helps alleviate the issues surrounding asymmetric information as the emergence of such offers may apply competitive pressure on banks, which have traditionally dominated the market for SME credit. Taking Alibaba as an example, they launched a joint initiative with Chinese banks in the summer of 2014, offering loans of up to \$1.6m dollars.²²⁷ While data on the scale of lending is limited, one report suggested that \$10m was

²²¹ Danske Bank, 2014

²²² The Association of Chartered Certified Accountants, 2014

²²³ Lubbock Fine, 2015

²²⁴ American Banker, 2013;

<https://www.paypal-community.com/t5/PayPal-Forward/Introducing-PayPal-Working-Capital-A-Faster-and-Easier-Way-to/ba-p/781604?profile.language=en>

²²⁵ See: <http://www.businessfinancenews.com/22887-amazoncom-inc-expanding-loan-services-to-china-and-india-among-other-countr/>

²²⁶ PayPal, 2014

²²⁷ China Daily, 2014

lent in the first month of operation.²²⁸ Alibaba launched a similar initiative to support UK SMEs wishing to export to China in March 2015.²²⁹

The potential for digital wallets to impact the market in this way will depend on the extent to which they can effectively compete with banks in the provision of credit. A challenge to the adoption of such alternative forms of borrowing is the attitudes of SMEs towards non-bank finance. Industry participants highlight the reluctance of many SMEs to adopt alternatives to bank finance. However, recent research suggests that the alternative finance market in the UK is substantially more advanced than the rest of Europe and growing, suggesting that it may be increasingly relevant in the future.²³⁰ However, currently there is limited evidence to suggest that digital wallets are having a material impact on the market.

8.1.4 Aggregators

Section 5 showed how PCWs may provide useful tools for customers to compare PCAs. In contrast, the complexity of BCAs mean there are likely to be limitations on the potential for price comparison websites to provide appropriate assessments of alternatives. Evidence from the FCA indicates that the usefulness of price comparison websites may be lower the more complex the product. In a thematic review of PCWs operating in general insurance published in 2014, the FCA reported concerns that the headline price and brand receive particular attention in search results, when there are a number of other factors that are important.²³¹ The FCA concluded that the inability to provide clear information meant that customers may buy products without understanding key features. The CMA also notes that there is currently an absence of effective price comparison websites for BCAs.

Reflecting this, some industry participants have expressed doubts over the capacity of many SMEs to fully appreciate the nuances of the information that PCWs provide. The implication would be that PCWs may have different impacts on customer decision making according to the market segments. In particular there would be relatively minor impacts on the switching behaviour of less financially prepared SMEs.

The CMA also notes that switching may be limited by the premium that businesses place on having all their accounts and finances being in one place and suggest that many businesses are willing to forego the benefits of switching to ensure this is the case.²³² The more banking services the SME uses, the more likely this is to be a barrier to switching. By foregoing the benefits of switching, the SME is effectively paying the bank to perform the role of an aggregator.

However, the emergence of free aggregator services and firms that provide additional financial services on top of account aggregation, potentially reduces the requirement of banks to perform this service and reduces this barrier to switching. The low incidence of multi-banking by SMEs in the UK may suggest that SMEs value having all of their finances in one place.²³³ Alternatively this can be interpreted as implying that SMEs would not gain much from having access to an aggregator.

Currently there is limited data on the extent to which SMEs use aggregators, so the significance of these effects is unclear. Nevertheless, there are account aggregator apps that may prove helpful for SMEs by allowing them to better manage their finances and access key market information. Xero, an account aggregator app in New Zealand has obtained 80,000 customers as of 2013, while Bode Tree in the US provides specific financial

²²⁸ Alizila, 2014

²²⁹ Business Finance Compared, 2015

²³⁰ Ernst & Young and University of Cambridge, 2015

²³¹ Financial Conduct Authority, 2014b

²³² Competition and Markets Authority, 2015

²³³ Evidence submitted to the Treasury Select Committee by ACCA show the share of SMEs using banking services from more than one bank in 2013 was less than 3%.

services, such as forecasting, access to a network of banks and alternative bank lenders, on top of general account aggregation.^{234 235}

8.1.5 Big data

The emergence of credit scoring techniques that draw on big data, although in their infancy, have the potential to address the informational advantage that incumbent banks have in the market for SME lending. Current accounts traditionally provide a valuable source of data for lenders and the most SMEs take loans from their BCA provider. However the increasing use of big data may loosen the link between the provision of current accounts and credit products as it becomes possible to effectively assess the credit risk of an SME without seeing their current account transactions.

