Mark Carney: Enabling the FinTech transformation – revolution, restoration, or reformation?

Speech by Mr Mark Carney, Governor of the Bank of England and Chairman of the Financial Stability Board, at the Lord Mayor's Banquet for Bankers and Merchants of the City of London, Mansion House, London, 16 June 2016.

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Given the tragic murder of Jo Cox MP on 16 June, at the Mansion House dinner in lieu of this speech, the Governor paid tribute to Ms Cox and the highest standards of public service she represented throughout her life.

1. Introduction

My Lord Mayor, Chancellor, My Lords, Ladies and Gentlemen.

Let me begin by thanking Andrew Bailey for his outstanding record of public service during his 31 years at the Bank of England.

Andrew is an extraordinary public servant who has devoted his entire professional life to serving the people of the United Kingdom. During his career, he has worked across all of the Bank's policy areas, combining leadership and innovation to deliver consistently the Bank's policy objectives. His work in helping to manage the crisis and then to develop the post-crisis regulatory framework has been exemplary. He has made the Prudential Regulation Authority (PRA) a highly respected and effective regulator and built a team of exceptionally dedicated colleagues. I would like to thank Andrew for his counsel and support since I joined the Bank and wish him every success in steering the Financial Conduct Authority (FCA) at this vital time in its history. I admire his commitment to ensuring the UK's financial system serves its real economy and I look forward to continuing to work closely with him in future.

Although the Bank has placed itself in purdah, its duties never cease. The people of the United Kingdom, via parliament, have conferred tremendous responsibilities on the Bank. These remits must be pursued continuously, independently and transparently.

The independence of the Bank of England is at the heart of the integrity of the financial system. And the Bank's independent conduct of monetary policy is vital to ensuring price stability and to support strong, sustainable and balanced growth across the United Kingdom.

Transparency is the hallmark of modern central banking and democratic accountability.

Today, consistent with its statutory responsibilities, the nine-member independent Monetary Policy Committee (MPC) announced its latest monetary policy decision.

The published minutes of that meeting contain, as they should, carefully calibrated and precisely worded descriptions of the MPC's deliberations, the adjustments to our outlook, including our assessment of the major risks to the economy. The minutes also note some of the wide range of contingency plans the Bank has put in place to support market functioning and financial stability around the referendum.

If you have not already done so, I recommend you read them.

Let me move from the short term to the medium term. For there is more than a whiff of revolution in the air.

2. The promise of FinTech

Bliss was it in that dawn to be alive; but to be young was very heaven!

To its advocates, the wave of innovation sweeping through the world of financial technology promises nothing short of revolution. 'FinTech' heralds the dawn of narrow banking and portfolio optimisation. It will change the nature of money,[1] shake the foundations of central banking and deliver nothing less than a democratic revolution for all who use financial services.

Revolutions are not always abrupt, and sometimes their origins remain obscure.

In noting the possibilities at the start of the Twentieth century, Keynes remarked that "the inhabitant of London could order by telephone, sipping his morning tea in bed … the various products of the whole earth … adventure his wealth in the natural resources and new enterprises of any quarter of the world…; [or] decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend…"

Such global portfolio management was made possible by technological developments stretching back decades, ranging from the 'pantelegraph' of the 1860s – capable of transmitting signatures to verify bank deposits – to the cable buried deep beneath the Atlantic that could transmit eight words a minute. Such remote trade confirmation and low latency that made the *Flash Boys* of the day possible.

The financial globalisation these innovations enabled was built on a much earlier, simpler, and more profoundly transformational development: the ledger. For there is no finance without the ability to record transactions, balances, and obligations.

Money and credit, the universal instruments of commerce, could not exist without this most fundamental of financial technologies, which allows debits and credits to be netted off; debt to circulate as currency; money to replace memory; and with it, trade to expand exponentially.

How much have we progressed since Keynes' bed-ridden globalisation?

Replace "telephone" with a "tablet" and "tea" with a "soy latteccino" and you have not the start of the Twentieth Century but the Twenty First, a century in which opportunities are no longer limited to men or denizens of the City. Nonetheless, finance continues to be arranged around a series of hubs like brokers, clearing houses and exchanges; whereas, in other domains, people form connections directly, instantaneously and openly, and this is revolutionising how they consume, work, and communicate.

