

Innovation in Payments:

The Future is Fintech



BNY MELLON

Table of Contents

1	Foreword	1
2	Executive Summary	2
3	The Growth of Fintech	3
4	Drivers of Change	4
5	Consumer and Retail Payments	6
6	Wholesale and Corporate Payments	8
7	How are Banks Responding to Fintech?	13
8	Recommendations	16
9	Conclusion	17

1 Foreword

By Dominic Broom, Head of Treasury Services EMEA, BNY Mellon

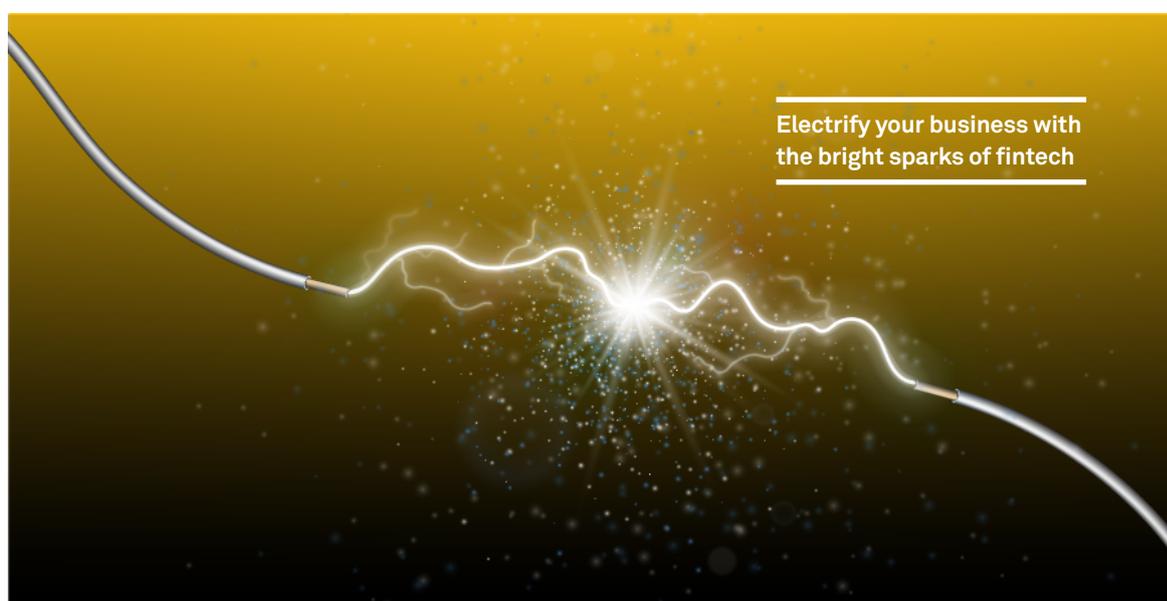
The wind of change in the payments world is gaining in strength as financial technology's ("fintech") potential to alter how, where and when payments are made – as well as who it is that facilitates them – is further explored and leveraged. This paper examines the growing capabilities of fintech in both the consumer/retail and wholesale/corporate payments arenas, and discusses the monumental role fintech – and the array of solutions it presents – will play in shaping the course of the payments industry as a whole.

Without a doubt, the "era of fintech" is upon us and banks can't merely be mindful of this; they must also have a clear plan in place in order to adapt to and benefit from fintech-fuelled changes. While the banking industry is traditionally more "conservative" to change – certainly fast-moving change – any hesitation or ambivalence here could be costly, particularly as new technology introduces not just new solutions, but also potential contenders to banks' long-standing reign as payment processors. In order to position themselves at the centre of the payments industry of tomorrow, banks must act today to understand, interact with, and cherry-pick from the full smorgasbord of fintech developments.

The range of options to choose from is broad and diverse. As the number and type of fintech players, developments and offshoots gather pace, the emergence of new tools and solutions (such as digital currencies and biometric security) are in turn gaining traction and reaching the market with ever-greater speed. To date, the impact of

these new entrants has been far more profound in the retail and consumer payments space (more of which in the following pages), yet these new payment capabilities and ideas are already diffusing into the area of corporate payments, as personal preferences influence corporate demand. Furthermore, in the continually-evolving payments sector, the impact of the fintech "revolution" isn't something occurring in isolation. It is important to remember that the corporate and wholesale payments industry isn't static, and that technology is already being leveraged to drive industry-wide improvements with regard to harmonisation, standardisation, centralisation and the development and application of increasingly sophisticated solutions.

Following on from our wider analysis of the payments industry (please see "[Global Payments 2020: Transformation and Convergence](#)"), this report hones in on the influence of fintech, to assess the direct (and indirect) impact of new technology on payments; the way in which it is moulding client behaviour and fuelling expectations for better, faster, more innovative solutions across the payments spectrum, and how industry changes are set to re-shape the corporate payments landscape. This report also examines what these advances mean for banks, and the strategies they should now adopt (in particular, far closer engagement with the fintech community) in order to understand and access these exciting developments, and thereby future-proof their long-held position at the heart of global payments.



Electrify your business with
the bright sparks of fintech

2 Executive Summary

Fintech is changing the face of global payments. Global investment in fintech ventures tripled in 2014 to US\$12 billion.¹ As new payment capabilities come to the fore, cutting-edge technology is transforming how transactions are initiated and processed. This is no longer just a case of new currencies or faster payment methods, but an entire rethinking of transfers of “value” and how these are undertaken. This presents both a challenge and an opportunity for banks.

A new breed of non-bank payment provider has kick-started a surge in payments innovation, ranging from fintech start-ups (those looking to leverage technology to bring advancements to the payments space) to established non-payments industry operators (such as Facebook and Apple). More fintechs are graduating from the ranks of start-ups to multi-billion dollar listed companies: at least 4,000 fintech start-ups are active and more than a dozen of these are valued at over US\$1 billion.² These new players are seeking to improve the payments experience of their customers in order to support their core (non-payments) business. From all angles, they are leading the charge in taking payments to the next level in terms of speed, convenience, efficiency and multichannel accessibility.

We are seeing innovation in different forms depending on the payments sector and market. The most significant changes are in retail payments, resulting in the unbundling of a range of financial services. The foreign exchange (FX) market in particular is being explored by non-bank providers, which are taking advantage of the cost-saving opportunities. In the wholesale and corporate payments sector, innovation and new solutions have been helped by industry-wide initiatives such as SEPA and TARGET2, which have established market standards and increased payment harmonisation.

However, in spite of this progress, some banks are currently underprepared when it comes to adjusting to such changes. This is due in part to the plethora of new regulation in the wake of the global financial crisis, diverting precious funds away from research and innovation, into compliance-related projects. But it is important to remember that high standards of regulation mean that banks are typically able to provide much greater levels of security and risk mitigation than non-bank players. Few non-bank

providers want to take on the heavily regulated parts of finance. It's also worth pointing out that you still need a bank account to use most fintech services.

While obligatory regulatory changes have placed pressure on bank resources, banks must now prioritise adopting a new technology-focused strategy. A recent report by Accenture revealed that 72% of senior industry executives felt their bank had only a fragmented or an opportunistic strategy in place for digital innovation.³ The speed of fintech-fuelled change in the payments arena means banks need to shake off their reputation as being slow to adapt by implementing swifter technology development cycles and replacing legacy payments systems.

The financial services industry already has one of the highest ratios of IT spend as a proportion of revenue,⁴ with levels expected to reach US\$197 billion in 2015.⁵ That said, over three quarters of this is estimated to be in maintenance rather than new services. Banks need to redress this imbalance.

Indeed, digital currency-based solutions and the potential they hold in terms of settlement mechanisms and exchange of value are forecast to act as a disruptive force in the wholesale payments sector as various fintech start-ups launch their offerings in the medium- to long-term.

In recognition of the growing role of fintech in the world of corporate payments, banks are exploring allegiances with some of these tech-savvy start-up companies, in order to expand their knowledge and understanding of potential developments, and to be a real part of the new digital direction of payments. Banks are doing this through a number of methods, including venture capital investment and accelerator/incubator programmes.