The use of sales data by digital wallet providers, as discussed above, is an example of this. In addition there are examples of fintech companies in the US, such as ZestFinance and Kabbage that combine assorted data sources to support credit risk scoring of SMEs. While Kabbage only launched in the UK in 2013 and hence remains relatively small scale, in the USA, where it has been operating since 2009, it was lending \$1 billion per year within four years of launch.

In emerging markets, big data has the potential to provide increased credit access to SMEs. An example of this is Alibaba's Sesame Credit in China, which makes use of its internal big data on consumer and small business behaviour and transactions. This has enabled banks to lend based on smart information about the activity of small businesses rather than on the simple stock of collateral.²³⁶

However, the application of big data to credit scoring in regions with more developed credit markets remains relatively undeveloped and the future of the industry will depend on the extent to which it is constrained by data protection regulation. Industry participants have identified the risk that increased compliance costs will limit the incentives for greater investment in this area. Similarly, as discussed above, the adoption of these alternative lending models will depend on the extent to which SMEs are prepared to use non-banks for their financing needs.

Some international industry participants highlighted the importance of relationship managers in the market for SME lending, suggesting that, while novel, new methods of credit scoring do not adequately substitute for interaction with through the branch channel. The relevance of this consideration is likely to vary across markets according to the prevalent model of SME lending. In general, the UK market can be characterised more as "transactional" than "relational".²³⁷ All else equal, these barriers may therefore not be as substantial as they would be in markets such as Germany or Italy, where SME lending generally follows a relational model.

8.1.6 Bank in a box

By lowering barriers to entry and allowing banks to operate at a small scale, BiaB facilitates the entry of niche banking service providers, such as those specialising in SME banking. For example, Holvi, the online Finnish bank, was able to launch and specialise in SME services because of its use of BiaB technology. This provides competitive pressure to the larger banks. Moreover, the use of BiaB allows smaller banks to offer particular SME-focussed services that they may not otherwise be able to do. For example, for SMEs, and particularly microenterprises, the account opening process can be complex and pose a barrier to switching. By selecting different components of the stack from different providers, including the services of an identity intelligence

²³⁴ NZ Business, 2013

²³⁵ <http://bodetree.com/product/features/>

²³⁶ Financial Times, 2013a

²³⁷ Transactional lending (or "arms-length financing) is characterised by the focus of lending decisions on 'hard' information such as company accounts, collateral and bank account history. In contrast, relational lending uses 'soft' qualitative information to inform the lending decision. This information can only be collected through personal, and frequent, interaction with the bank (or more specifically a bank account manager).

specialist, Holvi is able to perform its customer due diligence much more rapidly than would otherwise be the case.

The magnitude of impact that BiaB can achieve will depend on the share of the market that BiaB users are able to attain. In the UK this is currently very small, but as new challenger banks enter the market this may increase. Evidence from more developed markets, such as the Nordics, demonstrates the potential for BiaB to be a widespread technology.

Despite examples of BiaB supporting SME-focussed banks, some industry participants have highlighted the importance of local branches as a potential constraint on the extent to which BiaB can impact the SME banking market. BiaB users typically have a minimal branch presence and this appears to remain an important factor in the choice of banks that SMEs make. The overall potential of BiaB to impact the SME market is therefore likely to depend on the extent to which BiaB users can offset this disadvantage with improved services for SMEs.

8.2 Summary

As the availability of SME-specific evidence on the innovations covered in this report (such as the adoption of mobile banking, aggregators and digital wallets) is relatively limited, there are challenges to quantifying their market impacts or identifying key differences relative to the PCA market.

