

The Bank of England's supervision of financial market infrastructures — Annual Report

(For the period 21 February 2018 — 14 February 2019)



BANK OF ENGLAND





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Presented to Parliament pursuant to section 203B of the Banking Act 2009, paragraph 33 of Schedule 17A to the Financial Services and Markets Act 2000 (FSMA) and Regulation 25 of the Central Counterparties (Amendment, etc, and Transitional Provision) (EU Exit) Regulations 2018.

14 February 2019

(1) Please note, references to '2018' in this *Report* should be taken as referring to this reporting period.

Foreword



Jon Cunliffe
Deputy Governor, Financial Stability

The financial market infrastructure firms (FMIs) supervised by the Bank of England (the Bank) perform a vital economic function. They enable payments for goods and services, record ownership of bonds and shares, and help financial market participants — in the United Kingdom and abroad — to manage risk. They also support the smooth operation of the wholesale money markets that are used by the Bank to implement monetary policy. The safe and reliable operation of supervised FMIs is central to the Bank's overarching mission to maintain monetary and financial stability in the UK.

Over the past year the Bank's supervision of FMIs has, as in previous years, provided the foundation to our confidence in financial stability. Alongside this essential work, in 2018, we have worked to ensure that the FMIs and the Bank as their supervisor are suitably prepared for the UK's withdrawal from the EU, including in the event that the UK leaves the EU without a deal on 29 March. We have taken the necessary steps to avoid interruption to the vital services that the FMIs provide.

As part of this work, we have closely monitored UK FMIs' EU withdrawal contingency plans and where appropriate worked with the relevant domestic and EU authorities to reduce the risk of disruption. Steps taken by the European Commission in December 2018 (described in Box 3 of this *Report*) in respect of UK central counterparties (CCPs) and central securities depositories (CSDs) were particularly important in addressing potential risks to financial stability which had been flagged by the Financial Policy Committee (FPC).

In addition to contingency planning, the Bank has provided advice to the UK Government on its work nationalising EU law to enable FMIs to continue to operate within a legal framework that is based on the EU framework in place today. As part of this, we have made preparations to assume responsibility for recognising overseas FMIs that wish to offer services in the UK after EU withdrawal. This includes ensuring that these FMIs are suitably informed about the steps they need to take to enter the transitional arrangements applicable to them in a no-deal scenario.

Preparing for EU withdrawal has been a significant undertaking but we have also made progress on a number of other important areas. A particularly important step to enhance our supervisory framework has been to develop a fuller articulation of the objectives of FMI supervision, as set out in Box 1 of this *Report*. The revised objectives provide a transparent anchor for supervisory decision-making and emphasise that the Bank is committed to taking an international as well as domestic perspective to FMI supervision. This includes working closely with other regulators globally to ensure that UK FMIs operate in a manner that supports monetary and financial stability in other countries as well as the UK.

This *Report* also highlights other important developments including the expansion of the Bank's supervisory remit to include specified service providers to payment systems recognised as systemically important by HM Treasury (HMT) (with Vocalink being the first such entity as set out in Section 2.5.1). It also outlines important work on the operational resilience of FMIs, including cross-authority policy work being run in co-operation with the Prudential

Regulation Authority (PRA) and the Financial Conduct Authority (FCA). Details can be found in Chapter 3 of the *Report*.

This is the sixth year that the Bank has published a *Report* into FMI supervision. I hope this *Report* demonstrates that the Bank has continued to supervise UK FMIs thoroughly while also making all necessary preparations for EU withdrawal and making structural improvements to our supervisory framework. The smooth operation of UK FMIs delivers tangible economic benefits in the UK and abroad. Effective and rigorous supervision is vital to realising these benefits.

A handwritten signature in black ink, appearing to be 'J. G. S.', written in a cursive style.

February 2019

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Chapter 1: Financial market infrastructures — why does their resilience matter?

Financial market infrastructures (FMIs) are entities which sit at the very heart of our financial system. Sometimes referred to as the plumbing of the financial system, they are hubs through which networks of businesses and individuals transact with each other every day. FMIs have evolved to help reduce the risks and costs involved in making payments and settling transactions in financial instruments. Members of the public as well as businesses and financial institutions use FMIs to process millions of transactions. From individuals buying a cup of coffee with a card payment through to entities settling high-value financial contracts, FMIs have become an integral part of our financial system and they perform a critical role within the economy.

FMIs perform a unique role in the financial system in that they connect a variety of users together via their transactions with each other. Typically the users of FMIs have no viable alternative to settle payments and securities transactions. As such, it is essential that they operate reliably and in the public interest.

The FMIs that the Bank regulates fall into three broad categories: payment systems, central securities depositories (CSDs) and central counterparties (CCPs).

Payment systems allow funds to be transferred between businesses and individuals and they are used for many day-to-day transactions that many of us will be familiar with, such as withdrawing cash from a cash machine, receiving salary payments or making online payments.

CSDs are systems that keep records of ownership of individual securities, such as a share in a publicly listed company. They also facilitate the transfer of ownership of these securities between people or entities in a secure way.

CCPs sit between the buyers and sellers of financial contracts, providing assurance that the obligations of those contracts will be fulfilled. When a buyer and seller agree that a financial contract will be centrally cleared, the CCP sits between them. Instead of holding the contract with each other, the buyer and seller each hold their side of the contract with the CCP instead. Collateral is placed with the CCP in case either party fails to meet their side of the contract so that the CCP can use that collateral to make good on the contract.

The Bank supervises all UK CCPs, UK CSDs and systemically important recognised payment systems and specified service providers to those payment systems.⁽²⁾ **Table A** lists the FMIs and specified service providers which the Bank has legal powers to supervise.

1.1 Interconnectedness between FMIs and the wider financial system

By their nature, FMIs are highly interconnected with the wider financial system as a result of the unique role that they perform. By acting as a central hub, FMIs simplify the pattern of interconnectedness between companies and individuals in financial transactions. They also make transactions that take place within their networks more efficient and secure than if they were to take place bilaterally.

FMIs contribute to financial stability by providing reliable and secure payment, clearing and settlement services to their users. It is vital that these services are resilient to financial and operational shocks. FMIs can also contribute

(2) Throughout the *Report* CCPs, CSDs, recognised payment systems and specified service providers are referred to as FMIs unless specified otherwise.

to financial stability by encouraging or requiring their members to take steps that reduce risks that are inherent in making transactions and by ensuring that they avoid behaviours that could create stress elsewhere in the financial system. **Figure 1** provides a simplified illustration of the interconnectedness between different FMIs as well as with other market participants such as members of the public, banks and other financial institutions.

Because of the important role that they play and the reliance placed on them by their users, disruptions at an FMI have the potential to be a source of stress within the financial system. Stresses within the system could be amplified and spread in a number of different ways, impacting the ability of individuals and businesses to transact in the real economy. For example, an IT disruption at a payment system could prevent people from receiving their salary payment into their bank account. This would have a knock-on impact to any outgoing payments (such as rent or utilities payments) that could not be made. Similarly, disruptions within all supervised FMIs can have significant knock on consequences for the networks that use them.

It is therefore important that FMIs are resilient to disruption so that they can continue to provide their critical services to the economy and support wider financial stability.

Table A The FMIs and specified service providers supervised by the Bank and a non-exhaustive selection of their functions

Central counterparties (CCPs)	Central securities depositories (CSD)	Payment systems	Specified service providers
ICE Clear Europe (Listed derivatives and over-the-counter (OTC) credit default swaps)	Euroclear UK & Ireland (EUI) (Securities transactions)	Bacs (Paying bills) (Receiving benefits/pensions/salaries)	Vocalink (Technology service provider for payment systems and ATM switching platforms)
LCH (Repos, listed, and OTC derivatives and securities)		CHAPS ^(a) (High-value sterling payments) (Cross-border sterling payments) (House purchases)	
LME Clear (Listed and OTC metals contracts)		CLS (High-value FX transactions)	
		Faster Payments Service (FPS) (Internet, mobile, and telephone banking payments)	
		LINK (Withdrawing cash)	
		Visa Europe (Paying for goods/services)	

(a) The Bank's FMI supervisory area continues to supervise the CHAPS system to the same standard as recognised payment systems even though it was derecognised in December 2017.

1.2 What is FMI resilience?

A resilient FMI is one that can absorb shocks rather than contribute to them. It has robust processes, systems and financial resources to allow it to withstand extreme market and operational events. A resilient FMI is able to respond to and learn from interruptions to its services that have the potential to cause disruption to the vital payment, clearing and settlement services they provide and cause instability in the wider financial system.

Because of their interconnected nature, FMIs can be exposed to risks of disruption which originate within themselves as well as emanating from the members that use them. It is important for FMIs to manage the risks they face directly as well as being alert to risks which may arise within their users.

FMIs can be subject to disruption from both financial and operational risks. Financial resilience is important for FMIs to ensure they can survive financial shocks, notably arising from the failure of one or more participants to fulfil its obligations to the FMI and other participants. To be financially resilient, FMIs need to ensure that they have sufficient financial resources to enable them to withstand these types of shocks.

Operational resilience refers to the ability of firms, FMIs and the sector as a whole to prevent, respond to, recover and learn from operational disruptions. FMIs manage operational risks with the help of tools such as business

continuity and contingency planning, and by carefully considering the amount of disruption that can be tolerated in the event of an incident.

1.3 The role of the Bank of England

One of the Bank's objectives is to protect and enhance the stability of the financial system of the United Kingdom, and the supervision of FMIs is central to that objective. The Bank has legal powers to supervise FMIs and specified service providers listed in **Table A**, including with respect to their safety and resilience to risks, both operational and financial, which could result in financial instability.

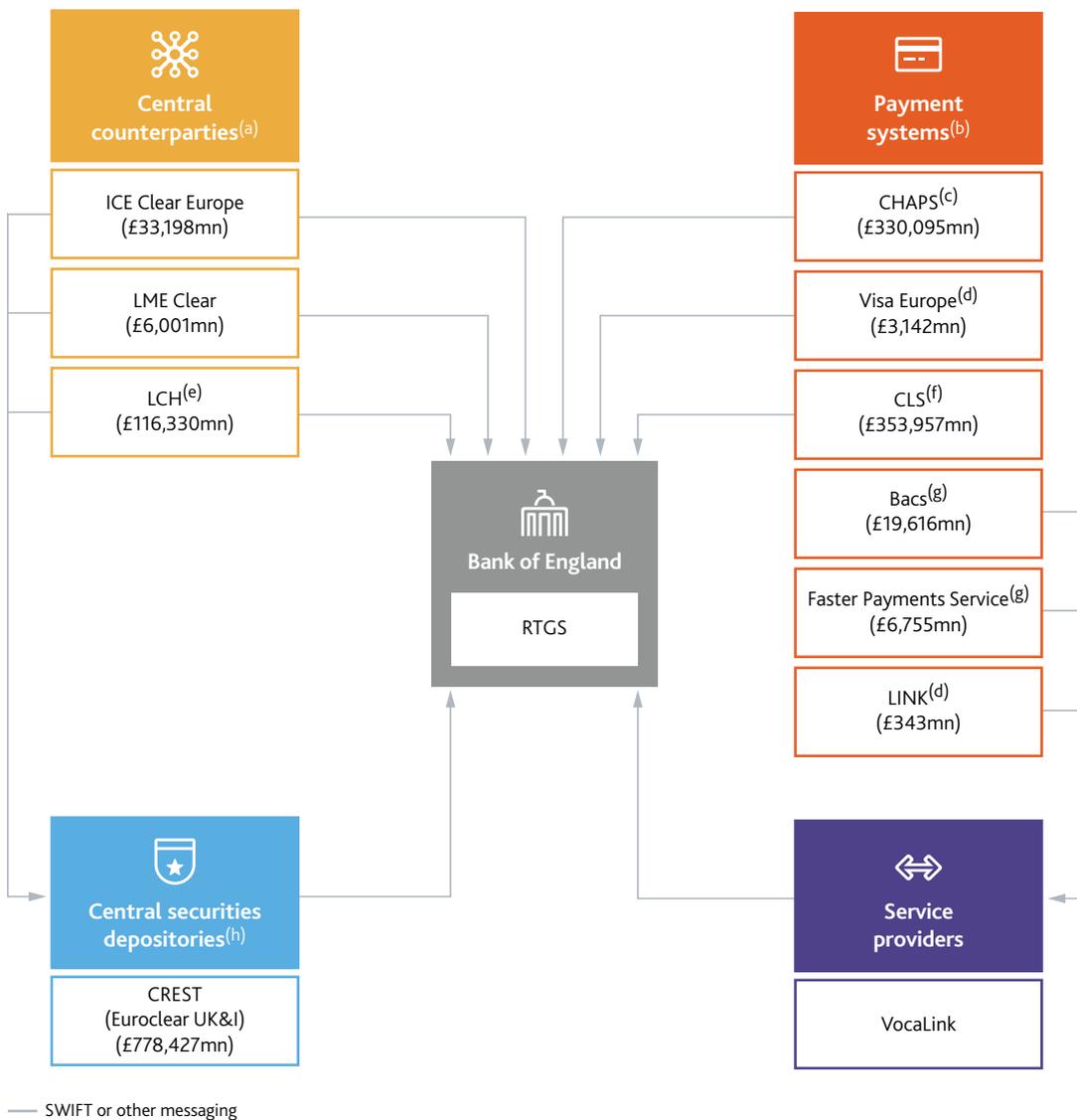
The Bank's supervision of FMIs takes place in the context of a wider programme of FMI-related policy and research work which contributes to the further development of the regulatory framework for FMIs and supervisory best practice.