As heightened demand for enhanced user-friendly payment experiences filters through from the retail space into the wholesale and corporate sector, banks – regardless of size or market – must ensure they are positioned to tap into these exciting fintech developments, and leverage the creativity and flexibility of non-bank players. Failure to do so brings the risk of being outmanoeuvred by more nimble competitors, who will be quick to leverage the numerous opportunities this new payments landscape has to offer.

1 <http://www.fintechinnovationlablondon.net/media/730274/Accenture-The-Future-of-Fintech-and-Banking-digitallydisrupted-or-reima-.pdf>

2 <http://www.economist.com/blogs/economist-explains/2015/06/economist-explains-12>

3 <http://www.fintechinnovationlablondon.net/media/730274/Accenture-The-Future-of-Fintech-and-Banking-digitallydisrupted-or-reima-.pdf>

4 <http://www.dotain.com/Gartner.pdf>

5 <http://thetally.efinancialnews.com/2015/02/fn-fintech-focus-much-banks-spend-new-tech-investments/>

3 The Growth of Fintech

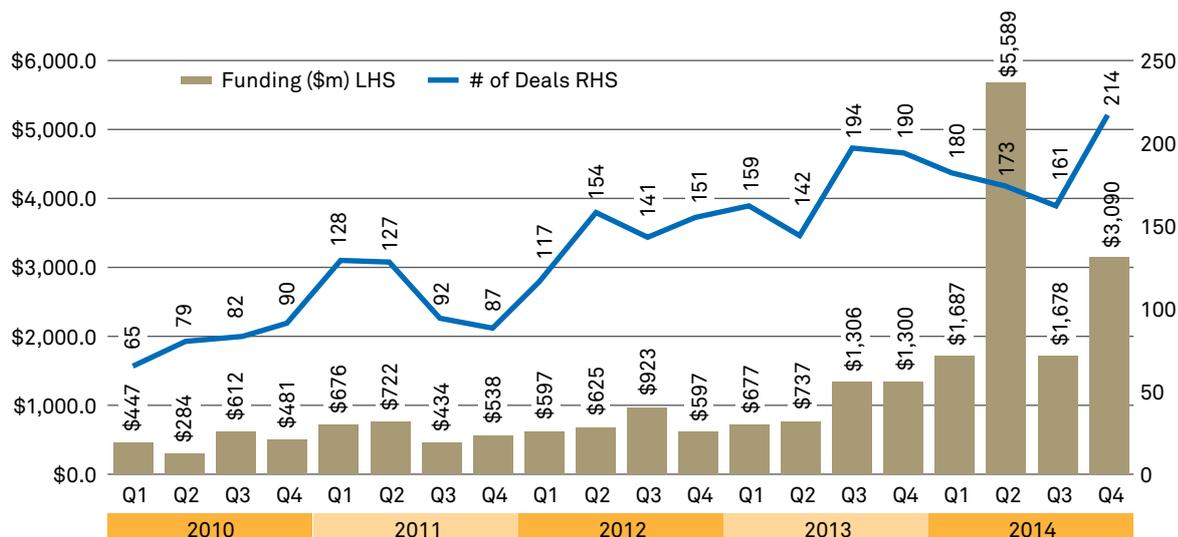
The past five years have seen a growing number of fintech start-ups and non-bank payment providers venturing into – and shaking up – the payments arena, taking advantage of an array of new technologies and market conditions, and leveraging alternative business models that could both disrupt and complement traditional payments practices.

This trend has been fuelled by a healthy increase in global investment into the fintech sector (see figure 1), led predominantly by venture capital, private equity and angel investors. Last year in the US, in one year alone, fintech investment nearly tripled,⁶ and such innovation enthusiasm is apparent around the globe. London, San Francisco/Silicon Valley and New York

have already established themselves as key hubs for innovation, and are fast being followed by new innovation centres around the world. Amsterdam, Stockholm, Paris, Berlin and Dublin, for example, have all been identified as key growth areas within Europe’s fintech ecosystem, and are complemented by thriving sectors in locations such as Tel Aviv.⁷

Furthermore, innovation is emerging in a range of business areas within the finance industry, with the main emphasis on the development of solutions addressing the needs of retail and small- to mid-market players, from lending, payments and “big data”, to messaging, security and FX.

Figure 1: Global investment in Fintech



Source: Investment Trends in Fintech, Silicon Valley Bank
<http://www.svb.com/News/Company-News/2015-Fintech-Report--Investment-Trends-in-Fintech/>

6 <https://newsroom.accenture.com/news/fintech-investment-in-us-nearly-tripled-in-2014-according-to-report-by-accenture-and-partnership-fund-for-new-york-city.htm>

7 <https://jaxenter.com/best-cities-work-fintech-developer-114542.html>

4 Drivers of Change

Technology is of course at the centre of the transforming payments landscape, with new and improved solutions and capabilities influencing consumer behaviour and expectations, as well as driving substantial industry change. Drivers of change include new technology itself and the subsequent chain-reaction of behavioural changes catalysed by the introduction of this new technology.

Technological developments

Innovation is occurring at a rapid rate, with payments-industry enhancements being developed and implemented at a faster pace than ever before, in particular around data management, security, and the move to modular IT.

Cloud-based solutions, for example, are flexible, cost-effective and can be scaled up to accommodate growing demands, enabling businesses to build and adapt their operations more effectively and efficiently. Elsewhere, application programming interfaces (APIs) enable the interaction between two or more online connected services, providing the opportunity to build solutions that integrate and combine different services and data sources.

While such processes are available to banks, it is the start-up sector – including online payment providers such as PayPal and Stripe – that has demonstrated the highest degree of adoption. In fact, new cloud and API technology has been instrumental in enabling the start-up sector to disrupt established players and accelerate change.

New technology has also significantly improved storage of, access to and interpretation of information and data – resulting in significant commercial benefits, yet also the need for greater information protection. Here again, however, new technology is providing an answer, with biometric security leveraging unique identifiers such as fingerprints, facial recognition, iris scanning and voice recognition to provide stronger security, while simultaneously improving the overall user experience.

More recently, proposals have been raised to increase payment and data security by reading and interpreting consumers' spending history.

For example, card providers can use data modelling to raise alerts regarding potentially fraudulent activity, and can check a payee's location via their mobile phone's GPS, providing a further data point with which to assess the validity of a transaction. For payment providers, these and other security initiatives offer the opportunity to push services out to smartphones and other devices (in line with customer demand) without increasing the associated risk.

For the banking industry, perhaps the biggest potential comes from the rise of "big data". Indeed, McKinsey, the consultancy firm, has already identified the banking industry as one of the market sectors that could most benefit from better use of customer and market data.⁸

Technology advancements have made it possible to effectively analyse and interpret vast, complex sets of data; uncovering untapped patterns and trends from which new client insights can be gleaned. This "smarter" data management allows banks to create more effective, client-centric solutions that are more aligned to client behaviour and needs. Such capabilities can permit banks to optimise their own internal processes and add significant value to clients through better understanding of their business. Banks can extend these enhanced data management capabilities directly to clients, who can use the insights in a number of ways, including as a means of cost saving through the identification of common errors, for instance.

Certainly, better information management can be a key differentiator, and there is a growing awareness in the business community of the value this data presents, and its significance as a source of competitive advantage if fully leveraged.

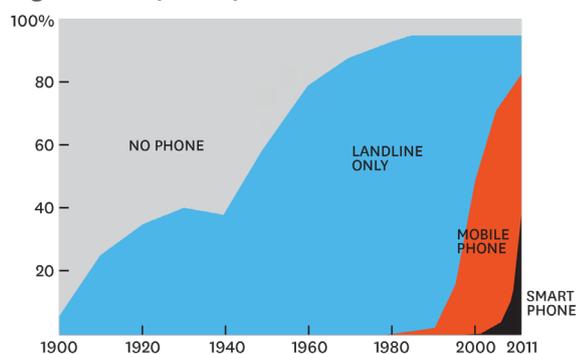
⁸ http://www.mckinsey.com/insights/strategy/are_you_ready_for_the_era_of_big_data

If banks don't react with urgency and adapt to these developments they are at risk of being overshadowed in the very sector in which they are traditionally renowned. As non-banks continue to introduce a host of new digital capabilities, an element of disruption is emerging within the banking sector – and the failure of banks to keep up and offer enhanced client solutions will only exacerbate this.