Despite this the analysis in this section provides some insights into how the innovations may impact the market:

- **Financial management:** As with PCAs mobile banking has the potential to support financial management. Larger SMEs appear to use the service as often as smaller SMEs and evidence from other markets shows that mobile banking apps can be tailored to the more complex needs of larger companies.
- **Customer switching:** Aggregators do not appear to have a significant potential to support customer switching. This is because of the complex nature of SME products. BiaB may support switching by facilitating entry by SME-focussed banks, which may be better equipped to address the needs of SMEs, but these banks will have to overcome other challenges such as having a lower branch presence.
- **Branch reliance:** There is limited evidence that any of the innovations can significantly erode the importance of branches to SMEs.
- **Informational asymmetry:** The use of alternative sources of data to assess credit risk by digital wallet providers and fintech companies that use big data has the potential to address the issues that arise from the presence of asymmetric information in the market for SME lending. However, these developments are still in a nascent form and the regulatory landscape may inhibit significant expansion.

9 Implications for competition

9.1 Innovation in the UK relative to other markets

This report has considered the emergence and development of five key innovations in the UK banking sector and worldwide. It is challenging to compare the degree of innovation in the UK with other markets as there is a lack of systematic data on investment and/or utilisation. Moreover the quality or benefits derived from innovations are hard to determine and compare. To the extent that comparison is possible, the UK appears to be ahead on some measure and behind on others. For example the utilisation of mobile banking is comparatively high in the UK as are price comparison aggregators. In contrast the UK has not experienced the development of account aggregation services as observed in the US. However the situation is less clear for other technologies. While BiaB and big data lack are relatively better developed technologies, structured data necessary to systematically compare markets has not been identified and there was no consensus view amongst the market participants interviewed. Finally, digital wallet is a nascent technology and therefore it is too early to determine how the UK stands in relation to other markets.

While this limits the conclusions that can be drawn, there does not appear to be evidence that the UK is systematically lagging in terms of innovation. Interviews with market experts also suggest that investment in new technology is a critical issue on board agendas.

9.2 The impact of innovation on the market for PCAs and SME banking

Turning to the potential impacts of innovations on competition, each innovation has been discussed in the context of the CMA's theories of harm:

- Theory of harm 1: Impediments to customers' ability to effectively shop around, choose and switch products or suppliers, resulting in weak incentives for banks to compete for customers on the basis of price, quality and/or innovation.
- Theory of harm 2: Concentration giving rise to market power of some banks leading to worse outcomes for customers.
- Theory of harm 3: Barriers to entry and expansion leading to worse outcomes for customers.

The potential impacts of each of the innovations considered are summarised in the table below.

Table 10: Summary of the impacts of the innovations

	Theory of harm 1	Theory of harm 2	Theory of harm 3
Mobile banking	Evidence suggests use can raise financial awareness, potentially promoting switching behaviour; on the other hand, it may promote lock-in.		May potentially facilitate entry by digital-only banks, such as Atom Bank. No evidence that this has had a significant effect on competition in the market
Digital wallet	Wallets can potentially facilitate use of multiple accounts through a single app; however if a single card or account is set as the default it may reduce switching and financial awareness.	Impact on concentration currently limited as most rely on a card-based payment model. Payment from account balance has potential to have a greater impact. Disintermediation may reduce the market power banks obtain from proprietary information.	Due to the transaction data obtained by providers of these services, barriers to entry in the SME lending market may be reduced (see big data).
Aggregators	Use of price comparison aggregators is currently limited, but combined with better access to personal data they can facilitate switching. Account aggregators provided by third parties can promote switching by increasing financial awareness and promoting products. Those provided by banks may generate more opportunities for cross-selling and lock-in	As with digital wallets, use of aggregation services provided by third parties can lead to disintermediation. If information becomes less concentrated in hands of banks, they may lose some market power.	Price comparisons websites may reduce the costs of reaching new customers, potentially reducing barriers to entry.
Big data	Improved customer access to data (e.g. through Midata or similar schemes) can facilitate switching. However, banks can make use of own data for cross-selling and to improve customer retention in markets for BCAs and PCAs. Use of non-traditional data in market for SME lending enables SMEs to access a wider range of providers.	Use of big data and data from other sources (e.g. transaction history, social media) can reduce concentration in the market for SME lending. Banks may lose their informational advantage, and hence some of their market power, in this space.	Costs of using big data may be lower for new entrants; established banks more likely to be encumbered by legacy IT systems. This can reduce barriers to entry, especially in the SME lending market.
Bank in a box		By reducing barriers to entry, may potentially enable niche and specialised services to develop, reducing concentration in some markets.	Reduces the cost of entry into the market.