Figure 1 Financial market infrastructures supervised by the Bank of England

Financial market infrastructures support a number of vital functions right across the economy...



...and their interconnected nature means that maintaining their financial and operational resilience is a key part of the Bank's mission.



(a) Total initial margin requirements (sterling equivalent). The end of day total margin requirement per default waterfall, averaged over all business days in the period. See Annex 2 for more details.
 (b) Daily average value.
 (c) The functions of CHAPS have moved to the Bank of England.
 (d) LINK and Visa Europe also settle payments through settlement banks.
 (e) FX options settle via CLS.
 (f) Sterling only.
 (g) The functions of Bacs and the Faster Payments Service have moved to Pay.UK.
 (h) Daily average value for sterling.

Chapter 2: How the Bank supervises FMIs, including work with other UK and international authorities

The Bank has a range of powers set out in law to regulate FMIs. The Bank's supervisory approach is based on internationally agreed standards and it continues to work collaboratively both domestically and internationally to ensure that FMIs are effectively supervised. In 2018, the Bank assumed more responsibility as a result of changes to legislation that brought service providers to some FMIs within its regulatory remit. The Bank is also committed to continually improving its approach to supervision. This chapter highlights key developments relating to the Bank's objectives and FMI landscape over 2018.

2.1 How is the Bank's supervisory approach constructed?

The Bank's supervision of FMIs is shaped by different pieces of legislation, regulation and standards at UK, EU and international level. The Bank's supervisory approach is based on the Principles for Financial Market Infrastructures (PFMI) developed by the Committee on Payments and Market Infrastructures (CPMI) and International Organization of Securities Commissions (IOSCO). The PFMI are international standards that FMIs should follow in areas such as governance arrangements, financial resources, and the management of certain types of risk.⁽³⁾

The Bank's supervision of FMIs is judgement based and forward looking. It is carried out using a supervisory risk assessment framework designed to identify risks that FMIs may be exposed to and assess the mitigants that FMIs have in place to guard against those risks. There are three broad categories of risk mitigant within the framework:

- operational mitigants which are processes that FMIs have in place to ensure their operational resilience. Examples include governance arrangements within FMIs and their risk management and controls;
- financial mitigants which are sufficient collateral (eg margin and default funds for CCPs), capital, and liquid resources to protect their financial resilience; and
- plans to ensure recovery and resolvability if the risks to which an FMI was exposed crystallised to such an extent that its continued operation is threatened.

The Bank conducts periodic assessments of each FMI it supervises, from which it sets risk-mitigating actions it expects to be taken (known as Priorities). These assessments are informed by a continuous cycle of supervisory engagement which is intended to identify risks as they emerge. The Bank also carries out a programme of core assurance reviews which correspond to the risk mitigants set out above. These reviews assess whether FMIs are suitably addressing any risks across the broad range of their operations, consistent with the relevant Principles set out in the PFMI.

The Bank has legal powers to commission reviews into supervisory topics by third-party external experts.⁽⁴⁾ These play an important supplementary role to the Bank's supervisory activities and can focus in detail on specific issues. The commissioning of a third-party review is not necessarily viewed as a sign that an FMI has failed to meet its

(3) www.bis.org/cpmi/publ/d101a.pdf.

(4) Paragraph 12 of Schedule 17A to the Financial Services and Markets Act 2000 and section 195 of the Banking Act 2009.

Box 1

The Bank's updated supervisory objectives

The Bank is committed to discharging its responsibilities — including supervision of FMIs — in an open and accountable manner. The Independent Evaluation Office (IEO), an independent evaluation function embedded within the Bank, was established as part of the Bank's 2014 Strategic Plan. The governance and oversight structure of the IEO safeguards its independence.

The IEO reviewed the Bank's approach to FMI supervision in 2016 and published its findings in February 2017.⁽¹⁾ The IEO concluded that the Bank was an 'acknowledged world leader in the field of FMIs and [that] the framework put in place for supervision has dealt effectively with the risks of the past few years'.⁽²⁾ It found no material shortcomings in the Bank's supervisory approach, but nonetheless made a number of recommendations for further improvement. The recommendations — and how the Bank has responded to them — are summarised in Box 1 of last year's *Annual Report*.⁽³⁾

The Bank's response to the IEO recommendations has included clarifying the objectives of FMI supervision. This work is particularly significant in view of the generality with which the Bank's objective for FMI supervision, rooted in its financial stability objective, is set forth in legislation. In contrast, other areas of supervision within the Bank's mandate, such as banking and insurance supervision, have more detailed statutory objectives.⁽⁴⁾ Clear supervisory objectives are valuable in helping supervisors determine which risks matter most; ensuring supervised firms understand what is expected of them and why; and providing a transparent benchmark against which the public, Parliament and other stakeholders can evaluate the effectiveness of supervision.

To realise these benefits, the Bank has developed a fuller articulation of the objectives of FMI supervision as shown below. The new statement of objectives is anchored upon the Bank's overarching mission to promote monetary and financial stability, and identifies three channels through which FMIs contribute to this objective. Taken together, the three channels make clear that the Bank expects each FMI it regulates to do more than provide a robust and reliable service, but also take appropriate steps to reduce — where possible — risks to the wider financial system connected with arrangements for making payments, settling securities transactions and clearing trades. The Bank would not, however, expect an FMI to take actions that compromise its own resilience. This is consistent with international standards for FMIs, notably the expectation in the PFMI that an FMI should have objectives that explicitly support financial stability and other relevant public interest considerations as well as place high priority on the safety of the FMI.⁽⁵⁾

The statement also refers explicitly to the Bank taking an international perspective to FMI supervision. This is because several UK FMIs provide services which are significant in multiple jurisdictions. The Bank discharges this responsibility, for example, by co-operating closely with overseas authorities through supervisory colleges and similar arrangements.

The Bank has also established enhanced arrangements for informing and engaging the Financial Policy Committee (FPC) — a statutory committee within the Bank that is responsible for identifying, monitoring and taking action to remove or reduce systemic risks, with a view to protecting and enhancing the resilience of the UK financial system — on potential systemic risks in the FMI sector.

(1) www.bankofengland.co.uk/independent-evaluation-office/fmi-supervision-february-2017.

(2) See paragraph 4 of the executive summary of the IEO report; www.bankofengland.co.uk/independent-evaluation-office/fmi-supervision-february-2017.

(3) See Box 1, page 11 of the FMI Annual Report 2018; www.bankofengland.co.uk/news/2018/february/supervision-of-financial-market-infrastructures-annual-report-2018.

(4) See page 4 of the PRA approach to banking supervision; www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/approach/banking-approach-2018.pdf. See page 4 of the PRA approach to insurance supervision; <https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/approach/insurance-approach-2018.pdf>.

(5) PFMI 2, KC1; www.bis.org/cpmi/publ/d101a.pdf.

The Bank of England's supervisory objectives with respect to the supervision of FMIs

The Bank of England's regulation of financial market infrastructure (FMI) contributes towards its mission to promote the good of the people of the United Kingdom by maintaining monetary and financial stability. In particular, the Bank seeks to ensure that the FMIs it regulates reduce systemic risk by:

- (a) Avoiding disruption to the vital payment, settlement and clearing services they provide to the financial system and real economy;*
- (b) Avoiding behaviours that have an adverse impact on the safety and soundness of their members, subject to preserving the resilience of the FMI; and*
- (c) Contributing to identifying and mitigating risks in the end-to-end process of making payments, clearing and settling securities transactions, and clearing derivatives trades.*

Where necessary to achieve (a), the Bank additionally regulates certain other firms with regard to the critical services they provide to the FMIs it regulates.

The Bank's regulation of FMIs takes an international as well as a domestic perspective, recognising that some of the FMIs it regulates are important for financial and monetary stability in more than one jurisdiction, and that disruption to international payment, settlement or clearing arrangements is likely to create increased risks to monetary and financial stability in the UK.

regulatory requirements. They are another tool which the Bank can use to help assess risks and maintain financial stability.

The Bank's senior FMI decision-making body is the FMI Board which is a committee constituted through powers delegated to the Governor by the Court of the Bank. FMI Board is chaired by the Deputy Governor for Financial Stability. FMI Board also comprises three independent members to broaden the range of opinions and challenge.

2.2 Assurance work on the Bank's supervision of FMIs

Following the commitments made by the Bank in response to the February 2017 IEO report, the Bank's supervision of FMIs is now subject to oversight by the PRA's Supervisory Oversight Function, which provides independent firm-level assurance on the quality and effectiveness of supervision.

2.3 Domestic co-operation

Domestically, the Bank co-operates closely with both the FCA and the Payment Systems Regulator (PSR), in line with their respective mandates, in relation to supervising market infrastructure and payment systems respectively. Co-operation supports effective supervision and policymaking by sharing information between the regulators and promotes efficiency by minimising duplication. The frameworks for co-operation are set out in Memoranda of Understanding (MoUs) which are reviewed annually by the parties involved, including by seeking feedback from supervised FMIs.

2.3.1 MoU between the Bank and FCA

The Bank and FCA held a consultation with FMIs and reviewed their co-operation regarding market infrastructure in late 2018. The authorities concluded that the MoU's arrangements for co-operation remain effective, with appropriate co-ordination and no material duplication. Industry respondents acknowledged the efforts made on co-operation and the Bank and FCA remain committed to effective co-operation. The authorities will update the MoU to ensure it continues to appropriately reflect their respective roles and responsibilities once the UK has left the EU.

2.3.2 MoU between the Bank, FCA and PSR

The outcome of the review of the Bank, FCA and PSR MoU in 2018 was that co-operation and co-ordination under the MoU is working well. Building on the initiatives identified in the 2017 review and implemented over the last year, the authorities have identified a number of areas to further deepen co-operation and co-ordination; these will be implemented over the coming year. In conducting this review, the authorities emphasised their on-going commitment to working closely together on issues of common regulatory interest and avoiding duplication. The authorities are also making minor changes to the MoU this year to reflect recent legislative changes or other structural changes. The authorities will also review the MoU over the next year to ensure it continues to appropriately reflect their respective roles and responsibilities once the UK has left the EU.