Market trends

Change comes not just from these new technology capabilities, but from the way in which (and extent to which) such advances are being adopted. In today's truly globalised world – where emerging markets have the ability to “leapfrog” their more developed counterparts, and where the transfer of new information is both instantaneous and global – the adoption and impact of new tools and solutions is more rapid and widespread than ever before. Indeed, today's breakneck rate of adoption is itself an enormous driver of change (see figure 2), with many new innovations now achieving mass-market penetration at a far faster rate than was ever thought possible, let alone likely.

Figure 2: Telephone penetration in the US



Reprinted with permission from November 2013 HBR blog, “The Pace of Technology Adoption is Speeding Up” by Rita McGrath. Copyright 2013 by Harvard Business Publishing; all rights reserved.

The almost inconceivable growth in mobile and smartphone usage (in 2014, the number of mobile phones in use surpassed the number of humans on this planet⁹) is placing digital services in the hands of consumers who previously couldn't be reached, delivering richer, value-added experiences across the globe. Boasting access to cloud-based technology and with consistently-fast mobile signals, smartphones are enabling digital services to be accessed by almost anyone, anywhere, anytime.

Such capabilities are having the most significant impact in emerging markets, particularly those with fast-growing middle class populations. These previously unbanked populations increasingly require financial services, and mobile phone technology allows access to payment solutions without the need for a dedicated physical infrastructure – again, speeding up the rate of adoption.

Industry change

Like consumer trends, industry changes can have a huge impact on payments innovation. The global financial crisis prompted the introduction of myriad new regulations to restore confidence in the banking industry; for example, introducing a greater emphasis on intraday liquidity and risk management. The result has been enhanced transparency and data visibility, which in turn aids cash management and can generate cost savings for clients. Furthermore, the element of security that such standards of regulation enforce is a key strength in banks' standing in the payments space.

Efforts to increase payment processing harmonisation have also been stepped up, through initiatives such as SEPA and ISO 20022. The establishment of these common standards is an important enabler in the growth of national and international payments infrastructures. Common standards have also enabled a more modular approach to IT in which new services can be added to existing systems without the need for complex intermediary layers.

9 <http://www.independent.co.uk/life-style/gadgets-and-tech/news/there-are-officially-more-mobile-devices-than-people-in-the-world-9780518.html>

5 Consumer and Retail Payments

Not surprisingly, the consumer and retail payments sector is the fastest-moving in terms of innovation and adoption of new payment capabilities. Growth in e-commerce has both facilitated and encouraged the further development of digital payments experiences, with the movement towards a “post-cash” economy also being driven by a growing consumer expectation for real-time payments.

With initiators of corporate payments regularly exposed to the enhanced possibilities available in consumer and retail payments (and to an increasing extent as the tech-savvy youth of today become the business leaders of tomorrow), demand for an optimised payments experience – in terms of speed, convenience and multi-channel accessibility – is diffusing into the corporate payments arena. Consequently, even banks operating purely in the corporate/wholesale sector must ensure they remain apprised of progress and developments in the retail and consumer space, if they are to anticipate and prepare for further changes to the payments business.

Such retail-side innovations include:

- **Mobile wallets**

The huge market penetration of smartphones is driving innovation in “mobile wallets”, which enable consumers to make payments via their mobile phones. For example, if a digitised version of a credit card is stored within a mobile wallet and used to make a payment, banks can link the card number to the user’s account and thereby authorise the transaction.

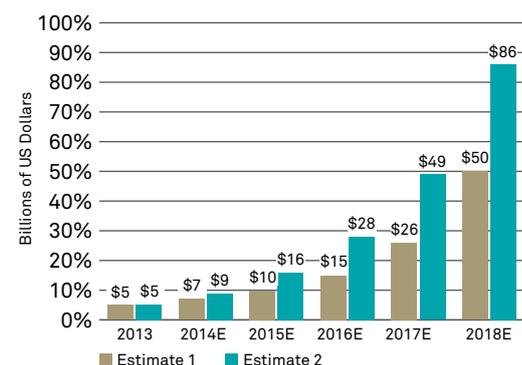
With payment security a key concern in today’s risk-averse environment and a prime factor in consumer receptiveness to mobile wallets, risk mitigation has been a particular focus for innovation in this area. The development of biometric data and tokenisation (which translates consumer credit card details into temporary “tokens”, allowing payments to be authorised without the need for disclosing credit card details to the retailer) are important steps towards addressing this issue and increasing confidence in mobile payments as a whole.

- **P2P mobile payments**

Person-to-person (P2P) mobile payments provide a means of transferring value between individuals via mobile devices and, in the case of

some services, from institution to individual and vice versa. The sector has seen healthy growth (see figure 3, which highlights estimated growth in the US) with forecasters expecting such growth to accelerate in the near term.

Figure 3: Forecasted growth in mobile payments



Source: John Heggstuen, THE PEER-TO-PEER PAYMENTS REPORT, 2015: The exploding market for smartphone apps that transfer money, Business Insider
<http://uk.businessinsider.com/growth-in-peer-to-peer-payment-apps-report-2015-4?r=US&IR=T>

One service called Paym uses the UK’s Faster Payments infrastructure to enable customers of many UK banks to make payments directly to each other’s accounts. The launch of Paym reflects the comparatively consolidated nature of the UK retail banking market.

For the moment, the impact of mobile capabilities has been much smaller in the corporate and wholesale payments sector, reflecting greater concerns around security and the need for more complex information to accompany transactions. But with the infiltration of smartphones into the payments world only expected to increase, this provides a viable opportunity for banks to adapt and consider solutions that cater to multi-device demands.

- **Foreign exchange and remittances**

FX is another area of payments being explored by an increasing number of new non-bank providers. Traditionally, organisations offering FX charged higher rates as a means of protection against exchange rate fluctuations, but technological innovation has enabled money to be exchanged in (near) real-time, reducing the

currency risk faced by banks and money transfer agencies. A number of alternative FX service providers have recognised this opportunity and entered the market, offering minimal costs and – in the instance of P2P business models such as WeSwap¹⁰ – enabling users to buy and sell currencies directly at an agreed rate.

This method of bypassing banking networks is undeniably efficient and the growing presence of non-bank providers should act as a trigger for banks to consider revisiting their FX strategies.

- **Real-time payments**

Consumers in retail banking are also benefitting from the development of payment systems that run in real-time rather than via the traditional (and relatively slow) method of batched processing. This in turn has fuelled further innovation, enabling consumers to conduct payments without the need for credit or bank cards; instead using service layers that run on top of existing real-time payment infrastructures (e.g., the UK's Zapp, which runs on top of the Faster Payments service).

The movement to real-time payments poses serious technical challenges to the global banking infrastructure, specifically linkages to anti-money laundering (AML) and reporting databases, as well as customer accounts payable/receivable and reconciliation.

Yet with new entrants to the payments sector typically launching with real-time payments models (consider PayPal), and with clients coming to expect and demand such high standards, any failure to provide real-time payments in the long-term would leave a bank vulnerable to competition.

That said, such “faster payment” schemes have been enabled by the introduction of ISO 20022 and XML standards, making it much easier for banks to work together on common approaches and thereby defend their ground. Indeed, a growing number of countries are exploring real-time solutions (see figure 4), making it easier for banks to meet customer expectations.

Figure 4: Countries that have introduced real time payments solutions



Source: Global Emergence of Real-Time Payments, 2014, VocaLink <http://immediatepayments.vocalink.com/>

For example, MyBank is a pan-European payment authorisation solution (operated by EBA Clearing) that enables users to authorise payments via the online banking portal of their own bank on either a domestic or pan-European basis.

While such cross-border real-time payments initiatives are likely to grow in number and size, the implementation complexity of previous harmonisation schemes (such as SEPA) indicates that building new payment platforms across international jurisdictions could yet pose a significant challenge.

- **Digital currency solutions**

Digital or cyber-currencies provide an alternative to traditional “fiat” (non-commodity-backed) currency as a store and transmitter of value. Bitcoin is the most well-known, using a P2P structure that facilitates transactions between parties without the need for an intermediary. As payments are made, changes in the ownership of the Bitcoin are recorded on what is known as the blockchain, with a block added to the blockchain when users spend Bitcoin¹¹ (see “Digital currency-based solutions” on page 10 within the Wholesale and Corporate Payments section for further details).