Source: Deloitte analysis

At present, there is little evidence to suggest that any of these specific innovations, when considered individually, is having a significant impact on the market, although they may have the potential to do so in the future should they prove popular with consumers and businesses. The analysis of the competitive impact of each of these innovations is also complicated by the fact that the direction of impact may depend critically on how these technologies develop – for example, on whether services are supplied by established banks or by third parties. Lastly, it is worth emphasising that these innovations are not being used in isolation and the boundaries between different innovations may become increasingly blurred. For example, mobile banking and digital wallets can both potentially be integrated to provide account management, aggregation and payment services, taking advantage of big data in order to make recommendations about additional products and services.

In order to account for the complementarities between these innovations and how different services may affect the market when used in conjunction, the remainder of this section focuses on three issues that have emerged from the analysis of the specific innovations.

- **Increased contestability of specific services:** a combination of reduced operating and marketing costs – through Bank in a Box technology, the use of big data and the emergence of new channels for sales – has seen greater entry into the market, including by third parties such as technology companies. Many of these new entrants are focussed on specific services, such as payments or lending. Increased competition around specific services breaks up the end-to-end model of traditional banking.
- **Control over technology and information:** linked to the point above is the fact that in this evolving market control over technology and information may become increasingly fragmented. Examples include the fact that many aggregator and digital wallet apps are provided by third parties and the fact that these systems now mean that information may also be held by these third parties rather than by banks. However, there is still considerable uncertainty over how this market will evolve and which technologies will eventually come to dominate the market.
- **SMEs and the role of technology:** There is some debate over the extent to which SMEs demand differentiated services and whether innovations can address these demands. One area where innovation may be of relevance is in access to credit. However, UK SMEs already have access to more diverse sources of credit than SMEs in many other markets, and with SME lending being less vulnerable to disintermediation the impact of technology on this market may be limited.

These trends have the potential to alter the landscape of the banking market and affect competition.

The remainder of this section will discuss the implications of the themes mentioned above in the context of the CMA's theories of harm. However, it should be noted that there remains considerable uncertainty about these potential impacts. The impact of disruptive technologies is inherently difficult to predict; in particular, technologies that have been hyped as potentially disruptive may fail to take-off, while other technologies may be slower to emerge before suddenly becoming more popular with consumers. Moreover, the impact may depend significantly on which models come to dominate the market (for example, those provided by banks or those provided by third parties).

Increased contestability of specific services

A number of the innovations discussed in the report have the potential to lower barriers to entry; these include "Bank in a Box" technology that reduces the costs of operating and setting up a bank and the increased availability of big data that enables new entrants to use other metrics of credit-worthiness in order to enter the lending market at a lower cost. In addition to reducing operating costs, innovations such as account aggregators and price comparison sites provide an additional channel through which entrants can reach potential customers.

The development of these innovations has been accompanied by an increase in entry into the market. This includes entry by challenger banks, but also by companies providing specific services, such as loans, account management and payment systems. Currently, there is little evidence that these entrants threaten banks' core activities, notably the provision of personal and business current accounts. It is therefore unclear that this will have an effect on concentration in this market. However, by increasing the level of competition surrounding particular services, new entrants may pose a challenge to the business model of established banks. With specific

services becoming more contestable, banks may lose the ability to cross-subsidise different services through the bundling of products.