2.4 International co-operation

Due to the international nature of FMIs, it is important that both domestic and international authorities co-operate with respect to supervision. The Bank, in line with expectations set out in the PFMI, draws on a broad range of expertise and perspectives of relevant authorities, thereby increasing the effectiveness of its supervision and the transparency of the risks to which FMIs supervised by the Bank are exposed.

Co-operative supervision is put into place through MoUs that the Bank has with a wide range of international jurisdictions. The Bank was the first supervisor to establish global supervisory colleges for CCPs and Crisis Management Groups (CMGs) — which are committees developed to co-ordinate the resolution of CCPs. The Bank is also, to our knowledge, unique in inviting other college members to participate in supervisory reviews of CCPs. During 2018, the Bank chaired five supervisory colleges, with representation from 34 authorities from across the globe.

The Bank also participates in colleges of non-UK FMIs that are systemically important to the UK financial system, but are supervised by other regulators. This includes involvement in co-operative supervision and oversight arrangements.

The Bank's FMI supervisory and policy teams also contribute to many international FMI-related committees and working groups, for example those hosted by the G20 and the Financial Stability Board (FSB), the Bank for International Settlements (BIS), the European Central Bank and the European Securities and Markets Authority (ESMA).

2.5 Changes to FMI landscape over 2018

This year has seen a number of statutory and non-statutory changes to the FMI regulatory landscape. This section highlights the main changes to the Bank's statutory powers, population of supervised FMIs, and supervisory approach. Where appropriate, the Bank has worked extensively with HMT on a number of these changes. The changes to the FMI landscape as a result of EU withdrawal are addressed separately in Box 3.

2.5.1 Changes to the population of supervised FMIs

In May 2018, Pay.UK (previously the New Payment System Operator (NPSO)) acquired two recognised payment systems — Bacs and Faster Payments Service (FPS). Before Pay.UK acquired the recognised systems, the Bank assessed Pay.UK's operational readiness.

In November 2017, HMT amended the Banking Act 2009 to enable it to bring specified service providers to recognised payment systems within the Bank's regulatory remit.⁽⁵⁾ On 24 April 2018, HMT specified VocaLink in the recognition orders of the Bacs, FPS and LINK systems.⁽⁶⁾ Additional powers with respect to specified service providers like VocaLink will allow the Bank to more effectively deliver its mandate of protecting and enhancing UK financial stability with regard to recognised payment systems.

(5) Explanatory memorandum; www.legislation.gov.uk/ukxi/2017/1167/pdfs/ukxiem_20171167_en.pdf.

(6) Recognition orders; www.gov.uk/government/publications/banking-act-specification-of-payment-systems.

The Bank published its approach to supervising specified service providers as an appendix to last year's *Annual Report*, and this will be applied to Vocalink. As set out in the approach, recognised payment system operators (RPSOs) will continue to have a primary role to play in monitoring, managing and mitigating risks that their service providers, including Vocalink, pose to their systems.⁽⁷⁾

2.5.2 Supervision of payment systems operated by the Bank — CHAPS

The largest and most systemically important payments in the UK are made over CHAPS, the UK's high-value payment system (HVPS). Until 2017 the delivery model for the CHAPS system involved a split in responsibilities across two institutions. The core infrastructure was provided by the Bank, as part of its Real-Time Gross Settlement (RTGS) system. CHAPS Co, a private sector company owned by its members, was responsible for operating the system's governance and rulebook and managing risks across the CHAPS system as a whole.

In November 2017, the functions performed by CHAPS Co were transferred into the Bank. The decision to make this change was made by the Bank following a public consultation, which concluded that financial stability would be enhanced if the HVPS adopted the 'direct delivery' model used in the overwhelming majority of jurisdictions globally. This conclusion was endorsed by the FPC and responded to recommendations made by the International Monetary Fund. Following transition to direct delivery, the Bank became the HVPS scheme operator alongside its pre-existing responsibilities for the RTGS infrastructure. As a result of this change, CHAPS was de-recognised as a recognised payment system operator under the Banking Act 2009. The Bank's FMI Directorate continues to independently supervise its operations on a non-statutory basis and to the same standard applied to recognised FMIs. The Bank's RTGS Renewal Programme (RT2) will lead to the replacement of the existing RTGS infrastructure which provides CHAPS settlement. The FMI Directorate includes oversight of the programme within its supervisory activities.

2.5.3 Legislative changes

2.5.3.1 Fee regime for FMIs

In June 2018 the Bank, in response to an IEO recommendation, published a policy statement introducing a new regime for levying fees for the supervision of recognised FMIs. In parallel, HMT laid a Statutory Instrument (SI) approving a scale of fees to which fees for recognised payment systems and specified service providers to recognised payment systems must relate.⁽⁸⁾ The IEO report stated that moving to a fee-based model could enhance the Bank's ability to adjust its staffing model and strengthen its ability to meet the resource requirements for large, one-off supervisory projects. In the June 2018 policy statement, the Bank concluded that levying fees on supervised FMIs is a more proportionate allocation of costs than its prior funding model and it aligns the Bank's FMI supervisory funding approach with that of the PRA. It provides greater transparency and accountability in the delivery of the Bank's FMI supervision functions.

The Bank implemented the FMI fee regime in June 2018. All FMIs which are supervised by the Bank under the Banking Act 2009 or the Financial Services and Markets Act 2000 (FSMA) are now charged fees in accordance with the fee regime (which also includes certain application fees) and charges were levied from August 2018. For the 2018/19 budget year, the total amount of annual fees charged is expected to be £4.8 million. The fees charged by the Bank cover its FMI supervisory activity and policy activity which supports this, as permitted by the Bank's fee levying powers, and is a pro-rata amount to account for the regime commencing part way through the Bank's financial year. FMI fee income will be included in the Bank's Annual Report and Accounts 2018/19 which will be published in 2019 H1.

2.5.3.2 Special administration regime

Secondary legislation setting out the rules that give effect in England and Wales to the UK's Special Administration Regime (SAR) for operators of certain infrastructure systems came into effect in August 2018. The SAR may apply to all recognised UK payment systems (other than recognised CCPs) and all recognised UK CSDs

(7) See Annex 1 of Bank of England Annual Report on supervision of FMIs (2017/18); www.bankofengland.co.uk/-/media/boe/files/annual-report/2018/supervision-of-financial-market-infrastructures-annual-report-2018.pdf.

(8) Final statement of policy; www.bankofengland.co.uk/paper/2018/policy-statement-on-fees-regime-for-fmi-supervision.

Table B FMI annual fee for 2018/19

	Central counterparties (CCPs)	Central security depository (CSD)	Payment systems and service providers
Category 1	£1.95 million	£1.05 million	£495,000
Category 2	£1.12 million		£330,000
Category 3			

Note: This encompasses the costs of FMI supervision together with relevant policy support, specialist resources and corporate services and other costs associated with the work of the FMI Directorate. The category rows have been left blank where there are no currently recognised firms. The 2018/19 fee year was not a full year and FMIs were invoiced a pro-rata amount.

operating securities settlement systems.⁽⁹⁾ The SAR modifies normal corporate administration procedures in order to ensure continuity of service and minimise disruption to the critical services that are vital to the efficient operation of the financial system. Under the SAR, the Bank has the power of direction over an FMI administrator, having regard to the public interest in protecting and maintaining public confidence in that system. HMT may also designate certain service providers of recognised payment systems and CSDs as eligible for the SAR. In July 2018, HMT made such a designation in respect of VocaLink in connection with its provision of services to the operators of FPS, Bacs and LINK.⁽¹⁰⁾

2.5.3.3 CSDR data reporting

The EU Central Securities Depositories Regulation (CSDR), passed into law on 23 July 2014, introduced a requirement on firms, from July 2019, to report quarterly data to the Bank on settlement activity carried outside CSDs ('internalised settlement'). The Bank has written to UK firms to make them aware of this future requirement. The data will enable the Bank to identify, monitor and manage the risks related to internalised settlement for the first time.

2.5.4 Emerging financial technology in FMIs

The Chancellor of the Exchequer launched the Cryptoassets Taskforce in March 2018. This joint Bank, HMT and FCA taskforce was created to consider the potential benefits and challenges of the application of distributed ledger technology (DLT) in financial services, including in FMIs, and to assess what, if any, regulation is required in response. The Taskforce published a report in October 2018.⁽¹¹⁾

The final report sets out that the Bank is alert to potential issues related to cryptoassets as part of its supervision of FMIs. As noted in last year's *Annual Report*, the Bank has already worked with HMT to widen the regulatory perimeter to include non-interbank payment systems through the Digital Economy Act 2017. This means that a payment system, including one based on DLT or whose users are not banks, can be recognised by HMT and thus brought under the Bank's supervision, if it becomes systemically important to the UK financial system. Moreover, if an FMI proposes to use cryptoassets or DLT in its core clearing, payments or settlement system, this would be addressed as part of the Bank's existing supervisory approach. In each case, the FMI would be expected to show how the use of cryptoassets or DLT satisfied relevant regulatory requirements and existing supervisory expectations.

More broadly, the Bank is also considering the future of payments as part of the Future of Finance project, which explores what the financial system of the future might look like, and what it means for the Bank's priorities.⁽¹²⁾ This will culminate in a report that will include a set of implications for how the Bank can support the UK's evolving financial sector landscape while continuing to meet the Bank's main objectives of maintaining monetary and financial stability.

(9) www.legislation.gov.uk/ukxi/2018/833/note/made. www.legislation.gov.uk/id/ukxi/2018/833. Transitional provisions apply in the case of UK-based CSDs in the process of applying for CSDR authorisation.

(10) www.legislation.gov.uk/ukxi/2018/858/pdfs/ukxi_20180858_en.pdf?_sm_au=iVV0JWRvs4jZrr36.

(11) www.gov.uk/government/publications/cryptoassets-taskforce.

(12) www.bankofengland.co.uk/research/future-finance.

Box 2

Building the next generation of payments infrastructure

A number of significant changes have been under way in 2018 to renew the infrastructure supporting payments in the UK. The Bank is renewing its RTGS infrastructure that holds accounts for banks, building societies and other institutions; Visa Europe has completed a system migration of its core authorisations, clearing and settlement systems to a global platform following its acquisition in 2016 by Visa Inc.; LINK has been undertaking a competitive tender for its infrastructure; and Pay.UK has started work designing and developing the new payments architecture for retail payments which will in due course replace the current Bacs and FPS systems.

These changes present both opportunities and risks for the Bank's objectives. They provide an opportunity to ensure that the infrastructure supporting payments is able to remain resilient in a fast-changing environment which includes evolving cyber risks and market innovations. However, they could also create risk if the change programme is not well managed.⁽¹⁾ The Bank expects a payment system operator to ensure that any new infrastructure continues to deliver critical payment services in a robust, resilient and secure manner as well as enhancing resilience, for example by strengthening the payment system's ability to withstand evolving cyber risks and adapt to a changing payments landscape. The payment system operator should ensure a robust approach to migration to the new infrastructure that minimises risk of discontinuity or degradation in service. It should also put in place arrangements which enable it to appropriately manage the ecosystem and to exercise robust oversight of outsourced service providers. These outcomes form the basis of the Bank's assessment of the proposals for infrastructure changes.

The Bank expects firms to consider these outcomes at all stages of the development process from design through to delivery and it will assess the infrastructure projects at key decision points, such as: when the design principles are agreed; the procurement strategy is approved; and the building and testing plan is developed.

(1) See speech by David Bailey (FMI Directorate, Executive Director); www.bankofengland.co.uk/-/media/boe/files/speech/2018/the-journey-to-best-in-class-payments-speech-by-david-bailey.pdf.

Chapter 3: Report on the Bank's supervision of FMIs over the past year

The Bank meets its financial stability objective by supervising FMIs to internationally agreed standards. Over the course of 2018, the Bank has continued its strong focus on operational and financial resilience and engaged with FMIs on their contingency plans for EU withdrawal. This chapter sets out the key supervisory activities of 2018 as well as the main FMI policy and research work that was undertaken in parallel.

