The Bank of England's approach to cost benefit analysis

Statement of policy

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Content

This Bank of England Statement of Policy (SoP) sets out the Bank's approach for conducting cost benefit analysis (CBA), when making rules for CCPs and CSDs.

CBA is an integral part of good policymaking. This SoP explains how the Bank estimates costs and benefits as part of its policymaking process, and the role of regulation of CCPs and CSDs in ensuring the stability of the UK's financial system. Supported by the **CBA Panel**, CBA enhances the transparency of our policymaking and our accountability and helps us make better policies.

This SoP incorporates feedback from the CBA Panel. We now welcome feedback from all members of the public. The Bank plans a review of this Statement of Policy in 2025 Q4, which will take into account feedback from the CBA Panel, other stakeholders and any lessons learnt from future CBAs. Depending on the outcome of the review, the Bank may publish a revised Statement of Policy in 2026. Feedback should be sent to ✉ **BankCostBenefitAnalysis1224@bankofengland.co.uk** by 30 September 2025.

The PRA has also published the **PRA's approach to conducting CBA** which sets out how the PRA will conduct CBA in relation to rules for PRA regulated firms.

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The response will be assessed to inform our work as a regulator and central bank, both in the public interest and in the exercise of our official authority. We may use your details to contact you to clarify any aspects of your response.

Responses may be shared with the Financial Conduct Authority (FCA) and HM Treasury (HMT) and the PRA CBA Panel (CBA Panel). If this is the case, the other organisation will also review the responses and may also contact you to clarify aspects of your response. Responses may also be shared with the Payment Services Regulator (PSR). We will retain all responses for the period that is relevant to supporting ongoing regulatory policy developments and reviews. However, all personal data will be redacted from the responses within five years of receipt. To find out more about how we deal with your personal data, your rights, or to get in touch please visit **Privacy and the Bank of England**.

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Responses are requested by 30 September 2025.

Executive Summary

Why we do cost benefit analysis and the costs and benefits we assess

CBA is an integral part of good policymaking. Supported by the independent CBA Panel, CBA enhances the transparency of our policymaking and our accountability and helps us make better policies.

In line with our primary objective to protect and enhance the stability of the UK financial system, the most important benefit considered in CBAs undertaken by the Bank is the impact that policy change may have on financial stability, and the economic output of the UK. Our conceptual framework for measuring the financial stability benefits of FMI regulation is grounded in the extent to which regulation can reduce the expected economic cost of a financial crisis due to FMI disruption or failure.[1] The conceptual framework considers how the expected cost of a crisis can be understood through the probability of a crisis occurring, the losses it would lead to, and the value of economic output exposed.

When evaluating the benefits of FMI regulation, we also consider the direct and indirect benefits to FMIs and their market participants. For instance, with regards to our secondary objective, we consider any benefits to innovation through regulation that enables FMIs to use new technologies or ways of delivering their service that enhances efficiency, economy and quality of these services. Where regulation reduces direct costs to FMIs, this may be invested in innovation to support new and existing services. Decreased costs may attract new entrants to provide FMI services, which may increase competition in, and the resilience of, that market.

Regulation can impose costs on FMIs, which may be passed on to market participants and lead to negative market outcomes. There can sometimes be a trade-off between the costs and benefits of regulation. If too lax, regulation will impose low costs but fail to deliver the benefits described above. If too stringent, then the net benefits of regulation can reduce through high implementation costs or unintended consequences. The Bank aims to achieve FMI regulation that is neither too lax nor too stringent, where benefits exceed costs. We may recalibrate our policies from time to time in the light of experience.

How we do cost benefit analysis as part of policymaking

As part of policy development, the Bank has a structured framework for undertaking CBA that involves: developing the case for action; assessing expected costs and benefits; considering the uncertainties; and forming an overall judgement on the net impact of a policy.

The Bank takes a proportionate approach to the use of CBA in its policy making process and makes judgements about whether a CBA is required and, if so, whether it is reasonable to

estimate the expected costs and benefits of a policy proposal, using criteria set out in FSMA.

The Bank will communicate CBA as part of our public consultation process in our CPs. Final policy statements will include feedback received on the CBA and may include a revised CBA to reflect feedback, or amendments to the policy made following consultation.

How we analyse and estimate costs and benefits

This Statement of Policy sets out how we assess costs and benefits. A key step in analysing the costs and benefits of a policy is to identify and evidence the causal chains through which a policy affects changes in the behaviour of affected FMIs and market participants in ways that impact on markets and, in turn economic outcomes. These causal chains help the Bank identify the benefits and costs of regulation that can arise through multiple channels. CBAs highlight where these channels are relevant.