The extent to which finance continues democratising and transforming depends on superficially arcane, but fundamentally vital, enabling technologies. The emergence of mobile telephony, the ubiquity of the internet, availability of high-speed computing, advances in cryptography, and innovations in machine learning could combine to enable rapid changes in finance – just as they have in other areas of the economy.

The ledger, once stone, wood, or paper – and always centralised – is now digital and may become distributed. FinTech has the potential to deliver more resilient financial infrastructure, more effective trade and settlement, and new ways to encode, share and analyse data.

For the financial sector, these could offer shorter, speedier transaction chains; greater capital efficiency; and stronger operational resilience. For consumers, they could mean more choice; better-targeted services; and keener pricing. For everyone, FinTech may deliver a more inclusive financial system, domestically and globally; with people better connected, more informed and increasingly empowered.[2]

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[1] Especially the balance between inside money (created by commercial banks) and outside money (created by central banks).

[2] FinTech could play a role in helping to address a worrying decline in the provision of correspondent banking services which support cross-border payment and settlement. Half of emerging market and developing economy jurisdictions, three quarters of large banks and a majority of local and regional respondent banks recently reported a decline in such services. Know-your-customer utilities and potentially distributed ledger technologies

These benefits spring from FinTech's potential to deliver a great unbundling of banking into its core functions of settling payments, performing maturity transformation, sharing risk and allocating capital. This would mean *revolution*, fundamentally re-shaping the financial system.

At the same time, some financial technologies could make incumbent banks more efficient and profitable, reinforcing existing economies of scale and scope in banking. This would mean a *restoration*, reinforcing incumbents' power.

The balance of these forces may yield a third alternative – a *reformation* – a more diverse, resilient and effective system for consumers. One where large banks exist alongside new entrants who compete across the value chain.

Tonight, I want to discuss how FinTech could affect the Bank of England's policy objectives and our role in enabling FinTech to meet its promise for the people we serve. I will begin with the former.

3. The Potential impact of FinTech on financial and monetary stability

FinTech has the potential to affect monetary policy transmission, the safety and soundness of the firms we supervise, the resilience of the financial system, and the nature of shocks that it might face.

It could also have profound implications for the Bank's secondary objective, as supervisors, to facilitate effective competition between the firms we regulate.

The impact on firms' safety and soundness depends on several factors. By making wholesale and retail settlement faster and capital allocation more efficient, FinTech could boost banks' returns and therefore viability.

Already, FinTech is spurring new entrants including payments providers, peer-to-peer lenders, robo advisors, innovative trading platforms, and foreign exchange agents. This could, with time, unbundle traditional banking models and deny banks their traditional economies of scale and scope.

The systemic consequences of FinTech are even more complex. More diverse business models and alternative providers are positives for financial stability. By allowing better credit screening and less adverse selection, FinTech could improve risk assessment, credit allocation, and capital efficiency. But if it encourages herding on common information, trading positions could become more correlated. And if switching costs in funding markets fall, liquidity risk could rise and systemic risks grow.

Indeed, sometimes when I hear of democratising finance, spreading risk in capital-light originate-to-distribute models, I think I haven't been this excited since the advent of sub-prime.

FinTech could also affect the conduct of monetary policy. Unbundled banking would change the roles of bank capital and funding costs in the credit channel of monetary policy. If FinTech enhances participation in financial markets, the wealth channel of monetary policy could strengthen.

More broadly, Big Data techniques could tell us about the state of the economy more accurately and promptly. Forecast performance could improve, akin to the forecast improvements that better measurement of atmospheric conditions has, over time, delivered for meteorologists.

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may help to lower the compliance costs which major banks say have been a factor in their decisions to withdraw from correspondent banking. And in time, FinTech may broaden the pool of non-banks able to provide individuals and companies with viable alternatives, but for now banks continue to act as gatekeepers to payment and settlement in central bank money.

My own forecast is that FinTech's consequences for the Bank's objectives will not become fully apparent for some time. Many of the technologies needed to deliver such transformations are nascent – their scalability and compatibility untested beyond Proofs of Concept. Moreover, the bar for displacing incumbent technologies is very high. Nor will the Bank of England take risks with the resilience of the core of the system. Disruption won't come either easy or cheap.

4. Enabling the FinTech Transformation

We are actively exploring how new financial technologies could support our policy objectives. There are five ways the Bank is enabling the FinTech transformation.