The Bitcoin payment infrastructure operates by converting in and out of fiat currency, and incurs much lower fees than traditional credit card-based transactions. Yet with the majority of solutions currently requiring consumers to explicitly buy and sell Bitcoin or other digital currencies, this creates a substantial barrier to adoption.

10 <http://www.ft.com/cms/s/0/92da2498-8a9d-11e3-ba54-00144feab7de.html#axzz3hlkNGvhG>

11 Double spending results from money being spent more than once. Bitcoin addresses the issue through the use of a decentralised ledger.

6 Wholesale and Corporate Payments

Industry changes can have a huge impact on payments innovation and it is this that is largely driving developments in the wholesale and corporate payments sector. Indeed, it must not be forgotten that in the midst of the technology advancements impacting the retail space, the wholesale and corporate banking industry itself has been evolving.

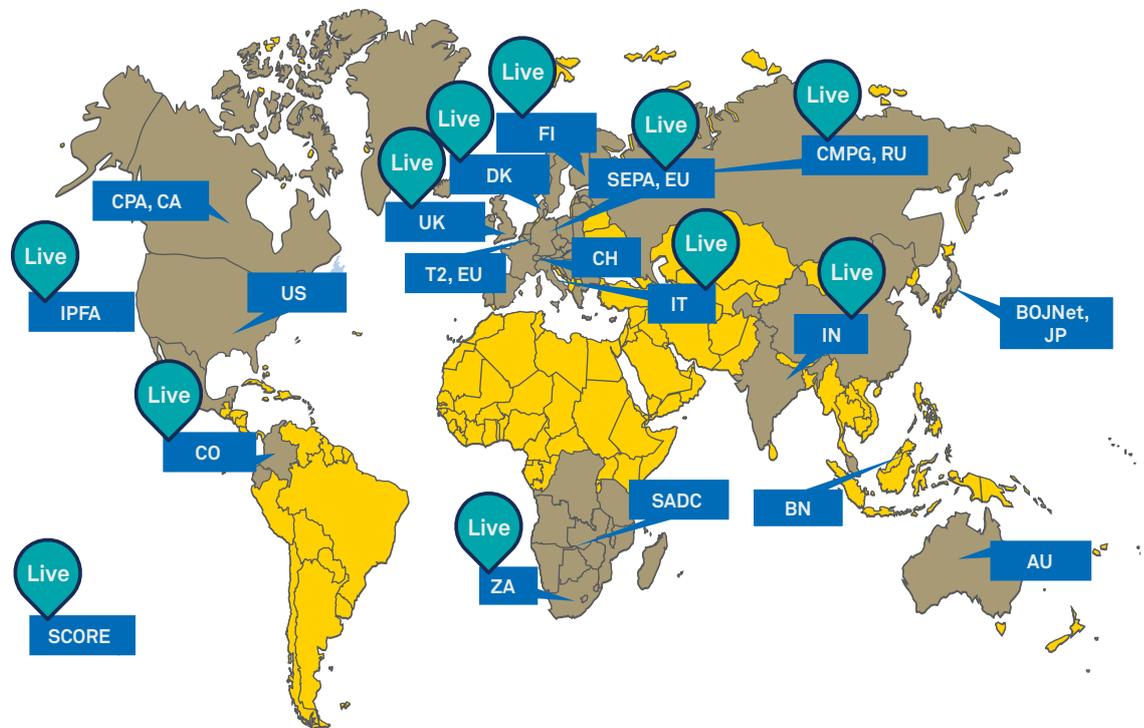
- Harmonisation of standards and markets**

For one, globalisation of the payments industry is being facilitated by various international agreements and bodies looking to encourage standardisation. Among these initiatives are the International Payments Framework (between the USA and Europe), the China International Payments System (CIPS), and SEPA and TARGET2-Securities¹² (T2S) in Europe. T2S, for example, is a single pan-European settlement platform designed to address Europe's fragmented settlements infrastructure, creating integration and reducing the associated complexities of working across

national boundaries. T2S also aims to reduce cross-border transaction costs, and its real-time settlement capabilities will minimise post-trade risk. Other benefits include enhanced settlement efficiency and liquidity management services.¹³ By way of illustration, BNY Mellon's decision to become a Directly Connected Participant on T2S in a selection of European markets means BNY Mellon can offer clients the suite of improvements available through the new initiative. And further to its existing direct connection in Germany and the Netherlands, by opening accounts directly at the Central Securities Depositories in Belgium, France, Italy and Spain, BNY Mellon will be able to settle over 90% of its European transactions directly on T2S.

In addition, the introduction of ISO 20022¹⁴ (see figure 5) and associated XML and ASN.1 standards have provided a common language for banks' and payment providers' systems to communicate, markedly increasing process efficiency.

Figure 5: Global ISO 20022 adoption by Payment Market Infrastructures



Source: Financial Market Infrastructures' Adoption of ISO 20022 by Country, SWIFT, September 2015

¹² T2S is a European securities settlement engine which aims to integrate and harmonise Europe's settlement infrastructure, which like SEPA, will bring the European Union closer to a common market. Central securities depositories will migrate in four waves between June 2015 and February 2017.

¹³ https://www.ecb.europa.eu/paym/t2s/pdf/specser/T2S_SpecialSeries_final_01.pdf

¹⁴ ISO 20022 is a messaging standard for financial services providing a metadata repository containing descriptions of messages and business processes.

The establishment of these common standards is an important enabler in the growth of local and global payments infrastructures. Common standards have also enabled more modular approaches to IT, in which new services can be plugged into existing systems without the need for complex intermediary layers.

- **Bank Payment Hubs**

Some banks are implementing bank payment hubs (BPHs) as a means of updating clunky legacy infrastructure. A BPH brings together different elements of banks' payment systems, enabling the better-management of payment flows and improving flexibility, thereby allowing banks to respond more easily and quickly to changing demands and market conditions. The adoption of a common platform allows ancillary services such as AML to be integrated at an organisation-wide level, as well as supplying a more open platform upon which new services can readily be built (such as value-adding cash management services). Payment hubs also leave banks better placed to handle the demands of faster payments and risk management systems.

A BPH's integration of payments data also enables banks to move away from siloed information toward a single customer view. Certainly, the increased transparency and availability of data is extremely valuable, and can add value to both banks and end-client businesses in terms of process management, cash management and cost savings.

Furthermore, BPHs move banks' payment systems to industry standard messaging, enabling them to connect more seamlessly with outside channels and partners.

While the benefits of a BPH are clear, the implementation of such a structure is complex and brings with it substantial risk given the complexity of implementation and the central role of payments to the majority of banks. This is not a strategy to be adopted without careful

consideration, yet the process has been alleviated somewhat by the introduction of software layers (yet another example of recent innovation), which allow individual system components to feed separately into the core system.

- **Supply chain finance (SCF)**

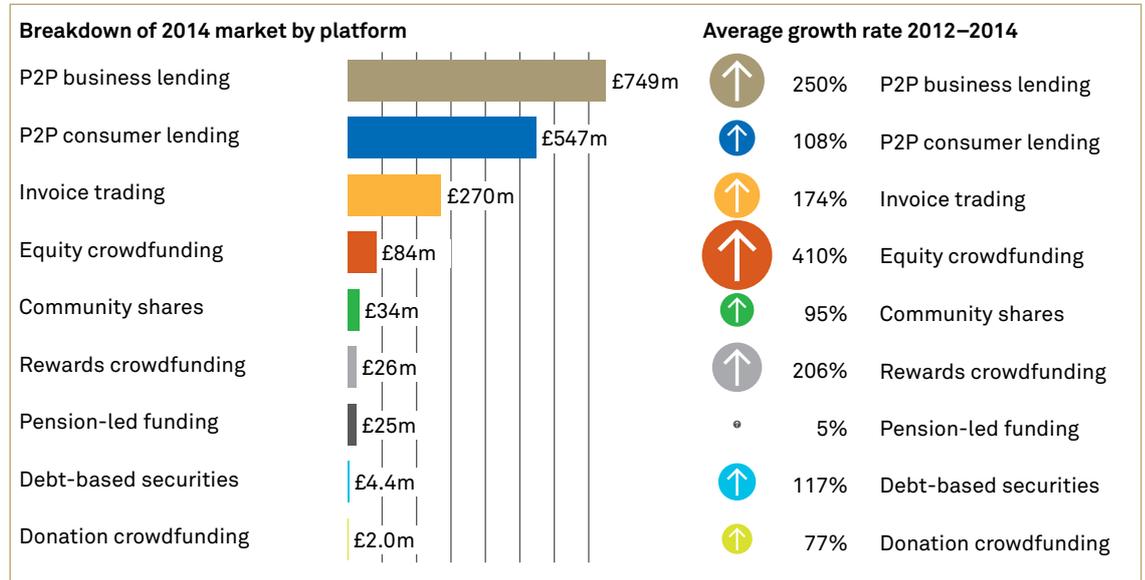
Today's era of true globalisation sees businesses exploring and establishing relationships with an increasingly disparate selection of buyers and suppliers (with markedly different financial set-ups) across the globe. This, combined with technology capabilities that significantly enhance supply-chain transparency, is helping to create a plethora of opportunity in the field of SCF, resulting in substantial growth in usage and product development.