3.1 Management and governance

The management and governance of a firm is critical to its safe and effective operation. The board of an FMI sets its overall strategy and is ultimately responsible for it meeting its regulatory requirements and managing its risks effectively. Therefore, the Bank places a strong emphasis on ensuring that FMIs' boards are appropriately structured and have the right skills to carry out these roles effectively, including by holding the executive to account.

The Bank views the effective governance of FMIs as a critical component in safeguarding its resilience. In line with this, the Bank has carried out governance reviews across five supervised FMIs over the past year. These reviews resulted in recommendations that set out where enhancements could be made by the respective FMIs.

3.1.1 Payment system Code of Practice and Supervisory Statement on governance

In June 2018, the Bank's Code of Practice and Supervisory Statement on Governance came into force for all RPSOs except those that are operated by a recognised clearing house (RCH) or a CSD.⁽¹³⁾ In 2018, the Bank has undertaken governance assessments on several payment systems which took into account the new Code of Practice. These reviews focused on the important role that boards of payment systems play in setting a clear strategy and risk appetite and whether boards have a good balance of skills and experience as well as clear lines of accountability within group structures. Finally, it sought evidence that boards operate independently and hold the executive to account. Recommendations were made to the individual FMIs based on the findings of these reviews.

3.1.2 Interview with FMI candidates for key roles

Recognising the important role that board members play in ensuring that risks to which an FMI is exposed are sufficiently mitigated, the Bank has continued its programme of assessing candidates' suitability and competence for key governance roles within FMIs. This year, the Bank has assessed 18 candidates for roles within FMIs.

3.1.3 Three lines of defence

Having an effective three lines of defence is a key component of a well-managed FMI and enables it to identify, manage and mitigate the risks to its business and the wider ecosystem. An effective three lines of defence includes robust management controls in the first line; a second line risk function which has oversight over and manages the risk framework and provides challenge to the first line; and a third line audit function providing independent assurance. This is a key area of focus for the Bank's supervision of FMIs. To ensure that the three lines of defence operate effectively at the FMIs it regulates, the Bank has continued to assess risk and audit functions, and evaluate key appointments to these functions. The Bank also undertook reviews of enterprise risk management frameworks of three FMIs. Finally, where supervisory reviews and assurance work indicated it was appropriate, the Bank has asked some FMIs to implement changes in risk functions or update risk frameworks.

(13) www.bankofengland.co.uk/-/media/boe/files/financial-stability/financial-market-infrastructure-supervision/code-of-practice-relating-to-governance-of-recognised-payment-system-operators.

3.2 Supervision of FMI resilience

As explained in Chapter 1, FMIs are highly interconnected with the financial system. Vulnerabilities in FMIs can spread to the financial system through these interconnections and therefore the resilience of FMIs is important for the resilience of the financial system. The Bank supervises FMIs' resilience against a broad and evolving range of risks.

3.2.1 Operational resilience

Operational resilience refers to the ability of firms, FMIs and the sector as a whole to prevent, respond to, recover and learn from operational disruptions. The challenges for operational resilience have become even more demanding given a complex cyber environment and large scale technological changes. Operational resilience is therefore a vital part of protecting the UK's financial system, institutions and consumers. As recent disruptive events within the financial services sector have shown, the speed and effectiveness of communications with the people most affected, including customers, are an important part of any firm's or FMI's overall response to an operational disruption.

In July 2018 the Bank, in collaboration with the PRA and FCA, published a discussion paper on operational resilience.⁽¹⁴⁾ This recognised how operational disruption can impact financial stability, threaten the viability of individual firms and FMIs, and cause harm to consumers and other market participants in the financial system. Firms and FMIs need to consider all of these risks when assessing the appropriate levels of resilience within their respective businesses.

Supervisory engagement with, and responses received from FMIs, along with those received by the PRA and FCA, have given the Bank valuable and constructive input to its policy development in this area. The Bank will say more on this in due course.

3.2.1.1 Operational resilience stress testing

In addition to the general microprudential framework on operational resilience, the Bank is currently investigating the use of stress testing to assess firms' and FMIs' ability to continue providing services to the financial system in severe but plausible situations, within an impact tolerance for cyber disruptions set by the FPC.

As set out in the June 2018 *Financial Stability Report*, the Bank plans to launch a pilot of the approach to stress testing in 2019.⁽¹⁵⁾ As part of this the Bank will determine how FMIs will be included in scope of this test.

3.2.1.2 Cyber resilience

CBEST is a framework to deliver controlled, bespoke, intelligence-led cyber security tests, and it plays an important part in the ongoing focus on cyber resilience. In 2015 the FPC recommended that firms at the core of the UK financial system complete CBEST tests and adopt individual cyber resilience action plans. The Bank has now completed initial cyber resilience assessments for the relevant UK FMIs in order to deliver the FPC recommendation. In 2018, the Bank implemented the CBEST framework as a component of regular cyber resilience assessment of the UK financial system. The Bank will communicate the thematic results of CBEST assessments to individual FMIs to help improve the resilience of the financial services sector. The Bank has also been working in consultation with international regulatory bodies to align cyber resilience frameworks in order to maintain consistency across relevant jurisdictions. This development should reduce the regulatory burden on institutions that operate on a cross-border basis while still delivering a realistic view of an organisation's cyber resilience.

The Bank has also completed a thematic review of UK FMIs adherence with CPMI-IOSCO's 2016 cyber resilience guidance, with the aim of taking stock of progress towards implementation and improving the resilience of the FMI sector by promoting instances of emerging good practice and highlighting those areas requiring further improvement. The review concluded that UK FMIs have continued to maintain their focus on enhancing their

(14) www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/discussion-paper/2018/dp118.pdf?la=en&hash=4238f3b14d839ebe68efbd6b5e5634fb95197d8a.

(15) www.bankofengland.co.uk/financial-stability-report/2018/june-2018.

cyber resilience and highlighted widespread evidence of observance of the guidance. In particular, progress has been made in relation to strengthening governance arrangements, enhancing awareness and understanding of cyber risk as well as incident response and recovery capabilities. The Bank acknowledges FMIs' ongoing work to further enhance IT infrastructure capability and the oversight of third-party providers.

3.2.1.3 IT resilience

The Bank undertook a thematic review of the IT infrastructure resilience of recognised payment systems in 2018. The review scope included examination of IT resilience (including data centre resilience), IT disaster recovery frameworks, IT business continuity risk scenario planning, IT disaster recovery testing, arrangements to support recovery from incidents and interdependencies of infrastructure. The Bank's findings and recommendations were fed back to the FMIs involved.

3.2.1.4 Operational incidents

The importance of having an emphasis on the resilience of FMIs was demonstrated through two separate operational incidents in 2018 at recognised payment systems:

- (a) A partial service disruption of the Visa Europe card authorisations system on Friday 1 June 2018 prevented many customers from using their debit and credit cards.⁽¹⁶⁾ The partial service disruption lasted for ten hours and affected 2.4 million of the 27.6 million Visa transactions that were attempted on UK-issued cards during that time.
- (b) On 8 July 2018, FPS experienced intermittent issues which resulted in payment processing being delayed during a four and a half hour period. The vast majority of delayed payments were completed during the subsequent days and Pay.UK (owner of Bacs and FPS) assured customers that none of the obligations would remain unsatisfied as a result of a late payment.⁽¹⁷⁾

The Bank followed its established procedures for dealing with such incidents, including facilitating cross-authority sharing of information; close monitoring and ongoing assessment of the situation in case further action by the Bank (and other authorities) was required.

3.2.2 Financial resilience

FMIs need to be resilient against the financial risks to which they are exposed. The Bank expects FMIs to demonstrate that they meet at least the baseline level of financial resources required by the PFMI (and other applicable regulations) to withstand extreme but plausible market events. For example, CCPs are required to protect themselves against financial risk posed by their clearing members through 'loss-absorbing' resources, which are based on contributions from clearing members (collateral posted to meet margin and satisfy default funds) and the CCP's own equity capital.

In 2018, the Bank completed a targeted evaluation of CCPs' self-assessments against the guidance on resilience of CCPs issued by CPMI-IOSCO published in July 2017.⁽¹⁸⁾ The Bank found that CCPs' financial risk management frameworks were broadly consistent with the new guidance. A small number of areas were identified which require further work, and the Bank is currently working with CCPs to address these. More broadly, the Bank will continue to review CCPs' assessments of compliance with the PFMI (including how they address any additional guidance) on a regular basis.

CCPs are reliant on risk models to quantify the level of financial resources they need to operate safely. Therefore, a CCP needs strong model governance in place which sufficiently documents the steps taken to ensure the quality of its models over time. In 2018, the Bank performed a cross-CCP review which focused on the quality of model governance and how it compares between CCPs. By performing this review, the Bank was able to identify areas of improvement which were communicated to CCPs involved.

⁽¹⁶⁾ <https://www.visaeurope.com/newsroom/news/visa-service-disruption>.

⁽¹⁷⁾ <https://www.newpso.uk/intermittent-faster-payments-service-issue-on-sunday-8-july/>.

⁽¹⁸⁾ www.bis.org/cpmi/pub/d163.pdf.

Box 3

EU withdrawal

Preparing for EU withdrawal has been a significant focus of the Bank's work on FMIs over the past year. A key priority has been to ensure continuity of essential payment, clearing and settlement services in the event that the UK leaves the EU without a withdrawal agreement on 29 March 2019. The Bank has worked closely with affected UK FMIs to ensure they have robust contingency plans in place; and both the UK and the EU have taken legislative steps to avoid disruption to cross-border services in a no-deal scenario.

The Bank has also worked closely with HMT to ensure that the domestic regulatory framework for FMIs is fully effective from the point at which EU law ceases to apply in the UK. This includes preparing for the Bank's new responsibilities after EU withdrawal, including for recognising non-UK FMIs that either currently operate or may in future wish to operate in the UK.

Good progress has been made across all these strands of work, such that the UK FMIs and the Bank in its capacity as FMI supervisor are well-prepared for EU withdrawal, irrespective of the form it takes. This box provides more detail on the specific steps taken by the Bank, and the FMIs it supervises, to prepare for the EU withdrawal. The Bank will continue to work closely with UK FMIs and other domestic and EU authorities to monitor and mitigate FMI-related risks in this area.

FMI contingency planning

Throughout the year the Bank has worked with the FMIs it supervises to identify potential risks to their operations resulting from EU withdrawal. This work has focused primarily on risks that could arise if the UK leaves the EU without a withdrawal agreement in March 2019. It has also informed the ongoing work of the FPC to assess the cliff-edge risks that could arise in a no-deal scenario.⁽¹⁾

The Bank has expected UK FMIs whose operations will be affected by EU withdrawal to develop and maintain robust contingency plans, covering in particular the legal, operational and financial risks that could threaten their ability to maintain continuity of service to members and other users. This includes ensuring that they have adequate operational capacity and (where relevant) financial resources to absorb increased volumes and price volatility in response to market events. The Bank has reviewed and challenged UK FMIs' contingency plans on a regular basis, including to ensure that the FMIs take timely steps to address identified risks where it is possible for them to do so in a way that supports financial stability. This includes verifying that operational changes are suitably tested and that rulebook amendments are legally robust.

One specific risk identified by the Bank in 2018 was that UK CCPs might not be able legally to provide clearing services in the EU immediately after a no-deal Brexit. The FPC — in its Brexit checklist — highlighted this risk as a potential threat to financial stability throughout 2018.⁽²⁾ The FPC noted that, in the absence of sufficient clarity that UK CCPs would be permitted to continue to provide clearing services to EU clearing members in a no-deal scenario, the derivatives (and other) contracts that these members had cleared with UK CCPs would need to be closed-out or transferred prior to the end of March 2019.

As of November 2018, the FPC reported that EU counterparties had cleared derivatives with a notional value of £60 trillion with UK CCPs, around three quarters of which was due to mature after March 2019.⁽³⁾ The FPC noted that the movement of a large volume of contracts in a short time frame would be costly to, and disrupt the derivatives positions of, EU businesses and could strain capacity in the derivatives market.