The first is widening access to central bank money to non-bank Payments Service Providers, known as PSPs. [3]

As the internet revolutionised commerce, making trade faster and markets more competitive, payments technology lagged in many countries, although it is worth remembering that the UK has been a global leader on real-time retail payments. Faster Payments (FPS) was one of the earliest real-time retail systems introduced, in 2008. Now, new entrants and established players are seeking to provide payment services that are instantaneous, secure, reliable and accessible anytime from anywhere.[4]

Retail consumers and firms are increasingly demanding payments completed in seconds, not hours or days.

They expect payments to be seamless, reliable and cheap whether to recipients overseas or just up the street.

And they expect to make payments without visits to a bank branch or even logging onto a desktop computer.

Similarly, companies, financial intermediaries and governments want to process ever larger and more complex bulk payments covering multiple systems, countries and currencies.

Central banks lie at the hearts of payment systems, giving households and firms the assurance that transactions have settled in the most secure form of payment: central bank money. To fulfil that role, our payments infrastructure needs to remain fit for purpose: reliable, resilient and robust. But we must also be responsive to changing payments demands. So earlier this year the Bank announced we would be drawing up a blueprint to replace our current real-time gross settlement (RTGS) system, now twenty years old.

48 institutions currently have settlement accounts in RTGS. All other users of the systems that settle across RTGS access settlement via one of four agent banks.[5] These users include over 1000 non-bank PSPs serving customers' increasingly demanding standards, and many rely on major UK payment schemes, particularly Faster Payments (FPS).

As they grow, some PSPs want to reduce their reliance on the systems, service levels, risk appetite and goodwill of the very banks with whom they are competing. Re-selling services ultimately provided by banks limits these firms' growth, potential to innovate, and competitive impact.

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[3] These PSPs include firms granted the status of either an e-money or payment institution in the UK.

[4] Examples include From Stripe to Square, from Paypal to Ripple, from Applepay to Zapp.

[5] Indirect access removes the need to build costly payments infrastructure – a potentially large fixed cost for young companies.

That is why I am announcing this evening that the Bank intends to extend direct access to RTGS beyond the current set of firms, allowing a range of non-bank PSPs to compete on a level playing field with banks. [6]

By increasing the proportion of settlement in central bank money, diversifying the number of settlement firms, and driving greater innovation in risk-reducing payments technologies, expanding access should bring financial stability benefits. It should also enable more efficient, effective and inclusive payments, including in ways that we cannot fully anticipate.

It is not a one-way street, however.

As we extend access, we will safeguard resilience in three ways: by holding settlement account holders to the appropriate standards; by removing legislative barriers to non-bank access; and by designing the right account arrangements for new entrants.

I am pleased that both the FCA and HMRC, who together supervise these institutions, are committed to developing a strengthened supervisory regime for those who apply for an RTGS settlement account, to give assurance that non-bank PSPs can safely take their place at the heart of the payment system.

And I welcome the Chancellor's commitment tonight to make the necessary legislative changes to ensure that these new entrants can access RTGS safely and efficiently.[7]

By extending RTGS access, our objective is to increase competition and innovation in the market for payment services. To ensure that PSPs are not disadvantaged relative to banks offering equivalent payment services, the Bank intends to give appropriate remuneration for balances that PSPs will be required to hold overnight to support their payments activities.[8]

The second way the Bank is enabling the FinTech transformation is by being open to providing access to central bank money for new forms of wholesale securities settlement.

Securities settlement is the lifeblood of modern wholesale financial markets – the associated payments account for fully half of RTGS's daily settlement flows.

However, as with retail payments, securities settlement is now ripe for innovation. A typical settlement chain can involve many different intermediaries, meaning securities settlement is comparatively slow. Transactions that take nanoseconds to execute settle in days. This also means large costs and operational risk. And, like in payment systems, economies of scale introduce concentration and create single points of failure. All of that ties up potentially tens of

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6 Another key enabler of PSP access to major retail payment systems such as FPS is the development of aggregators that can provide direct technical connections to the infrastructure, reducing the costs of building this capability for newer entrants. The intention is that these aggregators could be used by PSPs without an RTGS account, but under this arrangement PSPs would still need an agent bank for settlement of their obligations across RTGS.