The Financial Services and Markets Act 2000 (FSMA) (as amended by the Financial Services and Markets Act 2023) requires costs and benefits to be estimated where reasonably possible, and the SoP outlines a range of tools and techniques the Bank will use to conduct quantitative assessments. Direct costs to FMIs are the most straightforward to estimate, whereas it is harder to estimate indirect impacts on FMIs and affected market participants.

Cost Benefit Analysis Panel (CBA Panel)

The Bank is required under FSMA to consult the CBA Panel on the preparation of relevant CBAs ahead of public consultation. The Panel also reviews how the Bank is performing more generally in carrying out its duties with regards to CBA and may provide recommendations.

The CBA Panel plays an important role as a critical friend in supporting increased transparency and scrutiny of the Bank’s policymaking by providing regular, independent input into the Bank’s CBAs. The CBA Panel brings considerable experience and knowledge of CBA and the financial services sector.

1: Introduction

Overview

Part 18 of FSMA gives the Bank of England several rule-making powers in respect of recognised central counterparties (CCPs), recognised centralised securities depositories (CSDs), third-country central counterparties, third-country CSDs,[2] Critical Third Parties (CTPs),[3] and recognised clearing houses which are not recognised CCPs (RCHs).[4] FSMA also requires the Bank to undertake cost benefit analysis (CBA) when using these rule-making powers in a way that advances our Financial Stability Objective (See Section 2 for an overview of the Bank's statutory objectives). The Bank must also publish a Statement of Policy (SoP) in relation to the preparation of CBAs. These requirements enhance the transparency of our policymaking, our accountability and help us make better policies.

This SoP focuses primarily on the approach to CBAs when using the rule making powers available under FSMA as FMI Regulator,[5] particularly for CCPs and CSDs. While this approach also applies to rule making in respect of CTPs, and the benefits and costs for such rulemaking will therefore be measured in broadly the same way as for rulemaking for CCPs and CSDs, references to FMIs or firms throughout this document should be taken to mean CCPs and CSDs. The Bank will not carry out a CBA for individual supervisory decisions.

The FSMA requirements to undertake CBA and to publish a SoP in relation to the preparation of CBAs does not apply to other Bank powers, such as the Bank's power in relation to Payment Systems and service providers under Part 5 of the Banking Act 2009, including the power to publish binding codes of practice. However, where appropriate we will draw on the approach described in this document for any other CBAs that we conduct, such as for code of practice.

This SoP explains how the Bank does CBA for FMIs, how we use CBA in our policy-making process,[6] and how we communicate CBA. As required by FSMA, this SoP also covers:[7]

1. our criteria for determining when we will not estimate (ie quantify) costs and benefits because either they cannot reasonably be estimated or it is not reasonably practicable;
2. our criteria for determining when we will not do a CBA either because we judge there to be no or minimal increase in costs, or because the delay associated with CBA would prejudice our primary objectives of financial stability;
3. our arrangements for considering feedback on the CBA published in Bank Consultation Papers (CPs); and
4. our arrangements for considering feedback from the CBA Panel in relation to how we are performing generally in meeting our statutory CBA obligations.[8]

This SoP is relevant to all stakeholders with an interest in how the Bank makes policy, including FMIs.

In common with the PRA, the Bank's CBA approach has been informed by careful consideration of the CBA frameworks applied by financial regulators and governments in the United Kingdom (UK) and internationally. We have also been informed by consideration of how other organisations apply CBA in practice.

Introduction to CCPs, CSDs and the role of regulation

CCPs interpose themselves between buyers and sellers in financial market transactions and CSDs ensure the transfer of securities and payments after trading. CCPs and CSDs are crucial components of the UK's financial system and so play a significant role in supporting the broader economy. They support the safe operation of financial markets and financial stability by reducing counterparty credit and settlement risk respectively between their participants. In the UK, CCPs clear trillions of pounds worth of notional outstanding of financial contracts per day, and the CSD settles around £800 billion of securities transactions per day.[9] Safe and resilient FMIs ensure financial institutions are able to support businesses and households to manage risk and raise finance.

CCPs and CSDs are the networks that allow financial transactions to take place and are commonly referred to as the plumbing of the financial system, managing and reducing risk in the financial system in order to support economic activity. Their functions are particularly important in times of crisis, as risk could spread rapidly across the system and so further amplify the impact of stress as was seen in the global financial crisis. FMI regulation ensures the financial and operational resilience of CCPs and CSDs so that they can perform their functions of managing risk in the financial sector in all states of the world.