In this context, the Bank issued a statement on 19 December 2018 that welcomed the European Commission's adoption of temporary equivalence decisions that would — in a no-deal scenario — allow UK CCPs and CSDs to be recognised by the European Securities and Markets Authority (ESMA) with effect from 30 March 2019.⁽⁴⁾

(1) The FPC's latest assessment of the resilience of the UK financial system to Brexit is contained in the November 2018 *Financial Stability Report* (pages 17–33).

(2) See successive versions of the checklist published by the FPC in March, June, October and November 2018.

(3) November 2018 *Financial Stability Report*, page 32.

(4) www.bankofengland.co.uk/news/2018/december/boe-statement-on-equivalence-of-the-future-uk-legal-and-supervisory-framework-for-ccps-and-csds.

Recognition of UK CCPs would address the financial stability risk identified by the FPC. It would allow UK CCPs to continue to provide clearing services to their EU members, and EU banks to continue to meet their obligations to UK CCPs. It would also enable UK CSDs to continue to provide notary and settlement services for securities issued under EU law.

Following the adoption of these equivalence decisions, the Bank has worked with the relevant FMIs and EU authorities on the practical arrangements to implement the decisions. The Bank announced on 4 February 2019 that it had agreed MoUs with ESMA regarding co-operation and information-sharing arrangements in respect of UK CCPs and CSDs that would enter into effect in a no-deal scenario.⁽⁵⁾ The MoUs fulfil a necessary condition for recognition and confirm that the Bank will provide information to ESMA in line with its current obligations and those set out in the equivalence decisions. ESMA has stated publicly that it aims to adopt recognition decisions for UK CCPs and CSDs well ahead of the UK's withdrawal from the EU.⁽⁶⁾

The equivalence decisions adopted by the European Commission complement legislative steps taken by the UK Government to introduce temporary arrangements that will allow non-UK FMIs to continue to provide services to UK firms and markets in a no-deal scenario.⁽⁷⁾ These arrangements (discussed further below) remove the risk of disruption — to the FMIs and their users — that could otherwise result from an inability to provide services in the UK after March 2019.

On-shoring EU legislation

Most of the current regulatory framework for UK CCPs and CSDs is specified in directly applicable EU law: primarily EMIR and the CDSR respectively. UK legislation regarding settlement finality is also based on EU law. Another key priority for the Bank during 2018 has therefore been to ensure continuity of the regulatory framework for FMIs in the context of the UK Government's programme for 'on-shoring' EU law at the point it ceases to apply in the UK.

The European Union (Withdrawal) Act 2018 (the Act) converts directly applicable EU law into UK law, and preserves domestic law that relates to EU membership. The Act also provides Government ministers powers to make changes to correct deficiencies arising out of the UK withdrawal from the EU so that it continues to operate effectively. The Bank has offered ongoing support to HMT to help identify areas where changes are necessary. Statutory instruments pertaining to all FMI-related legislation have now been laid before Parliament.⁽⁸⁾

HMT has delegated powers under the Act to the Bank to address deficiencies in the binding technical standards (ie EU subordinate legislation) applicable to FMIs. The powers delegated to the Bank under the Act can only be used to fix 'deficiencies' that arise as a result of EU withdrawal (although the Bank will also gain a 'technical standards' power that will enable it to create standards within the powers conferred on it under onshored EU law). The Bank published a consultation paper in October 2018 detailing how it proposes to remedy deficiencies in FMI-related binding technical standards that arise as part of the on-shoring process.⁽⁹⁾ The FMI consultation supplemented a broader Bank/PRA consultation paper (published at the same time) that described the Bank's overall approach to amending financial services legislation under the Act, including how it would use the temporary transitional power proposed by HMT as a means of allowing regulated firms, including FMIs, to adjust to changes to regulatory requirements as a result of on-shoring EU law.⁽¹⁰⁾

The Bank will publish a policy statement in the first quarter of 2019 responding to feedback on both consultation papers. This will include the statutory instruments that would come into force if the UK leaves the EU without a withdrawal agreement.

(5) www.bankofengland.co.uk/news/2019/february/bank-of-england-and-european-securities-and-markets-authority-agree-memoranda-of-understanding.

(6) https://www.esma.europa.eu/sites/default/files/library/esma71-99-1107_esma_agrees_no-deal_brexit_mous_with_the_bank_of_england_for_recognition_of_uk_ccps_and_the_uk_csd_0.pdf.

(7) <https://www.gov.uk/government/collections/financial-services-legislation-under-the-eu-withdrawal-act>.

(8) <https://www.gov.uk/government/publications/draft-over-the-counter-derivatives-central-counterparties-and-trade-repositories-amendment-etc-and-transitional-provision-eu-exit-regulations/draft-over-the-counter-derivatives-central-counterparties-and-trade-repositories-amendment-etc-and-transitional-provision-eu-exit-regulations>.

(9) www.bankofengland.co.uk/paper/2018/uk-withdrawal-from-the-eu-changes-to-fmi-rules-and-onshored-binding-technical-standards.

(10) www.bankofengland.co.uk/paper/2018/the-boes-approach-to-amending-financial-services-legislation-under-the-eu-withdrawal-act-2018.

New responsibilities

As a result of EU withdrawal, certain regulatory responsibilities currently exercised by EU authorities such as ESMA will be reassigned to the relevant UK authority. The Bank will, for example, become responsible for defining the set of instruments that will be subject to mandatory clearing in the UK. The Bank will also assume responsibility for recognising non-UK (usually referred to as 'third-country') FMI's that wish to provide services in the UK. This is a significant additional responsibility that could involve the Bank recognising more than 40 non-UK FMI's.

The new UK legislative framework for recognising third-country FMI's is based on existing EU regimes (set out in EMIR and the CSDR) with the necessary modifications to reflect the specific responsibilities of the UK regulatory authorities. This legislation will enable the Bank to recognise non-UK CCPs and non-UK CSDs wishing to offer services in the UK subject to HMT having assessed the CCPs' and the CSDs' jurisdictions' rules as equivalent to those of the UK and certain other requirements. The legislation would also create, for the first time, the possibility of FMI's operating under non-UK law while also benefiting from UK settlement finality protection, and give the Bank the power to extend protection to collateral security provided to certain non-UK central banks. This will ensure that payments to the FMI's can be protected from challenges in the event of the insolvency of one of the participants, helping to bolster their resilience and reduce risks to other participants.

As noted above, the legislation also creates a temporary recognition and transitional regime which will allow non-UK CCPs and CSDs to continue providing services, pending recognition by the Bank. This provides confidence that these services can continue — without interruption — in the event the UK leaves the EU without a withdrawal agreement on 29 March 2019.⁽¹¹⁾ Similarly HMT has also laid legislation that would permit EEA FMI's to receive temporary settlement finality designation in a no-deal scenario, providing continuity for EEA FMI's and their UK participants. Finally, HMT has laid legislation that creates a run-off regime for CCPs that do not enter the temporary recognition regime or who cease to be part of that regime without being granted recognition to allow UK members to close out positions in an orderly way after withdrawal.⁽¹²⁾

The Bank has set out how it will apply its new responsibilities for recognising non-UK FMI's including the proposed fees for certain applications via a range of publications, letters and practical guidance.⁽¹³⁾ Interim lists of the FMI's that have made notifications to the Bank to enter the temporary/transitional regimes have been made available online.⁽¹⁴⁾ The Bank has also engaged bilaterally with FMI's that have indicated their intention to apply for recognition as well as with HMT on the necessary equivalence assessments. This work will continue in 2019.

(11) www.bankofengland.co.uk/eu-withdrawal/information-on-the-effect-of-the-uks-withdrawal-from-the-eu-on-fmi-supervision.

(12) <https://www.gov.uk/government/publications/draft-financial-services-contracts-transitional-and-saving-provision-eu-exit-regulations-2019/the-financial-services-contracts-transitional-and-saving-provision-eu-exit-regulations-2019-explanatory-information>.

(13) www.bankofengland.co.uk/eu-withdrawal/information-on-the-effect-of-the-uks-withdrawal-from-the-eu-on-fmi-supervision.

(14) www.bankofengland.co.uk/eu-withdrawal/information-on-the-effect-of-the-uks-withdrawal-from-the-eu-on-fmi-supervision.

In addition to this, the Bank conducted core assurance reviews on a number of CCPs' services, including their: process for calculating margin and default fund requirements; risk management capabilities with respect to liquidity risk; and collateral management. The Bank has provided feedback to CCPs and has set out its expectations for the remediation of any issues identified.

The Bank also undertook a cross-firm analysis of both the capital positions and business models of the CCPs it supervises. The former focused on the scope and coverage of the capital requirements specified in EMIR.⁽¹⁹⁾ The latter focused on areas such as the structure of CCPs' income statements; the principal sources of both revenue and expenses; and the relative reliance on in-house or outsourced services and staff. Both studies were intended as exploratory initial assessments, and the findings will be followed up over the course of 2019.

The Bank also conducted a thematic review of indirect clearing. This is an arrangement whereby, in order to access clearing services, a firm may establish 'indirect' clearing arrangements with a clearing member. The purpose was to achieve a view of the size and potential risks posed to CCPs from such indirect clearing arrangements, and also to ascertain the level of visibility CCPs have in identifying and monitoring such arrangements. Once it has provided the results of its assessment to individual CCPs, the Bank will continue to monitor the growth of indirect clearing services through its ongoing supervision.

3.3 Domestic and international FMI policy development

In 2018, the Bank has been involved in significant policy developments across the FMI landscape. Domestically, the Bank supported HMT in bringing onto the UK statute ('on-shoring') EU legislation that relates to FMIs, prepared for new responsibilities under this on-shored EU law, and established a framework to allow third-country FMIs to offer services in the UK post EU withdrawal. For more information, see Box 3.

Internationally, the Bank co-led a key piece of consultative work that assessed the incentives to clear derivatives products by financial market participants which resulted in recommendations to undertake further work in areas for potential reform. Further detail is contained in Box 6.

3.3.1 Policy work within CPMI-IOSCO and the FSB

The Bank continues to participate in international groups which promote the effective interpretation and implementation of the PFMI and related policies. As part of this, the Bank is actively engaged as a member of the CPMI-IOSCO's Policy Standing Group and the Implementation Monitoring Standing Group. Additionally, the Bank is a contributing member of several other CPMI-IOSCO and FSB working groups which progress the international development and effective implementation of FMI-related policy.

In addition to participating in 'fire drills' where CCPs test their default management processes, the Bank is participating in the CPMI-IOSCO working group which is looking at processes and practices for CCP default management auctions. Work so far has covered discussion with industry in respect of how a CCP may choose to auction a defaulting member's portfolio(s) to raise funds in the event of a default, given that specific rules and preferred processes can vary from one CCP to the next. The group will assess its next steps in 2019 including whether any further guidance is required on this topic to ensure the effectiveness of default management processes.

The Bank uses data from trade repositories (TRs) for a range of activities (more detail in Section 3.4). The Bank has continued to be directly involved in the work led by CPMI-IOSCO to develop global standards on the harmonisation of over-the-counter (OTC) derivatives data elements reported to TRs. In April 2018, CPMI-IOSCO published technical guidance on the definition, format and allowable values of critical data elements (CDE), other than the Unique Transaction Identifier (UTI) and the Unique Product Identifier (UPI).⁽²⁰⁾ The Bank has also been co-leading the CDE sub-stream of the CPMI-IOSCO Harmonisation working group which, in August 2018, produced a consultative report on CDE governance.⁽²¹⁾ Furthermore, the Bank continued to be an active participant

(19) EMIR RTS No 152/2013 — Articles 1–5.

(20) www.bis.org/cpmi/publ/d175.pdf.

(21) www.bis.org/cpmi/publ/d182.pdf.