7 The legislative changes include adding Payment Institutions to the list of regulated entities to whom the Settlement Finality Regulations apply, modifying the Payment Services and Electronic Money Regulations to enable safeguarded funds held by E-Money Institutions and Payment Institutions to be posted with the Bank and amending the Banking Act to expand HM Treasury's powers to grant the

Bank of England with the ability to supervise any relevant payments systems if they ultimately grow large enough to pose a systemic threat. The first is essential to enable these firms to benefit from the critical protections the Settlement Finality Regulations offer to users of major UK payment systems. The second is needed to enable these firms to deposit monies in RTGS on behalf of their customers. The final change provides assurance that any longer-term stability implications of these changes can be addressed under the Bank's prudential remit.

8 We do not intend, however, to extend facilities to PSPs for which they have no need. Non-bank PSPs will not therefore be eligible for membership of the Sterling Monetary Framework – and in particular the Bank's credit facilities. That is because PSPs are not part of the monetary policy transmission mechanism or exposed to inherent overnight liquidity risk. The Bank may also take steps to limit PSPs' capacity to hold unlimited overnight balances on their settlement accounts.

billions of pounds worth of capital. With the economics of wholesale banking under pressure, cutting inefficiencies is a high priority for industry.

That is why it is welcome that FinTech innovators are exploring the potential of distributed ledger technology to simplify the settlement chain, reduce its cost, and raise its speed while increasing resilience. The instruments involved range from equities to bank loans. However, the challenges facing such projects are legion, including reliability, resilience, security and scale. And fundamentally, how to prove technologies that are still nascent?

One challenge an otherwise robust system of sufficient scale would not face is access to central bank money from the Bank of England. The Bank has for many years sought to ensure that, wherever possible, wholesale securities settlement occurs in central bank money.

We are already clear that we stand ready to act as settlement agent both for regulated systemically important schemes supervised by the Bank, and, on a case-by-case basis, for other new systems.[9] The Bank will use this to enable innovation and competition, without compromising stability.

The third way the Bank is enabling the FinTech transformation is by exploring the use of Distributed Ledger (DL) technology in our core activities, including the operation of RTGS.

If distributed ledger technology could provide a more efficient way for private sector firms to deliver payments and settle securities, why not apply it to the core of the payments system itself?

The great promise of distributed ledgers for central banks is their potential to enhance resilience. Distributing the ledger means multiple copies of the system. It can continue to operate if parts get knocked out. That removes the single point of failure risk inherent in a centralised system.

But if we are to entrust the heart of our financial system to such technology, it must be robust and reliable. The payments system we oversee processes £½ trillion of bank transactions, equivalent to around 1/3 of annual GDP, *each day*. Disruptions are potentially costly. That is why, in payments and settlement, the Bank has an extremely low tolerance for any threat to the integrity of the economy's 'plumbing'. We won't beta test RTGS.

To help distinguish DL's potential from its hype, the Bank has set up our own as a Proof of Concept. We have learned a great deal – about the opportunities and the challenges that need to be met before DL could be used in central banking.

Some of those challenges are familiar to any payments system.[10] Others are more specific to DL. For example, we would need assurance that DL systems can be scaled, retain data integrity, and operate at the speeds and volumes required by central bank infrastructure – day in, day out.

And we need to be certain that the privacy of the data in those distributed copies cannot be compromised by cyber attack, not just today but in the future. One way this might be achieved is to limit the distribution of the ledger to existing trusted parties, such as other public sector entities.

To move forward we are working with other central banks. Beyond this we are open to working with others to explore further possibilities, including alternative applications of the technology.

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[9] The criteria are publicly available in the Bank's Settlement Account Policy, available at: http://www.bankofengland.co.uk/markets/Documents/paymentsystems/boesettlementaccounts.pdf.

[10] In particular, participants need to be identifiable; permissions need to be assigned; messaging must be secure; and transactions must be verified, recorded, and stored. Ownership of assets must be capable of being determined with certainty, particularly in the event of a participant default.

In the extreme, a DL for everyone could open the possibility of creating a central bank digital currency. On some levels this is appealing. For example it would mean people have direct access to the ultimate risk-free asset. In its extreme form, it could fundamentally and perhaps abruptly re-shape banking.

However, were it to co-exist with the current banking model, it could exacerbate liquidity risk by lowering the frictions involved in running to central bank money.[11] These questions and others are why these topics are being examined as part of the Bank's research agenda, with the prospect of a central bank digital currency for the UK, in my view, still some way off. We will work to make payments easier, and though cash may no longer be king it once was, its reign will endure for some time.

The fourth way the Bank is enabling the FinTech transformation is by partnering with FinTech companies on projects of direct relevance to the Bank's mission.