SCF provides an invaluable opportunity to strengthen relations with suppliers; something that is all the more important when dealing with far-flung trading partners in times of socio-economic change. Recent innovations, such as reverse factoring, look to optimise the utilisation of working capital within the supply chain, creating mutually-beneficial arrangements between buyers and suppliers. Alternatively, dynamic discounting can enable buyers and suppliers to negotiate payment terms and discounts; a particularly attractive method when buyers have capital available that can be redeployed to suppliers in exchange for better trading terms.

- **Non-traditional lending**

The global financial crisis compounded the difficulties many small and medium enterprises (SMEs) faced in obtaining finance, providing fertile ground for the growth of a range of non-traditional channels. Alternative lending is now a well-established sector (see figure 6), extending credit to SMEs by deploying alternative data sources and using new sources of capital.

Figure 6: Size and growth of alternative finance categories



Source: Understanding Alternative Finance: The UK Alternative Finance Industry Report 2014, Nesta-Cambridge 2014
<https://www.nesta.org.uk/sites/default/files/understanding-alternative-finance-2014.pdf>

A variety of business models have emerged to address this niche, including new form lending (which bases credit decisions on near real-time cash-flow data, giving a clearer view of a business’s health than can be obtained from historical business records). Specialist providers are often able to offer more user-friendly, competitively-priced solutions, potentially eroding the market position of banks.

● **Digital currency-based solutions**

The impact and usage of digital currencies on wholesale payments have been far less noticeable than in the retail payments sector, yet this is likely to change as cryptocurrencies become viewed less as stores of value and more as means of reducing friction within the payments process.

The potential that Bitcoin’s infrastructure, the blockchain, could hold for corporate and wholesale payments is becoming increasingly of interest. The blockchain is a cryptographic, decentralised record of each step of every transaction made, which can be accessed by any computer within the Bitcoin network. This means information is transparent (allowing the entire transaction – and therefore, ultimately, ownership – to be tracked), yet protected and unable to be changed.

Indeed, while it is possible that the Bitcoin may not succeed in the long-term as a cryptocurrency, it is the technology behind it – the blockchain – that is the real innovation, which a growing number of banks (including BNY Mellon) believe may be effectively leveraged to transform payments. The structure of the blockchain could, for instance, help to reduce risk and transaction costs, and improve speed, efficiency and transparency.

Of course, Bitcoin was designed to enable the transfer of value through the movement of Bitcoin alone, so the blockchain does not currently support direct fiat currency transactions. A range of solutions is therefore being developed that build upon the Bitcoin infrastructure, and there is also a range of alternative digital currencies either available or soon to be launched, known as Bitcoin add-ons or “altcoins” (alternative cryptocurrencies), based on blockchain principles,¹⁵ that more specifically target opportunities in the wholesale payments market.

Ripple, for example, is positioning itself as a layer on which remittances and currency exchanges can take place without the need for international settlements. An innately appealing solution, this concept could even become a

15 <http://gandal.me/2014/06/10/a-decentralized-securities-trading-and-settlement-system-is-being-built-hidden-in-plain-sight/>

challenger to the role currently filled by SWIFT and SEPA.¹⁶ So far, Fidor Bank, Cross River Bank and CBW Bank have signed up to use Ripple for real-time settlement of cross-border money transfers.¹⁷

Another recent development has been the indications made by central banks in the UK and US that digital versions of fiat currencies are under consideration, and could be regarded part of the countries' respective money supplies.¹⁸ A Bank of England discussion paper released in February 2015 envisioned cryptocurrencies as a new way of undertaking interbank settlement and enabling transactions directly between participants without a financial intermediary.¹⁹

Other innovations have seen provision made for the incorporation of smart contracts²⁰ into or on top of digital currencies. This could see digital currencies become a key element in a range of financial services. Potential functionality could include a means for the ownership of goods to be listed on the blockchain. Independent agents could then execute functions without the need for intermediaries and – even more interestingly – without the need for a central clearing house.²¹

More of these initiatives are likely to emerge as banks look to take advantage of the robustness, efficiency and transparency of the blockchain. IBM, Barclays and UBS, for instance, have recently declared their own exploration of digital currency-based initiatives.

There remains considerable uncertainty in many markets over the future regulatory environment for Bitcoin, with regulators facing questions on whether digital currencies represent what one would consider a currency (treated like foreign currency), commodity (treated like goods), surrogate money (not recognised by the state) or a form requiring a whole new financial paradigm.²² On top of this there is likely to be a need for a wider ecosystem of messaging standards, risk management and applications, in order for such systems to succeed.

In addition, some countries are placing restrictions on (or even blocking) the use of Bitcoin due to concerns regarding its potential

(i.e. unregulated) use in money laundering and the purchase of illegal goods.²³ Bolivia, Ecuador and Iceland for example, have all banned the use of Bitcoin.

- **A move to cryptocurrency**

Cryptocurrency transactions would represent a big change for traditional banks, with the majority understandably adopting a “wait and see” or “fast follower” approach, reflecting the relatively unproven nature of the technology, particularly in the more complex domain of wholesale payments.

Indeed, blockchain technology presents a number of challenges that have yet to be resolved, such as managing the ever-increasing length of the chain itself (a problem referred to as “blockchain bloat”), as well as how banks can reconcile the blockchain's use of pseudonyms (used as a means of ensuring anonymity) with regulators' requirements for transparency.

So while there is clearly a great deal of potential around the blockchain, the exploration of the applicability of such technology to global corporate transactions is still in its infancy.

- **Competitors**

The sweeping changes witnessed in the retail and consumer payments market have had a far less pronounced impact on wholesale and corporate payments, yet there is growing recognition of the potential for disruption driven by fintech players.

This disruption could come in two forms. Firstly, larger technology providers within financial services – such as FIS and Fiserv, whose role has traditionally been to provide the tools with which banks operate – could become more active direct participants. As we move to a wholesale payments world that is more technology-driven, there will be opportunity for such organisations to have more direct involvement with payments – particularly if they align with the right organisations.

Furthermore, there is also a growing number of new banking platform providers emerging, such as BAML and Aveloq, offering “plug

16 <https://medium.com/decentralize-everything/bitcoinference-2015-why-do-banks-prefer-ripple-over-bitcoin-77f1544a0f82>

17 <http://www.finextra.com/news/fullstory.aspx?newsitemid=26491>

18 <http://www.reuters.com/article/2015/03/12/us-bitcoin-ibm-idUSKBN0M82KB20150312>

19 <http://insidebitcoins.com/news/bank-of-england-on-bitcoin-considering-central-bank-issued-cryptocurrencies/30266>

20 Smart contracts are computer protocols that enable participants to facilitate, verify, execute and enforce the terms of a contract.