Box 4

Supervisory stress testing

An important element of the supervision of CCPs' financial resilience is to ensure that CCPs can withstand extreme market events. CCPs' internal stress-testing frameworks are designed to test their own resilience to certain adverse financial risk scenarios, but are not designed to test the resilience of the entire network including their clearing members. Supervisory stress testing (SST) is conducted by one or more authorities, rather than CCPs themselves, and is intended to test the systemic, macro-level impact of extreme market events that affect multiple CCPs at the same time. These exercises provide valuable information to supervisors on the potential impact of shocks and help them to better understand the linkages between CCPs and the wider financial system.

CPMI-IOSCO published a framework for supervisory stress testing of CCPs in April 2018.⁽¹⁾ The Bank co-led a subgroup which developed this framework, which provides guidance for authorities in the design and implementation of stress tests that analyse, from a financial stability perspective, the collective response of multiple CCPs to a common stress event.

The Bank is using the CPMI-IOSCO framework to develop a SST regime for UK CCPs. It is also leveraging its expertise from a more developed process for testing the resilience of the UK banking sector using stress tests. Additionally, it is considering the UK CCPs' participation in ESMA's stress-testing exercises at European level, and the CCP stress tests conducted by the Commodity Futures Trading Commission (CFTC).

This new regime will help the Bank to examine the potential impact of hypothetical stress scenarios on UK CCPs and to assess the resilience of the UK clearing system. It will also enhance the Bank's capability to evaluate financial stability risks arising from the interdependencies between CCPs, their participants and other financial service providers.

CCPs' activities, and the financial stability risks associated with them, differ substantially to those of banks and other financial institutions. This means that each aspect of the new SST regime must be carefully designed to ensure that it is fit for purpose for testing the resilience of the UK clearing system.

To ensure that this is the case, the Bank intends to develop its internal CCP supervisory stress-testing approach in 2019, prior to finalising and publishing the supervisory stress-testing regime for UK CCPs in due course.

(1) www.bis.org/cpmi/publ/d176.pdf.

Box 5

Default management: simulations and fire drills

In addition to having sufficient financial resources to ensure their safe operation, CCPs are required to ensure they have appropriate processes and procedures in place to minimise the financial risks arising from the default of clearing members, when the member is no longer able to meet its commitments to the CCP. A CCP's default management process has an integral role in reducing counterparty risk to the CCP, minimising losses to non-defaulting clearing members, and thereby ensuring that financial markets continue to operate smoothly.

CCPs are required to test their default management processes (typically referred to as 'fire drills') regularly to ensure that they are operationally prepared and that clearing members have a familiarity with the processes. These can include small and frequent drills targeted at particular product lines and annual CCP-wide drills across multiple service lines. CCPs' annual fire drills will generally include multiple aspects of the default management process, such as seconding traders from clearing members to advise on hedging strategies, testing clearing members' ability to ingest information on the portfolio of the defaulted counterparty, simulation of bidding at auctions for this portfolio, and allocation of any resultant losses via the CCP's default waterfall.

Supervisors of CCPs must also be prepared to react quickly when notified that a CCP is planning to place a clearing member into default, to ensure that both the lead supervisor and the College of supervisors have sufficient insight into the progress of risk-mitigating actions being undertaken by the CCP, and to monitor the risk of any contagion to the broader financial markets and other infrastructures. This is in addition to supervisors' responsibility to review and ensure the adequacy of CCPs' own default management procedures.

In 2018 the Bank of England ran several exercises simulating the scenario of the CCPs it supervises placing clearing members into default. These included:

- An internal simulation of the default of a single large clearing member across all three UK CCPs simultaneously, with the Bank undertaking all necessary steps from analysis of potential losses to the CCPs through to supervisory decision-making and action.
- Simulations of individual clearing member defaults, in each case involving external participants (the College members of each CCP the Bank supervises), and testing both the Bank's and the College members' readiness for timely information sharing, discussion, analysis, and action.

Aside from undertaking its own simulations, the Bank also continued its reviews of CCPs' fire drills, which is a core component of the Bank's supervisory approach. However, since a large clearing member will likely be a member of multiple CCPs, since 2016 the Bank of England has been a part of a multi-CCP fire drill, where more than one CCP triggers its default management processes in parallel.

This year, six clearing services across the UK, France, Germany and US participated in a multi CCP fire drill: CME Inc., Eurex AG, LCH Ltd, LCH SA, ICE Clear Europe and ICE Clear Credit triggered a default management fire drill in parallel. The aims of this year's fire drills were to understand how clearing members and CCPs react to the hedging and auction processes being run in parallel across six services, and for CCPs to simulate a liquidation of a defaulted member's portfolio, assuming a stressed market environment. The Bank, in co-ordination with the supervisors of the other CCPs: L'Autorité de contrôle prudentiel et de résolution (ACPR), Autorité des marchés financiers (AMF), Banque de France, Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), Bundesbank and Commodity Futures Trading Commission (CFTC) reviewed the CCPs' procedures and auction data, and collected feedback from seven large clearing members. The test concluded successfully and the collective observations of the CCP supervisors and proposed improvements were shared across the participants.

of the FSB Working Group on UTI and UPI Governance (GUUG). The GUUG work led to the FSB second consultation document on UPI governance in April 2018 and to the FSB self-assessment questionnaire for prospective UPI Service Providers in July 2018.⁽²²⁾

The Bank has continued to be directly involved in the analysis of the joint Study Group (involving the FSB, CPMI, IOSCO and BCBS) on Central Clearing Interdependencies, which published its second report in August 2018 highlighting the interdependencies between CCPs and major clearing members from a systemic perspective.⁽²³⁾ This second report also provided evidence confirming that the findings from the first report (published in July 2017) have remained largely stable over time. This work has developed the regulatory community's understanding of the dynamics of central clearing interdependencies within financial markets.

The FSB FMI Cross-Border Crisis Management Group (fmi CBCM) has a mandate to consult on and finalise international guidelines relating to CCP resolution. These guidelines complement existing international standards relating to the resilience and recovery arrangements of CCPs. The Bank directly participates as a member of the fmi CBCM, reflecting its role as both supervisor and resolution authority for UK CCPs. Currently, the focus of the fmi CBCM's work is on the need (if any) for additional financial resources at the CCP specifically for resolution and the treatment of CCP equity in resolution. The fmi CBCM published a discussion paper in 2018 Q4 on these two topics which contains draft guidance.

The Bank is also involved in working groups of CPMI. As a direct member of the task force on wholesale payments security, the Bank contributed to the development of the strategy paper on reducing the risk of wholesale payments fraud related to endpoint security, published in May 2018.⁽²⁴⁾ The Bank has also been an active member of the working group on Digital Innovations, which contributed to the publication of a report in March 2018, jointly with the Markets Committee, on *Central Bank Digital Currencies*, and to design a survey on central bank digital currency and private digital tokens.⁽²⁵⁾

3.3.2 Policy work within European fora

In June 2017 the European Commission proposed an update to rules on CCP Supervision, known as 'EMIR 2.2'.⁽²⁶⁾ The proposal includes amendments to the current framework for the supervision of CCPs to introduce a more pan-European approach to the supervision of CCPs and has been under negotiation in the European Parliament and EU Council of Ministers throughout 2018. The Bank has continued to provide technical support to HMT in the course of the negotiations.

In May 2018, the European Parliament agreed its position and in November 2018 the EU Council of Ministers also reached an agreed position, meaning that trilogue discussions between the co-legislators and the EU Commission have now commenced. During the year the original Commission proposal has been substantially developed by these co-legislators, although the core framework remains largely the same: the development of a pan-European approach to the supervision of EU CCPs with a greater supervisory role for ESMA; and a heightened role for ESMA with respect to third-country CCPs that are judged to be systemically important for EU markets. The legislation also envisages a more defined role for the EU's central banks of issue. Finally the legislation includes a mechanism to deny recognition to third-country CCPs as a 'last resort' in certain circumstances, in which case they would only be able to provide services to EU clearing members and trading venues if they were located in the EU.

These changes could apply to UK CCPs during an implementation period and after the UK's withdrawal from the EU. The UK Government, with support from the Bank, has continued to engage with the legislative process and express concerns where it believes that the EMIR 2.2 proposal could lead to fragmentation, and is inconsistent with the global approach to the reform of derivatives markets that was envisaged by the G20.⁽²⁷⁾

(22) www.fsb.org/wp-content/uploads/P260418-1.pdf. www.fsb.org/wp-content/uploads/P160718-2.pdf.

(23) www.bis.org/cpmi/publ/d181.pdf. www.bis.org/cpmi/publ/d165.pdf.

(24) www.bis.org/cpmi/publ/d178.pdf.

(25) www.bis.org/cpmi/publ/d174.pdf. www.bis.org/publ/bppdf/bispap101.htm.

(26) EMIR 2.2 is shorthand for the following draft legislation: Regulation of the European Parliament and of the Council amending Regulation (EU) No 648/2012 as regards the procedures and authorities involved for the authorisation of CCPs and requirements for the recognition of third-country CCPs.

(27) <http://europeanmemoranda.cabinetoffice.gov.uk/files/2018/04/DOC190418-19042018184359.pdf>.

Additionally, the European Commission's EMIR Review proposal ('EMIR REFIT') was published in May 2017.⁽²⁸⁾ The proposal sets out a number of targeted modifications to EMIR, mainly to simplify the rules and make them more proportionate. Notably, EMIR REFIT will potentially allow for the clearing obligation to be suspended if necessary owing to market disruption or financial stability reasons, and will also permanently exempt small financial firms with limited derivatives activity from mandatory clearing. The Bank has continued to work alongside the FCA to provide technical support to HMT in relation to these negotiations.

The Bank attends ESMA's Post-Trade Standing Committee, which brings relevant EU authorities from EU member states together to consider post-trade regulatory matters across the EU. The Standing Committee has maintained and expanded Q&As with respect to the application of EMIR, CSDR and the Markets in Financial Instruments Regulation (MiFIR). The Bank is also part of ESMA Task Forces working to develop Q&As on the implementation of the CSDR and further develop the EU CCP stress-testing methodology.

3.4 FMI-related data

The Bank requests a range of data from the population of supervised FMIs to inform supervisory judgements and policy development. In addition to data received from supervised FMIs, the Bank receives and uses trade-level derivatives data from TRs as reported under EMIR.

During the course of 2018, a notable use of FMI data has been to support the Bank and FPC's assessment of the potential risk to the continuity of cross-border derivative contracts resulting from the UK's withdrawal from the EU. The TR data set allows the Bank to identify and regularly monitor a range of relevant metrics related to contractual continuity risk, such as, the maturity profile and type of the derivatives positions that EU members have with UK CCPs and the scale of the non-centrally cleared derivatives exposures between UK and EU firms, broken down by Member State. This data set was used in the latest *Financial Stability Report* (November 2018) to estimate the amount of cross-border derivative contracts exposed to continuity risk and support the FPC's assessment of the financial stability impact of leverage from the use of derivatives in the non-bank financial system. Data collected from CCPs has also been supporting the regular monitoring of activity and risk metrics related to UK CCPs across all of their clearing services (not just derivatives) in the context of EU withdrawal, for example, the relative share of the initial margin posted at UK CCPs by clearing members from the UK, EU and the rest of the world.

In 2018, the Bank has also developed its data technical architecture, including for the analysis of the TR data set. The Bank expects to be able to run selected analytics on a wider subset of the TR data set during the course of 2019 and more quickly than was previously possible. In 2019, the Bank will continue to develop this architecture to expand the range of analytics available on the data platform as well as to reduce further the time that it takes to process and manipulate large subsets of the TR data set.

(28) https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-208_en.

Box 6 Incentives to centrally clear OTC derivatives

The FSB and other Standard Setting Bodies (SSBs) reconvened the Derivatives Assessment Team (DAT) in 2017 to re-examine whether adequate incentives to centrally clear OTC derivatives are in place further to the implementation of G20 post-crisis reforms.⁽¹⁾ This working group was co-chaired by the Bank of England and in November 2018 published its report which combined analysis from pricing and qualitative survey data collected from cross-region industry participants.