I am announcing tonight that the Bank is launching a FinTech Accelerator to work in partnership with FinTech firms on challenges that we, as a central bank, uniquely face. The Accelerator will work with new technology firms to help us harness FinTech innovations for central banking. In return, it will offer firms the chance to demonstrate their solutions for real issues facing us as policymakers, together with the valuable 'first client' reference that comes with it. With time, the Accelerator will build a network of firms working in this space for the benefit of us and them alike.

How will this help us?

Consider that the Bank monitors risks that threaten the operational resilience of the UK financial system.

At the Financial Policy Committee's instigation, we have been working with other authorities to encourage firms to improve their cyber defences.

Over the past two years, twenty-three firms have undergone CBEST penetration tests, with all core banks expected to have completed tests by the end of this year.

To complement these efforts, the Bank has begun examining how public data could be used to assess firms' cyber resilience, including looking for malware on a firm's systems, software vulnerabilities, or weak encryption that could be exploited by hackers.[12]

As a proof of concept and good cyber hygiene, we are using data publically available on the web to assess our own resilience. Early results indicate these techniques could complement existing tests in our regular assessments of firms' operational resilience.

We are also exploring how we - and others - could use the data the Bank collects more effectively. Big Data has the potential to help the Bank's policy committees identify trends in systemic risk and the economy. Much of the data we collect is rightly subject to strict limits on confidentiality and sharing. For example, our regulatory mortgage contract data comes under strict control to guarantee personal data protection. We can't just share the private data to which we have access with external researchers, foreign authorities or even across the Bank.

But this means that, simply put, the people of the United Kingdom are not getting the most out of the data the Bank collects.

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[11] For further discussion see Broadbent (2016), "Central banks and digital currencies", available at: http://www.bankofengland.co.uk/publications/Pages/speeches/2016/886.aspx.

[12] This allows an efficient check of a firm's cyber defences akin to the way a policeman could walk by a house and observe, from the outside, its security features – whether the gate is locked; whether it has an alarm; whether windows have been left open; what routes intruders might use to gain access to the property; and so on.

That's why we are investigating ways of anonymising and de-sensitising data – fully respecting privacy laws without losing analytical content – to allow wider sharing.

Progress has been encouraging creating the prospect of better informed policy making.[13]

These are just two examples of a bigger programme of collaboration between the Bank and technology innovators. We are open to further collaboration and tomorrow will provide details of the next steps.

Finally, the Bank is calibrating its regulatory approach to FinTech developments.

FinTech should neither be the Wild West nor strangled at birth. The Bank is devoting considerable resources to ensure whatever develops is sustainable, not ephemeral.

If FinTech enables a great unbundling of financial services, risks will change in tandem.

Our interest is in ensuring the safety and soundness of banks, the protection of insurance policy holders and the resilience of financial ecosystem as a whole to these changing risks. It is about activities not labels.

That is why the Bank has been engaging with FinTech firms to understand better the financial stability risks that could emerge as banking is re-shaped. We will monitor those that arise along the transition path and those that could endure.

Where firms or activities become systemic and risks to the real economy grow, they will come within the purview of the Bank's responsibilities for the stability of the system as a whole. The Financial Policy Committee will continue to monitor the scope of the regulatory perimeter. Adjustments will follow if necessary.

When FinTech companies fall within our remits, we will monitor them in the same proportionate way that we approach other firms – backed by analytics and judgement, taking action where appropriate.

We are building a system that allows for orderly failures. Not just to end the blatant unfairness of Too Big to Fail, but also to foster industry dynamism and better outcomes for consumers. After all, ease of exit promotes ease of entry. We won't discourage avatars by preserving dinosaurs.

5. Conclusion

Will FinTech mean a restoration, reformation, or revolution for finance?

Through our regulatory approach, widening access to RTGS, and facilitating technological development, the Bank is helping to enable a sustainable FinTech reformation.

This will promote the UK's monetary and financial stability and mean better financial services for firms and households. With time, FinTech could mean a more open, more transparent, and more democratic global financial system. As host to the world's greatest financial centre, this room, this City, this country stand to gain tremendously. The Bank will play its role in enabling a blissful dawn to unfold; to set *the budding rose above the rose full blown*.

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[13] More broadly, Sir Charlie Bean's independent review of economic statistics highlighted the impact on economic data arising from inadequate sharing of data across the public sector, something that I am pleased that the Cabinet Office is taking steps to address.