21 <http://coinbrief.net/smart-contracts-bitcoin/>

22 <http://www.thebitcoinchannel.com/archives/43274>

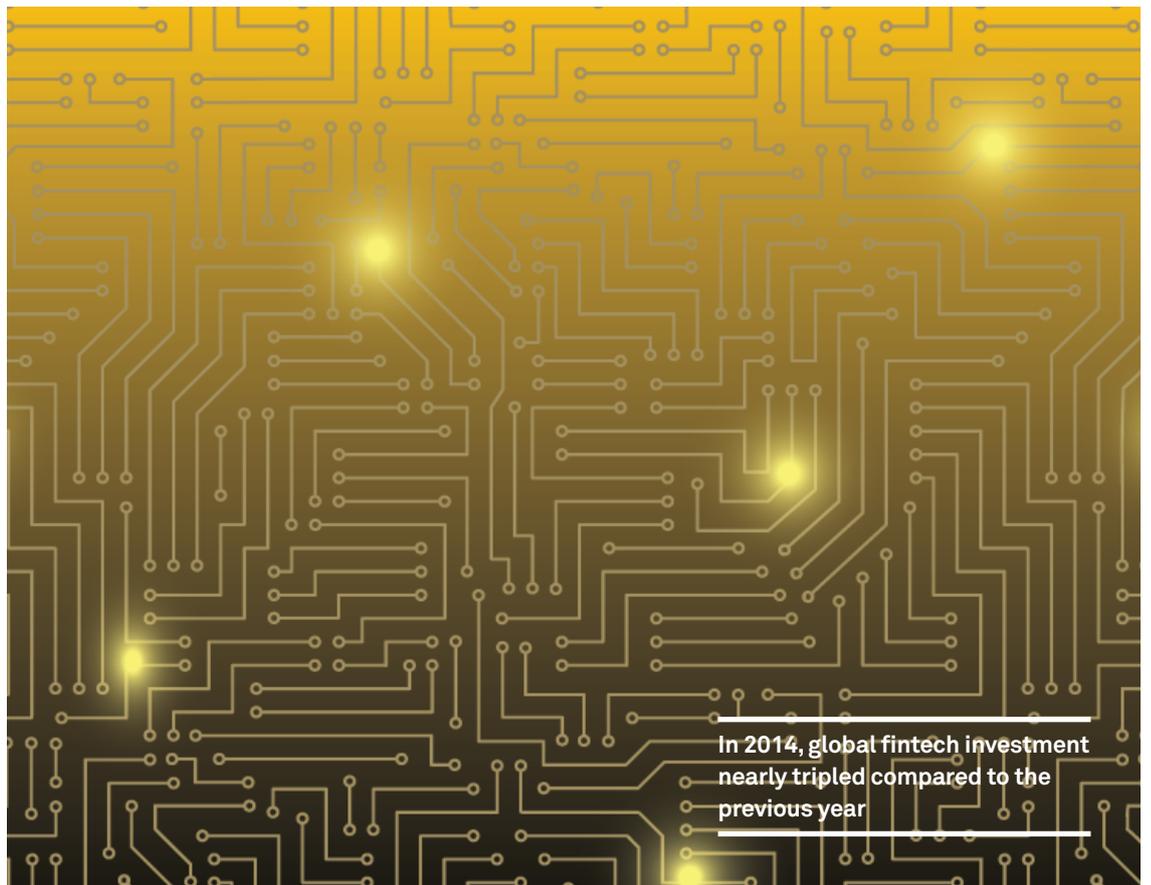
23 <http://www.coindesk.com/information/is-bitcoin-legal/>

and play” solutions; ready-made platforms capable of plugging into new systems, such as SEPA and Faster Payments. These platforms are extremely agile and market-adaptable, with the ability to effectively “unplug” from one method of processing when it becomes outdated and “plug into” another improved system, thereby substantially increasing the speed with which new solutions can be rolled out to market. There is a growing appetite for banks adopting such “vendor” platforms, rather than building entirely new platforms from scratch, and bank-vendor alliances in this area are increasing (such as RBS and Bottomline and BAML and Tieto).

Secondly, fintech start-ups will play a significant role in altering the wholesale payments space. Numerous start-ups have the potential for up-ending wholesale payments and driving disintermediation (particularly in the area of digital currencies), with business models that aim to reduce friction and the cost of transactions, in order to overhaul the payments

experience. Currently, such plans are largely under wraps as technologies and business models are refined, and it remains to be seen whether these players are able to gain a foothold, or create a sustainable business model in the long run, without partnering with more established players and thereby gaining access to banks’ payment infrastructure, expertise and existing client base.

While fintech start-ups and technology providers wield huge influence, they currently lack the scale, experience, established client trust and regulatory-backing – hallmarks of traditional banks – to truly dictate how the payments sector evolves. Indeed, while banks could view the crowded, rapidly evolving, technology-fuelled environment as an obstacle, the potential for change in the payments industry should be seen as positive, and should provide the incentive needed for banks to reassess their payments strategies and business models, to usher in a whole new payments era.



7 How are Banks Responding to Fintech?

Banks have always invested in the development of more sophisticated technology capabilities in order to improve payment operations and client service, reduce risk, lower costs and establish a competitive advantage. In fact, of all business sectors, the financial services industry has one of the highest ratios of IT spend as a proportion of revenue,²⁴ with levels expected to reach US\$196.7 billion in 2015 (up from US\$188.1 billion in 2014). That said, over three quarters of this expenditure is estimated to be on system maintenance rather than on the development of new services,²⁵ meaning a fresh approach is needed.

The period following the global financial crisis has seen many banks come under pressure to reduce spending on non-core functions, with much of their focus diverted to addressing regulation and compliance. Simultaneously, they are having to traverse a landscape not only comprised of an increasing number of new competitors, but a new *type* of competitor – which many view as better placed to respond to changing market regulations, conditions and customer demands.²⁶

Indeed, these non-bank players, free from legacy systems and the same level of regulation as banks, are able to dedicate greater focus and resources to developing attractive, user-friendly and easy-to-access solutions, and boast a “clean slate” upon which to experiment and introduce completely fresh products, using the latest technology, from scratch. Subsequently, start-ups can develop innovative products at a faster rate; a clear competitive challenge to the more traditional methods used by banks.

Yet, while banks have been somewhat absorbed by heightened levels of regulation, it is hugely important to remember that the resources and dedication that have been applied to adhering to new compliance demands have not been fruitless. Indeed, banks are in a far superior position to non-banks with regard to the level of security they can provide and their effective, efficient management of risk (including Know Your Customer “KYC” and AML processes). Such improved data transparency is extremely valuable, providing greater process visibility and enabling the digital management of data; vital components in helping to reduce transactional risk. Banks have always been highly regulated and have an ingrained reputation as the safe-keeper of society’s wealth, so although the infrastructure of the payments market is likely to change, the risk profile of the traditional banking sector is not.

Banks continue to uphold their reputation for reliability and transaction security and invest in meeting high regulatory standards, yet they also recognise the importance of being at the forefront of innovation and seek to leverage the huge advancements that fintech has the potential to unleash. This has led many to explore a number of approaches to tap into fintech innovation, including:

- Venture capital investment,
- Accelerator/incubator programmes,
- And close collaboration with the fintech community.

Venture capital-style investment – while not directly solving the problem of integrating new innovations into organisations’ operations – provides the opportunity for banks and other organisations to be part of the digital action. Examples include:

- Santander’s Innoventures; a US\$100 million fintech venture capital fund based in London,
- HSBC’s creation of a US\$200 million fund targeted at the fintech sector, focusing on both retail and wholesale banking markets with the aim of improving its technology systems,
- Sberbank’s SBT Venture Capital; a US\$100 million fund for the fintech sector, providing finance and support in return for insight and potential collaboration.

Europe and the Middle East boast a growing collection of specialist fintech accelerators, where the relationship with banks ranges from partner/sponsor models to more active ownership/manager structures, where start-ups are often expected to integrate into sponsor’s systems. Examples include:

- The FinTech Innovation Lab, which provides a mentor programme and looks to foster relationships between start-ups and major banks, currently in London, New York, Hong

24 <http://www.dotain.com/Gartner.pdf>

25 <http://thetally.efinancialnews.com/2015/02/fn-fintech-focus-much-banks-spend-new-tech-investments/>

26 http://www.cognizant.com/InsightsWhitepapers/the_changing_face_of_payments-report_2014_final.pdf

Kong and Dublin. The scheme is managed by Accenture, but also has partnership arrangements with Credit Suisse, Goldman Sachs, J. P. Morgan and Lloyds Banking Group, amongst others,

- The Barclays Accelerator Programme; a London-based incubator scheme providing fintech start-ups with funding, office space and access to Barclays' APIs and data,
- The Plug and Play Fintech Programme; a partnership between Citi's global corporate venturing arm, Citi Ventures, and Californian accelerator Plug and Play, with locations in the US, Germany, Singapore, Brazil and Spain. The bank has also created the Citi Accelerator Programme in Tel Aviv, providing a four month incubation process with mentoring, product development support and access to senior executives at Citibank,
- Last but not least, Level39 in London's Canary Wharf, whilst not having direct relations with financial institutions (FIs), acts as the provider of acceleration space to some of Europe's most high-profile fintech firms.