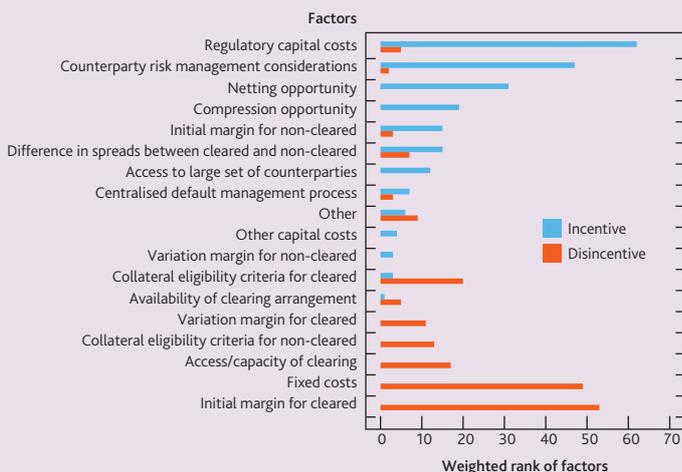
The report set out a number of findings on the effects of individual reforms and their interaction. Broadly, it found that the post-crisis reforms, particularly those relating to clearing, capital and margin, appear to create an incentive to centrally clear, notably for the larger participants at the core of the derivatives network, such as dealers and more active clients of clearing service providers. However, the report also found that incentives to use central clearing were not as strong for less active clients, who in many cases also experience a lower degree of access to central clearing services, the provision of which is concentrated in a small number of bank-affiliated firms.

Non-regulatory factors, such as market liquidity, counterparty credit risk management and netting efficiencies, are also important and can interact with regulatory factors to affect incentives to centrally clear.

Of the major reforms, the leverage ratio was overwhelmingly identified as having a disincentivising effect on the provision of clearing services, in particular with respect to its treatment of client initial margin taken by service providers from clients, whereby under the current framework it does not offset derivatives exposures in the calculation of the leverage exposure measure.

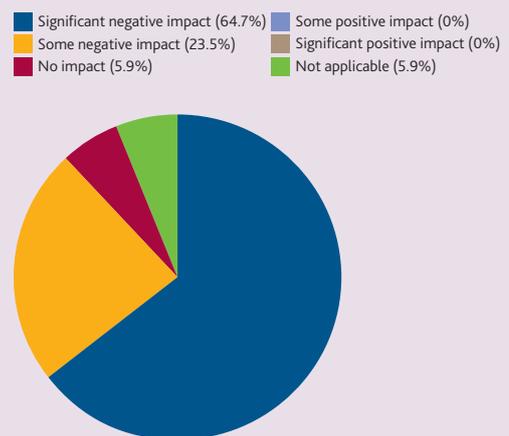
The report recommended that the SSBs consider undertaking further work in a number of areas to ensure clearing is appropriately incentivised, including on the treatment of initial margin in the leverage ratio,⁽²⁾ aspects of the G-SIB methodology, and further investigation of the economics of client clearing and access to clearing services.

Chart A The weighted rank of the top factors incentivising or disincentivising dealers from centrally clearing non-mandated derivatives products



Source: FSB DAT qualitative survey.

Chart B Effect of the leverage ratio on the ability to offer client clearing services



Source: FSB DAT qualitative survey.

(1) www.fsb.org/wp-content/uploads/R191118-1-1.pdf.

(2) In October 2018 the Basel Committee on Banking Supervision launched a public consultation on options for amendments to the treatment of initial margin in the leverage ratio; <https://www.bis.org/bcbs/publ/d451.pdf>. This consultation closed in January 2019 and the Committee is currently considering potential next steps based on the responses received.

Chapter 4: Future developments and priorities for 2019

The FMI landscape has seen significant change over the recent years. Post-crisis regulatory reforms have led to an increasingly important role for FMIs within the financial system. In addition, technological advances and the growth of fintech continue to have an impact within the FMI environment. The UK's withdrawal from the EU will also have significant implications for the UK-EU future trading relationship and for the FMI-related work that the Bank undertakes in 2019. The Bank will continue to monitor these developments to ensure that risks posed to, and by, FMIs are appropriately mitigated. This chapter outlines some of the main areas of focus for the Bank's work on FMIs in the next year.

4.1 Supervisory and policy priorities for 2019

In 2019, through its supervisory approach, the Bank will continue to identify and mitigate risks to the FMIs it supervises and the economic activities they support. This will include actively monitoring developments that could present new or increased risks through regular horizon-scanning exercises. Alongside this supervisory work, the Bank will continue to contribute to domestic and international policy discussions concerning FMIs and examine how changes in the FMI landscape could affect the effectiveness of the regulatory framework for FMIs and financial stability more generally.

4.1.1 Ongoing development and implementation of the Bank's supervisory approach to FMIs

Over 2019, the Bank will continue to carry out its supervisory activities in line with the FMI supervisory framework. This will include a range of targeted core assurance reviews, both on individual FMIs and on a thematic, cross-FMI basis. These reviews will assess how FMIs are mitigating risks across the broad range of their operations, in areas such as operational and financial resilience, and their compliance with expectations as set out in the PFMI and applicable regulations.

4.1.2 Technological change at FMIs, including the next generation of payments infrastructure

A particular area of supervisory focus will be technological change, which is a constant factor within the population of FMIs supervised by the Bank. The Bank will seek to ensure that any change carried out by the FMIs it supervises is designed and implemented in a way which promotes the resilience of individual FMIs and the broader system, in line with the Bank's supervisory expectations. This will include work undertaken to oversee the planned, structural changes within the payments landscape as set out in Box 2.

4.1.3 Operational resilience, including cyber resilience

As set out in Section 3.2.1 the Bank will continue its work to further develop its supervisory approach and policy framework for operational resilience in close collaboration with the PRA and the FCA. This follows on from the joint publication of the July 2018 discussion paper on the topic by the three authorities. As part of this, the Bank will continue to engage with firms and FMIs as well as other domestic and international authorities that focus on operational resilience.

Furthermore, as set out in the June 2018 *Financial Stability Report*, the Bank plans to launch a pilot of its approach to stress testing the financial services sector's resilience to cyber incidents in 2019, which will focus on payments. This will include relevant FMIs within its scope.

4.1.4 CCP supervisory stress testing

Section 3.2.2 highlights the Bank's supervisory expectations, which are underpinned by international regulatory standards, that FMIs are financially resilient and can withstand extreme but plausible market events. To help the Bank assess the systemic, macro-level impact of extreme market events that affect multiple CCPs at the same

time it will continue its work to develop a supervisory stress test, in line with the international framework outlined by CPMI-IOSCO, for UK CCPs.

4.1.5 Further work associated with the UK's withdrawal from the EU

The Bank will continue its work to ensure that FMIs and the Bank in its capacity as FMI supervisor are well-prepared for the UK's withdrawal from the EU, irrespective of the form it takes. This will include further work on FMIs' contingency plans, as well as policy work to ensure both the continuity of the regulatory framework for FMIs and implement the relevant changes in the Bank's responsibilities as a result of EU withdrawal. Further details on work in this area can be found in Box 3.

4.1.6 Other policy work

During 2019, the Bank will actively contribute to policy development both domestically and internationally.

Within the UK, this will include work on FMI-related aspects of the Bank's Future of Finance project.⁽²⁹⁾ This project examines how financial services might evolve over the next decade, and what this means for individuals, businesses and financial service providers. Its conclusions will help inform the Bank's thinking on future policies and capabilities.

Internationally, the Bank will engage with counterparts in the EU and globally to shape the international policy agenda on FMI-related issues, including through fora such as the FSB, CPMI and CPMI-IOSCO. For example, the Bank will participate in the CPMI-IOSCO Policy Standing Group (PSG) and contribute to ongoing work evaluating best practices for the auction mechanisms CCPs employ to close-out the positions of a defaulted member. The Bank will also support the CPMI-IOSCO Implementation Monitoring Standing Group which is tasked with reviewing implementation of the PFMI in member jurisdictions.

4.2 FMI data

The Bank uses a range of FMI data to deliver its supervisory and policy functions and contribute to financial stability outcomes. As set out in Section 3.4, there have been a number of developments in the Bank's use of FMI-related data in 2018. Over the course of 2019, the Bank will continue to enhance its use of FMI data as well as working alongside international counterparts on the harmonisation of data standards.

In 2019, the Bank will develop its approach to reporting under the CSDR. The CSDR will require all UK firms that settle securities transactions outside a CSD ('internalised settlement') to provide to the Bank quarterly aggregated reporting of the volumes and values of these securities transactions.

(29) www.bankofengland.co.uk/research/future-finance.

Annex 1: FMIs and specified service providers supervised by the Bank and key supervisory legislation to which they are subject

Central counterparties (CCPs) are regulated under **FSMA** as recognised clearing houses (**RCHs**) and under **EMIR**. The embedded payment systems of LCH Ltd and ICE Clear Europe are also both recognised payment systems under the **Banking Act 2009**.

ICE Clear Europe Limited	Clears a range of exchange-traded derivatives and OTC credit default swaps.
LCH Limited	Clears a range of repos, exchange-traded and OTC securities and derivatives.
LME Clear Limited^(a)	Clears a range of metal derivatives traded on the London Metal Exchange, and OTC metal contracts.

Payment systems meeting defined criteria may be recognised by HM Treasury. Recognised payment systems are supervised by the Bank under the **Banking Act 2009**.

Bacs^(b)	Operated by Bacs Payment Schemes Limited, processes higher-volume and lower-value payments, such as salary, benefit, Direct Credit and Direct Debit payments.
CHAPS^(c)	Operated by the Bank of England, the CHAPS system is the United Kingdom's high-value payment system, providing real-time gross settlement of sterling transfers between participants.
CLS	Operates the world's largest multicurrency cash settlement system for foreign exchange transactions in 18 currencies, including sterling.
Faster Payments Service (FPS)^(b)	Operated by Faster Payments Scheme Limited, processes standing orders and electronic retail transactions, including transactions generated in internet, mobile and telephone banking.
LINK	LINK is a network of card issuers and ATM deployers which allows cardholders to use their cards to withdraw cash at any ATM connected to LINK where the ATM deployer is not the same institution as the cardholder's issuing bank.
Visa Europe	A four party card scheme and cards payments processor operating in the EEA, Israel, Turkey and Switzerland, offering debit, credit, deferred debit and prepaid card products.

Specified providers may be specified by HMT where their service(s) are determined to form part of the arrangements constituting a recognised payment system. Specified service providers are supervised by the Bank under the **Banking Act 2009**.

VocaLink	VocaLink is a technology company that designs, builds and operates IT infrastructure for payment systems and ATM switching platforms. In April 2018, HMT formally specified VocaLink as service provider to Bacs, FPS and LINK, by amending their recognition orders, bringing VocaLink formally under the direct supervision of the Bank.
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Securities settlement systems may be regulated under **FSMA** as RCHs and are subject to the **Uncertificated Securities Regulations 2001** in the United Kingdom. Euroclear UK and Ireland Limited operates the CREST system, which is also a recognised payment system under the **Banking Act 2009**.

Euroclear UK & Ireland Limited (EUI) CREST	EUI operates the CREST system — the securities settlement system for UK gilts and money market instruments, as well as UK equities — which settles on a gross delivery versus payment basis (EUI also operates CREST for the purposes of settling Irish equities).
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(a) LME Clear Limited is authorised under EMIR to clear both OTC and listed metal contracts, but it currently only clears listed contracts.

(b) Bacs and FPS are owned by Pay.UK.

(c) The Bank's FMI Directorate continues to supervise the CHAPS system to the same standard as recognised payment systems even though it was derecognised by HMT in December 2017 to reflect the fact that it is now operated by the Bank.