This increase in contestability may also affect customers' switching behaviour. At present, appetite for services such as digital wallets and account aggregators appears to be limited; this is due to a combination of factors, including concerns over security, constraints on access to account data and scepticism about their usefulness. However, should these services become popular, increased competition in this space could weaken the connection between banks and their customers, potentially increasing switching in the markets for other services such as PCAs.

Control over technology and information:

In the longer term, the impact on competition is expected to depend critically on whether the services that come to dominate the market are provided by third parties - in particular larger companies such as major technology providers – or by the banks themselves. This will in turn affect the levels of fragmentation and disintermediation in the market, with implications for the ease of switching and the level of concentration.

There are a number of factors that may affect this, including consumer preferences, the extent to which banks embrace these innovations and the regulatory environment. With consumers citing security as a concern in connection to the use of digital wallets and account management services, banks may have an advantage in the provision of these services; evidence indicates that consumers are more willing to trust established banks and card companies to provide these services than entrants such as PayPal, Amazon and Apple.

The regulatory environment may also have a significant impact, especially in regard to data privacy and the use of third-party data in connection to aggregation services and emerging channels for lending. These innovative services may be more sensitive to regulatory intervention than traditional banking services because they are less tied to physical infrastructure. While banks currently enjoy a competitive advantage due to their access to information, this may be weakened by policy interventions such as the PSD2 proposals and the UK government's Midata programme, which will allow third-parties access to account information. New entrants may also have an advantage in this area since they are not encumbered by legacy IT systems.

The implications for competition will differ depending on which model comes to dominate the market, if indeed services such as mobile payments and aggregators become popular with consumers. If third parties come to dominate these markets the connection between banks and consumers may be weakened, potentially increasing switching behaviour. Moreover, these services can create a new sales channel through which competitors can market to consumers, which may reduce barriers to entry. However, if apps developed by leading banks prove more popular in the long term this has the potential to increase lock-in and barriers to entry.

Implications for SMEs

Many of the innovations covered in this report are relevant to current accounts in general and are not specific to SMEs. Moreover, the fact that SMEs are generally more reliant on branch access and require more tailored financial services may limit the extent to which services such as mobile banking, price comparison sites and account aggregators can promote switching in this market.

One area where innovation may have a particular impact on SMEs is by making use of big data to enable SMEs to access credit through non-traditional channels. The ability to assess credit-worthiness using metrics other than conventional credit scores has reduced barriers to entry. Examples of new entrants include services such as Kabbage, which make use of data including transaction and shipping history, social media engagement and online reviews in order to assess credit-worthiness. At the same time, companies such as PayPal and Amazon are moving into this area, making use of the data that they hold on transaction and payments history. Although not the focus of this report, services such as crowd-funding and peer-to-peer lending are also a part of this trend.

At present, it is unclear whether the availability of credit through these channels is promoting customer switching or reducing demand for credit from established banks. Survey evidence suggests that the majority of those using online lending services have been unable to access credit through traditional channels. However, businesses

also cite convenience and flexibility as motivations for using these services, suggesting that they could eventually pose a greater challenge to traditional SME lending models. The impact of these services is likely to be greater if combined with changes in payment technology that reduce banks' access to information.

Conclusion

While interviews with interview participants have highlighted the strategic importance of technology/innovation investments to banks, there is to date no clear evidence that the specific innovations considered by this report have yet had material impacts on competitive market outcomes. While this may change in the future as the technologies develop, it is inevitably difficult to speculate over the future impact of technology on competition.

Moving beyond the specific innovations that are the focus of this report, the evidence gathered and interviews with market participants suggest that these are indicative of broader trends in the banking sector, which may potentially have an impact on competition in the longer term. In particular, increased entry into the market for certain services – whether by challenger banks or by technology companies moving into this space – can disrupt the business model of established banks by making individual services more contestable and reducing the likelihood of customers relying on a single bank for all their financial needs. Moreover, this presents a threat to a key competitive advantage for established banks: their access to proprietary information. These two factors together suggest the potential for less concentrated market and a higher level of disintermediation.

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