There are also numerous initiatives that don't fit into the venture capital or accelerator sponsorship category of bank-fintech collaboration. These programmes range from large-scale internally-directed innovation programmes, through to standalone "hackathon"-type initiatives, with limited impact on the internal workings of the sponsoring organisation. These include:

- Blockchain Innovation Lab; launched by UBS in London's Level39 accelerator space with the aim of collaborating with the wider fintech community,
- MyIdea, set up by BNY Mellon to provide a platform where employees can pitch ideas and enter competitions to improve business areas,
- RBS's initiative to station staff in Silicon Valley to track developments as well as provide office space for UK start-ups setting up in the area,
- And a 36-hour hackathon launched by Bank Leumi, LeumiTech and Salesforce in Tel Aviv, with the aim of developing applications within the fintech space.

Not all banks have chosen to publicise their initiatives, which means there are likely to be numerous other projects in development.

Bank-fintech partnerships are an effective way for banks to gain real access and insights into the world of pioneering digital innovation; positioning them at the very core of the industry that is redefining payments. Yet both parties bring significant strengths to the table, and fintech start-ups are very receptive to receiving support and investment from banks to help them develop and realise their visions. Indeed, while fintechs bring in-depth technology know-how and expertise – as well as increased speed of design and manufacture – banks' knowledge of the intricacies and practicalities of functioning payment systems and whether new concepts could be realistically applied to the payments space is unrivalled. For example, banks will be able to offer guidance regarding regulatory requirements and security standards – an area that fintechs have very little knowledge of. Last but not least, banks currently have access to a far larger pool of clients than fintechs.

Through reciprocal engagement and support, both banks and fintech companies have the potential to successfully reengineer the nature of payments. While this might be a somewhat unnerving concept for traditional banks, change is coming, and banks need to ensure they are firmly in the driver's seat when this happens.

BNY Mellon is strongly immersed in the fintech sector and is investing a great deal of time and focus on exploring the potential it has to offer the global payments arena. Following initial engagement with the fintech community at the beginning of 2014, BNY Mellon has been able to develop strong relationships with key fintech players and establish a fintech strategy. Elements of BNY Mellon's fintech innovation strategy include:

- **Identifying opportunities.** Through close collaboration with the fintech community, BNY Mellon has identified specific areas of interest that have the potential to reengineer payments, including blockchain and big data technology. In fact, the blockchain concept could be applied to any digital asset, such as security, bonds, loans and collateral, and could therefore be applicable to a number of settlement activities

beyond payments. BNY Mellon is therefore working with companies to understand the possible capabilities of the blockchain, as well as distributed ledger concepts, to see how the software could be used to make transactions more efficient and how it could become a tangible business concept.

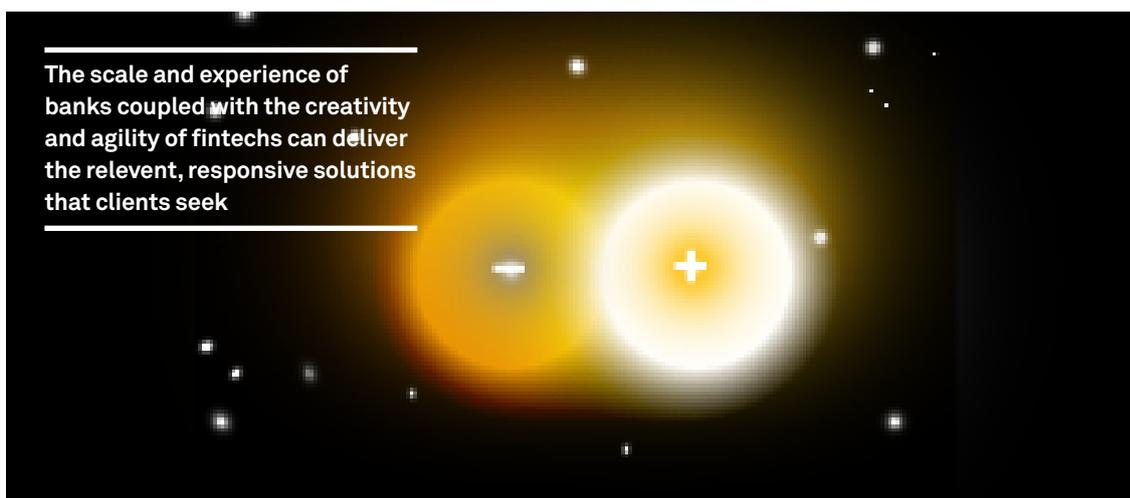
- **Proof of concept.** By working closely with two fintech firms in particular, BNY Mellon is exploring the use of new technology capabilities within a safe, test environment. The goal of these two working relationships is to learn how the technology works, where improvements need to be made and how it could be applied to a functioning global payments system. It is important, for example, to identify whether a new concept addresses key value-adding elements (such as reducing risk and costs; increasing transparency and speed).

Taking this a step further, were transformational technology developments to gain traction and advance to a sufficient stage, the proof of concept approach would need to be applied on a larger scale, with banks working together as a network to explore the practical application of proposed technology capabilities.

- **Strategic review.** The sheer number of fintech start-ups looking to add value to the payments space can make it difficult for banks to know where to invest. It is therefore important for banks to understand their objective and establish a “fintech profile” before embarking on specific partnerships. It is also beneficial for fintechs to have some knowledge and understanding of the applications they are trying to enhance, as many concepts can fall at the first hurdle if they aren’t able to realistically mould into the established financial world.

- **Innovation centres.** As part of BNY Mellon’s commitment to become the financial industry’s technology leader, the company has established innovation centres across the world that use emerging and disruptive technologies to gain new business insights. The company’s fifth and newest global innovation centre is soon to launch in London, England with four other centres operating in Silicon Valley, California; Jersey City, New Jersey; and Pune and Chennai, India. The mission for all the centres is to encourage collaborative, breakthrough thinking that will leverage talent development and lead to innovations for clients. The centres are also a platform for employees to share ideas that encourage dialogue, creativity and collaboration with colleagues across the world.
- **Fintech events.** BNY Mellon hosted a three-day TechExpo event in London to showcase various technology solutions. BNY Mellon is also actively engaged with universities and start-ups, sponsoring programmes such as Accelerate Cambridge at the Judge Business School, Cambridge University. These accelerator events are designed to encourage creative thinking and aim to help transform promising ideas into viable businesses through engagement and investment. BNY Mellon has also hosted start-up weekends, pitching and drop-in days for fledgling fintechs (such as the Digital Payments Revolution event).
- **“Level 42”.** BNY Mellon works closely with a network of start-ups based on Level 42 of One Canada Square in Canary Wharf, London, to help foster a true innovation culture.

The scale and experience of banks coupled with the creativity and agility of fintechs can deliver the relevant, responsive solutions that clients seek



8 Recommendations

The vast majority of change brought about by fintech innovation has yet to hit the wholesale and corporate payments space, but start-ups are now emerging that have the potential to transform payments and the industry itself. As the pace of change accelerates, banks – while not necessarily required to lead the way in terms of innovation – must engage with the fintech community in order to better understand future challenges and opportunities. By doing so, banks can position themselves firmly in the mix of this digital race. Historically banks have been the nerve-centre and backbone of payments, but if their stance is too passive they risk being left behind, with the payments crown going elsewhere.