Annex 2: FMI data

Recognised payment systems and securities settlement system^(a)

		Volume		Value (£ millions)		Number of settlement bank members	Operational availability ^(b)	Important payment types
		2018	2017	2018	2017			
Bacs		26,278,549	25,187,221	19,616	19,539	25	100%	Direct Debits and Direct Credits.
CHAPS^(c)		191,788	165,285	330,095	333,661	33	99.90%	Financial markets and infrastructure, corporate treasury, other wholesale interbank, government, property completions and mortgages.
CLS^(d)	All currencies	874,612	766,303	4,370,957	4,039,717	71	99.97%	Settlement of foreign exchange transactions in 18 currencies, including sterling.
	Sterling	61,860	56,390	353,957	322,581			
CREST	Sterling	195,302	197,437	778,427	668,128	21	99.90%	Settlement of gilts, equities and money market instruments (including in respect of the Bank's open market operations and repo markets transactions more generally).
	US dollar	7,578	7,733	1,897	1,692			
	Euro	5,429	5,161	1,178	977			
	Total CREST	208,309	210,331	781,502	670,796			
Faster Payments Service		8,074,310	6,544,753	6,755	5,541	26	99.94%	Electronic transactions, including transactions generated in internet, mobile and telephone banking together with standing orders.
Link		7,993,421	8,507,406	343	355	35	100%	Withdrawing cash from ATMs deployed by entities other than the withdrawer's card issuer.
Visa Europe^(e)	All issuance	82,413,365	69,556,140	3,142	2,759	514	100%	Card payments.

(a) All value and volume data represent daily average unless otherwise stated.

(b) The data on operational availability is not comparable between firms because each firm uses its own definition.

(c) With two further payment service providers technically enabled as Direct Participants/settlement banks in CHAPS, and preparing for full participation.

(d) Operational availability for CLS is between January 2018 and November 2018.

(e) Figures represent average daily volume for the year of 2018 based on processed transaction volume.

CCPs (by default waterfall)

		Total initial margin requirement (£ equivalent, millions) ^(a)		Default fund (£ equivalent, millions) ^(b)		Number of clearing members	Operational availability of core systems	Products cleared
		2018	2017	2018 ^(c)	2017			
ICE Clear Europe	Credit default swap	5,125	4,920	781	759	23	100%	Futures and options: exchange traded energy markets (including ICE Endex, ICE Futures Europe and ICE Futures US) and the financials and softs futures and options contracts traded on ICE Futures Europe. CDS: credit default swap market.
	Futures and options	28,073	29,677	2,070	1,514	74		
LCH Ltd	Commodities ^(d)	0	82	0	14	0	99.94%	Clears a range of OTC and exchange traded interest rate derivatives, OTC FX derivatives, cash equities and equity derivatives, cash bonds and repos.
	Equities	1,999	1,714	225	186	39		
	ForexClear	4,025	3,198	1,722	1,300	32		
	RepoClear	11,083	11,051	1,170	883	88		
	SwapClear ^(e)	99,223	90,047	4,980	4,979	114		
LME Clear	LME Base	5,774	6,754	816	538	46	100%	Clears a range of base metal and precious metal derivatives traded on the London Metal Exchange.
	LMEprecious ^(f)	227	223	180	104	10		

(a) The end of day total margin requirement per default waterfall, averaged over all business days in the period.

(b) The size of the clearing member prefunded default fund, averaged over all business days in the period.

(c) ICE Default fund is average of requirement amount rather than deposit value. The 2018 figure is based on the guaranty fund requirement whereas the 2017 was based on the guaranty fund model.

(d) The CommodityClear service closed on 28 December 2017.

(e) The SwapClear line covers the SwapClear and Listed Rates services.

(f) LMEprecious was launched on 10 July 2017.

Annex 3: 2018 Annual Report commitments

2018 Annual Report section	2018 commitment	2019 Annual Report section
Box 1 Reviews of the Bank's approach to FMI supervision		
Box 1	The Bank is in the process of reviewing and articulating its objectives with regard to FMI supervision, including the understanding of systemic risk management. A package of proposals which addresses these recommendations is expected to be finalised in 2018 and the Bank's FMI supervisory approach will be updated and published after this to reflect any changes.	Box 1
Box 1	A consultation paper was published in August 2017 which proposed that the Bank levies fees on FMIs according to their systemic importance to the financial system. In this way, fees would be levied in a consistent and transparent manner and according to the potential impact of regulated FMIs on UK financial stability. The Bank's response to the fees consultation will follow in 2018.	2.5.3.1
Box 3 Supervisory stress-testing framework for CCPs		
Box 3	In light of the finalisation of the CPMI-IOSCO framework, which is expected in 2018, the Bank is considering its approach to a supervisory stress-testing regime for UK CCPs.	Box 4
3.3 Financial resilience		
3.3	The Bank is also undertaking a thematic review to assess how UK CCPs meet the updated CPMI-IOSCO expectations regarding financial risk management on an ongoing basis.	3.2.2
4.1 Supervisory priorities for 2018		
4.1	The Bank will continue its FMI core assurance reviews notably on IT resilience at payment systems and on financial risk models at CCPs.	3.2.1.3 (IT resilience), 3.2.2 (Financial risk models)
4.1.1	The Bank will undertake an operational readiness assessment of the NPSO to take on the role of operator of these systemically important payment systems.	2.5.1
4.1.2	At a sector level the Bank will conduct work on its impact tolerance for operational disruptions; this will set a defined level of operational disruption that the Bank is willing to tolerate in line with its objectives.	3.2.1.1
4.1.3	Additionally, the Bank is conducting a review of FMIs' self-assessments against the CPMI-IOSCO guidance on cyber resilience.	3.2.1.2
4.1.4	The Bank is evaluating CCPs' self-assessments against the CPMI-IOSCO guidance on CCP financial resilience which was published in July 2017 and came into force on 31 December 2017.	3.2.2
4.2 FMI policy development in 2018		
4.2.1	The Bank also continues to participate in work to monitor implementation of the PFMI . This will include peer reviews of jurisdictions' implementation of the PFMI, and thematic work to examine consistency of implementation outcomes across jurisdictions.	3.3.1
4.2.2	The work of the DAT will be informed by the use of industry surveys distributed to a wide variety of derivatives market participants and a final report is expected by end-2018 .	Box 6
4.2.4	The Bank plans to conduct thematic work on indirect clearing in 2018.	3.2.2

Annex 4: Glossary of terms

Central counterparty

An entity that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer.

Central securities depository

An entity that provides securities accounts, central safekeeping services, and asset services, which may include the administration of corporate actions and redemptions, and plays an important role in helping to ensure the integrity of securities issues (that is, ensure that securities are not accidentally or fraudulently created or destroyed or their details changed).

Collateral

An asset or third-party commitment used by a collateral provider to secure an obligation vis-à-vis a collateral taker.

Credit risk

The risk of loss due to the failure of a counterparty to perform on a contractual obligation on time and in full. Credit risk arises whenever future cash flows are due from parties who may not provide them.

Default fund

A fund consisting of assets contributed by members of a system that would be used to pay liabilities of defaulting members.

Exposure

The maximum loss that might be incurred if assets or off balance sheet positions are realised, or if a counterparty (or group of connected counterparties) fail to meet their financial obligations.

G20

The G20 group comprises 19 countries and the European Union, representing the world's largest economies, whose finance ministers and central bank governors have met periodically since 1999.

Initial margin

Collateral which is posted at the beginning of a transaction by a member to a CCP to cover potential future adverse changes in the market value of the contract and is recalculated on a regular basis.

Liquidity risk

The risk that a party does not have sufficient funds to meet an obligation when it becomes due, or can only obtain those funds at an unexpectedly high cost.

Margin

Combination of initial and variation margin.

Operational risk

The risk that deficiencies in information systems or internal processes, human errors, management failures, or disruptions from external events will result in the reduction, deterioration, or breakdown of services provided by an FMI.

Payment system

An entity enabling payments to be transferred and settled across an infrastructure according to a set of predetermined multilateral rules.

Securities settlement system

An entity enabling securities to be transferred and settled by book entry according to a set of predetermined multilateral rules. Such systems allow transfers of securities either free of payment or against payment.

Systemic risk

The risk that the inability of one or more participants to perform as expected will cause other participants to be unable to meet their obligations when due.

Trade repository

An entity that maintains a centralised electronic record (database) of transaction data.

Variation margin

Collateral which is posted during the life of a contract by a member to a CCP to cover actual changes in the market value of a contract.

Annex 5: Abbreviations used in this Report

BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCP	Central counterparty
CDE	Critical data elements
CFTC	Commodity Futures Trading Commission
CHAPS	Clearing House Automated Payment System
CHAPS Co	CHAPS Clearing Company Limited
CLS	Continuous Linked Settlement
CME	Chicago Mercantile Exchange
CMG	Crisis Management Group
CPMI	Committee on Payments and Market Infrastructures
CSD	Central securities depositories
CSDR	Central Securities Depositories Regulation
DAT	Derivatives Assessment Team
DLT	Distributed ledger technology
EEA	European Economic Area
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
EUI	Euroclear UK & Ireland Limited
FCA	Financial Conduct Authority
FMI	Financial market infrastructure
fmi CBCM	FMI Cross-Border Crisis Management
FPC	Financial Policy Committee
FPS	Faster Payments Service
FSB	Financial Stability Board
FSMA	Financial Services and Markets Act 2000
G-SIB	Global systemically important bank
GUUG	Group on UTI and UPI Governance
HMT	Her Majesty's Treasury
HVPS	High-value payment system
IEO	Independent Evaluation Office
IM	Initial Margin
IMF	International Monetary Fund
IMSG	Implementation Monitoring Standing Group
IOSCO	International Organization of Securities Commissions
LCH	London Clearing House
LME	London Metal Exchange
MiFIR	Markets in Financial Instruments Regulation
MoU	Memoranda of Understanding
NPSO	New Payment System Operator
OTC	Over the counter
PFMI	Principles for Financial Market Infrastructures
PRA	Prudential Regulation Authority
PSG	Policy Standing Group
PSR	Payment Systems Regulator
RPSO	Recognised payment system operators
RT2	RTGS Renewal Programme

RTGS	Real-Time Gross Settlement
SAR	Special Administration Regime
SEC	Securities and Exchange Commission
SFTR	Securities Financing Transactions Regulation
SI	Statutory Instrument
SSB	Standard Setting Body
SSS	Securities Settlement Systems
SST	Supervisory stress-testing
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TR	Trade repositories
UPI	Unique Product Identifier
UTI	Unique Transaction Identifier

Annex 6: List of Bank research on FMI topics published or accepted for publication

Bank Staff Working Papers

August 2018	Cenedese, G, Ranaldo, A and Vasios, M, 'OTC premia', <i>Bank of England Staff Working Paper No. 751</i> ; www.bankofengland.co.uk/working-paper/2018/otc-premia .
June 2018	Acosta-Smith, J, Ferrara, G and Rodriguez-Tous, F, 'The impact of the leverage ratio on client clearing', <i>Bank of England Staff Working Paper No. 735</i> ; www.bankofengland.co.uk/working-paper/2018/the-impact-of-the-leverage-ratio-on-client-clearing .
May 2018	Bardoscia, M, Bianconi, G and Ferrara, G, 'Multiplex network analysis of the UK OTC derivatives market', <i>Bank of England Staff Working Paper No. 726</i> ; www.bankofengland.co.uk/working-paper/2018/multiplex-network-analysis-of-the-uk-otc-derivatives-market .

External publications in refereed journals

June 2018	Benos, E and Žikeš, F, 'Funding constraints and liquidity in two-tiered OTC markets', <i>Journal of Financial Markets</i> , Vol. 39, June, pages 24–43, DOI: 10.1016/j.finmar.2018.01.002.
March 2018	Gurrola-Perez, P, 'The validation of filtered historical value-at-risk-models', <i>Journal of Risk Model Validation</i> , 12(1), pages 1–27.