To “future-proof” payments strategies, banks should consider:

- **Developing and publishing an internal “road map”** outlining how to identify and respond to market threats and opportunities,
- Identifying opportunities to strengthen business through proactive **innovation** (e.g., redeploying consumer payments infrastructure for corporate payments),
- **Meeting and engaging with nimble fintech start-ups** within the digital payments sector to gain knowledge and better understanding of potential developments in the payments space, through events such as innovation slams with fintech companies, clients and internal stakeholders. Dialogue and involvement with the fintech world can be an ideal way for banks to explore and gain direct exposure to the technology innovation scene,
- **Conducting ongoing research** to keep abreast of fintech-driven changes within the sector. Whilst the complex nature of wholesale and corporate payments markets means major change is unlikely to happen in the short-term (12-18 months), banks need to be sufficiently forward-looking to ably respond to market changes in the medium-term (18 months to four years). Banks are not known for their agility, and early warnings will ensure they are able to choose the most appropriate strategy (partnership, acquisition, product development etc.),
- Ensuring **key staff are educated** on developments, threats and opportunities in the payments business. Digital currencies and the blockchain in particular have the potential to significantly shake up payments, and vigilance in this area is necessary to ensure banks are not caught “on the back foot” and remain relevant, prepared and proactive,
- **Offering closed sessions/workshops** to senior management, where issues and opportunities arising from fintech innovations can be safely explained, discussed and explored in a supportive environment (i.e. “no stupid questions”),
- **Developing an innovation programme** in partnership with IT, enabling the prototype of new initiatives to be tested in a “safe to fail” environment,
- **Optimising information and data** already available within banking systems. Patterns and trends in client preferences and behaviour can be identified and analysed (due to enhanced technology and transparency capabilities) to not only offer far better client service (such as through improved efficiency and effectiveness of banks’ own operations), but to generate real added-value to both banks and their clients,
- **Adopting a payments hub** to equip banks with a flexible IT infrastructure that is more malleable and better able to adapt to changing market needs than existing legacy systems.

9 Conclusion

The payments sector is in the midst of rapid evolution, driven by a sharp uptick in innovation, changing patterns in consumer consumption and a number of industry initiatives and shifts in market conditions.

New technology in particular has both enabled and in turn been fuelled by a huge influx of new providers and products, all vying to enter the payments space. This has contributed to an element of “unbundling” of financial services, with previously comparatively-sheltered business sectors (such as in FX) increasingly exposed to growing competition, and with non-banks offering attractive, cost-saving solutions that aim to provide better overall experiences for clients.

This potentially distances banks from clients and their transaction data, just as data itself becomes an increasingly important market differentiator, thanks to the insights that can be gleaned through big data analysis. Furthermore, the recent wave of heightened regulatory requirements has absorbed bank focus and resources, impacting their innovation agility in this tech-fuelled environment and placing them at a disadvantage in the race to introduce new and improved products to market. In addition, bank legacy systems were designed to be robust rather than flexible, meaning their capacity to accommodate emerging and unforeseen technology advancements can be limited.

Yet systems such as bank payment hubs are now enabling banking infrastructure to become more in-line with contemporary approaches to software development, allowing the necessary flexibility to adapt to the market without impairing data and payment security and reliability.

Technology innovation focused on the SME market has been particularly active (spurred by the impact of the financial crisis), giving rise to the emergence and growing popularity of non-traditional forms of finance such as SCF and P2P lending. A growing number of fintech start-ups are also enabling SMEs to access payment services that were previously the domain of large corporates.

With banks increasingly aware that fintech and the developments occurring in retail payments wield enormous influence over the future path of corporate payments, the payments space is evolving rapidly as traditional players and fintech pioneers establish collaborative partnerships to leverage the

best elements of both parties, and thereby deliver unrivalled optimal solutions to clients.

Still in their nascency, digital currency processes could yet have the largest impact on corporate payments, with Bitcoin and the blockchain providing a model for a more friction-free payment processing environment.

Blockchain technology is presenting a very rare opportunity to address current payment constraints. And were the challenges of making blockchain technology a tangible concept overcome, banks and fintech companies could radically transform global payments. Not only would systems have far more capabilities, developing countries would have greater access to financial services, therefore benefitting society as a whole. Indeed, by leveraging such technology to make cross-border payments immediate, cost-effective, completely transparent and risk free from a regulatory perspective, payments will become truly revolutionised. Blockchain technology has the potential to unleash this new payments world, so start-ups, venture capitalists and banks have all begun to invest in digital currency-based solutions for wholesale transactions. Details of these solutions largely remain undisclosed, however, and will require the support of a complex range of stakeholders if they are to have a real chance of succeeding.

In light of this fundamental sea-change in the payments business, banks must not just understand, but harness the power of fintech. While a great deal of uncertainty remains regarding the timing and exact direction of future changes around payments, one thing is clear: fintech will radically redefine the payments landscape, and has the potential to leave banks behind if they fail to react.

While such an overhaul of this largely ingrained, traditional sector may seem daunting and unsettling for banks, adopting a fintech-friendly strategy in a timely manner can propel banks into the digital world and position them at the centre of this exciting environment, ultimately enabling them to provide relevant, user-friendly solutions that present real value and meet the evolving needs of their clients.

bnymellon.com

BNY Mellon is the corporate brand of The Bank of New York Mellon Corporation and may be used as a generic term to reference the corporation as a whole and/or its various subsidiaries generally. This material and any products and services may be issued or provided under various brand names in various countries by duly authorised and regulated subsidiaries, affiliates, and joint ventures of BNY Mellon, which may include any of the following. The Bank of New York Mellon, 225 Liberty Street, New York, New York 10286 USA, a banking corporation organised pursuant to the laws of the State of New York, and operating in England through its branch at One Canada Square, London E14 5AL, England, registered in England and Wales with numbers FC005522 and BR000818. The Bank of New York Mellon is supervised and regulated by the New York State Department of Financial Services and the US Federal Reserve and authorised by the Prudential Regulation Authority. The Bank of New York Mellon, London Branch is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request. The Bank of New York Mellon SA/NV, a Belgian public limited liability company, with company number 0806.743.159, whose registered office is at 46 Rue Montoyerstraat, B-1000 Brussels, Belgium, authorised and regulated as a significant credit institution by the European Central Bank (ECB), under the prudential supervision of the National Bank of Belgium (NBB) and under the supervision of the Belgian Financial Services and Markets Authority (FSMA) for conduct of business rules, and a subsidiary of The Bank of New York Mellon. The Bank of New York Mellon SA/NV operates in England through its branch at 160 Queen Victoria Street, London EC4V 4LA and is registered in England and Wales with numbers FC029379 and BR014361. The Bank of New York Mellon SA/NV (London Branch), authorised by the ECB, NBB and the FSMA and subject to limited regulation by the Financial Conduct Authority and the Prudential Regulation Authority. Details about the extent of our regulation by the Financial Conduct Authority and Prudential Regulation Authority are available from us on request. The Bank of New York Mellon, Singapore Branch, subject to regulation by the Monetary Authority of Singapore. The Bank of New York Mellon, Hong Kong Branch, subject to regulation by the Hong Kong Monetary Authority and the Securities & Futures Commission of Hong Kong. The Bank of New York Mellon Securities Company Japan Ltd, which acts as intermediary for The Bank of New York Mellon. Not all products and services are offered in all countries.

The material contained in this document, which may be considered advertising, is for general information and reference purposes only and is not intended to provide legal, tax, accounting, investment, financial or other professional advice on any matter, and is not to be used as such. Information contained in this document obtained from third part sources has not been independently verified by BNY Mellon, which does not guarantee the completeness or accuracy of such information. The contents may not be comprehensive or up-to-date, and BNY Mellon will not be responsible for updating any information contained within this document. If distributed in the UK or EMEA, this document is a financial promotion. This document and the statements contained herein, are not an offer or solicitation to buy or sell any products (including financial products) or services or to participate in any particular strategy mentioned and should not be construed as such. This document is not intended for distribution to, or use by, any person or entity in any jurisdiction or country in which such distribution or use would be contrary to local law or regulation. Similarly, this document may not be distributed or used for the purpose of offers or solicitations in any jurisdiction or in any circumstances in which such offers or solicitations are unlawful or not authorised, or where there would be, by virtue of such distribution, new or additional registration requirements. Persons into whose possession this document comes are required to inform themselves about and to observe any restrictions that apply to the distribution of this document in their jurisdiction. The information contained in this document is for use by wholesale clients only and is not to be relied upon by retail clients.

Reproduction, distribution, republication and retransmission of material contained in this document is prohibited without the prior consent of BNY Mellon. Trademarks, service marks and logos belong to their respective owners.

© 2015 The Bank of New York Mellon Corporation. All rights reserved.

10/2015. T3015



BNY MELLON