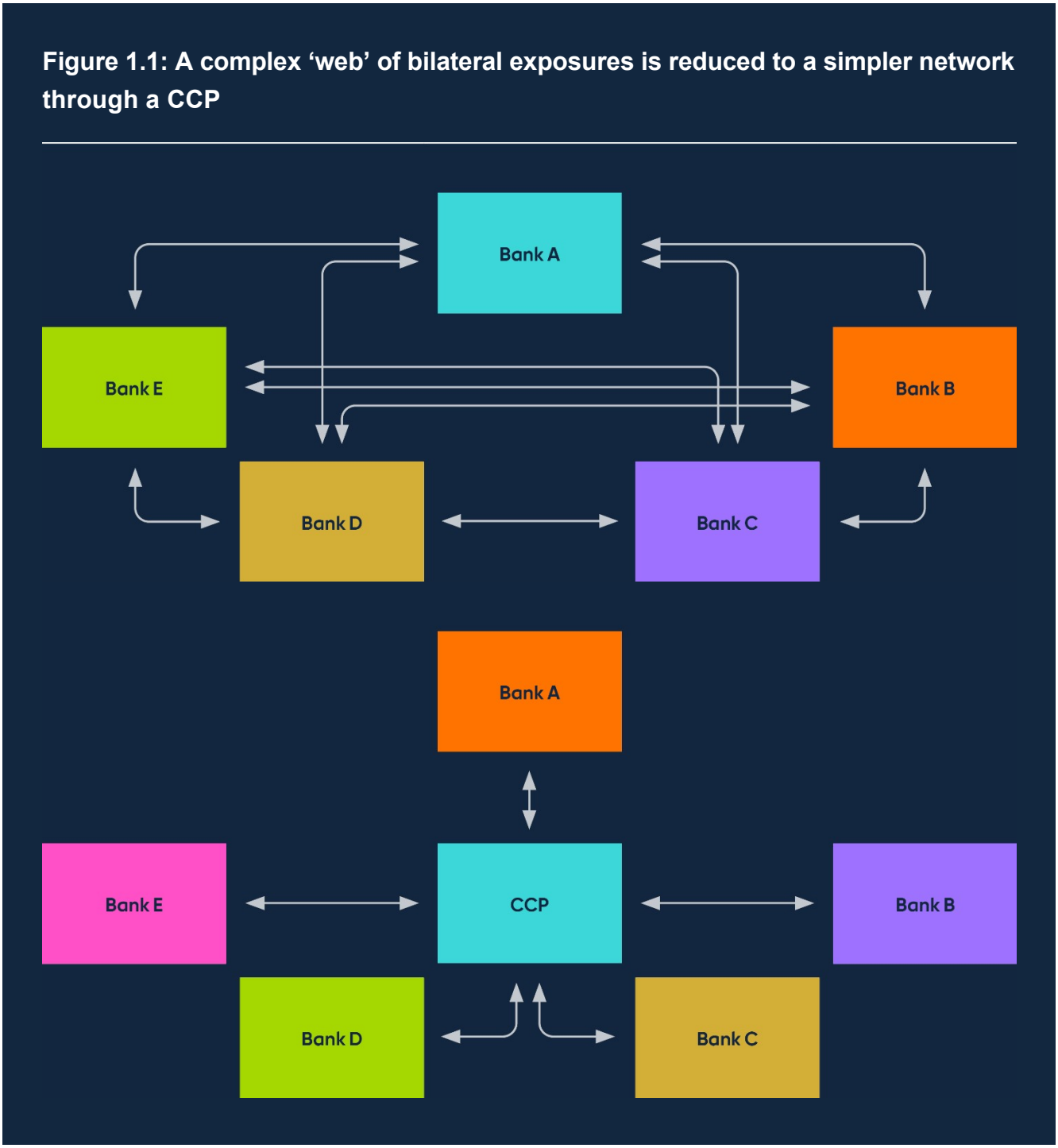
CCPs originally emerged in commodities markets and have managed risks for many decades.[10] When trades are centrally cleared, the original contracts held between institutions, are replaced with a pair of equal and opposite contracts with a CCP (see figure 1.1). Through this process, the CCP becomes the buyer to the original seller, and the seller to the original buyer. If a member defaults, the surviving members are exposed to the CCP, rather than directly to the defaulter.

In times of stress, CCPs act as a dampener of shocks, mitigating contagion in financial markets. If a participant of a CCP defaults, a CCP will manage the process in an orderly, predictable way, ensuring confidence in the financial system.[11] This is achieved through CCPs' default management processes (for example, transferring the defaulter's positions to another member or auctioning them off) and financial resources (for example, the collateral, or margin that the defaulting financial institution has posted to cover losses, and other financial resources as part of

the ‘default waterfall’). Annex 2 provides more information on how CCPs and CSDs work, including more detail on margin and the default waterfall.

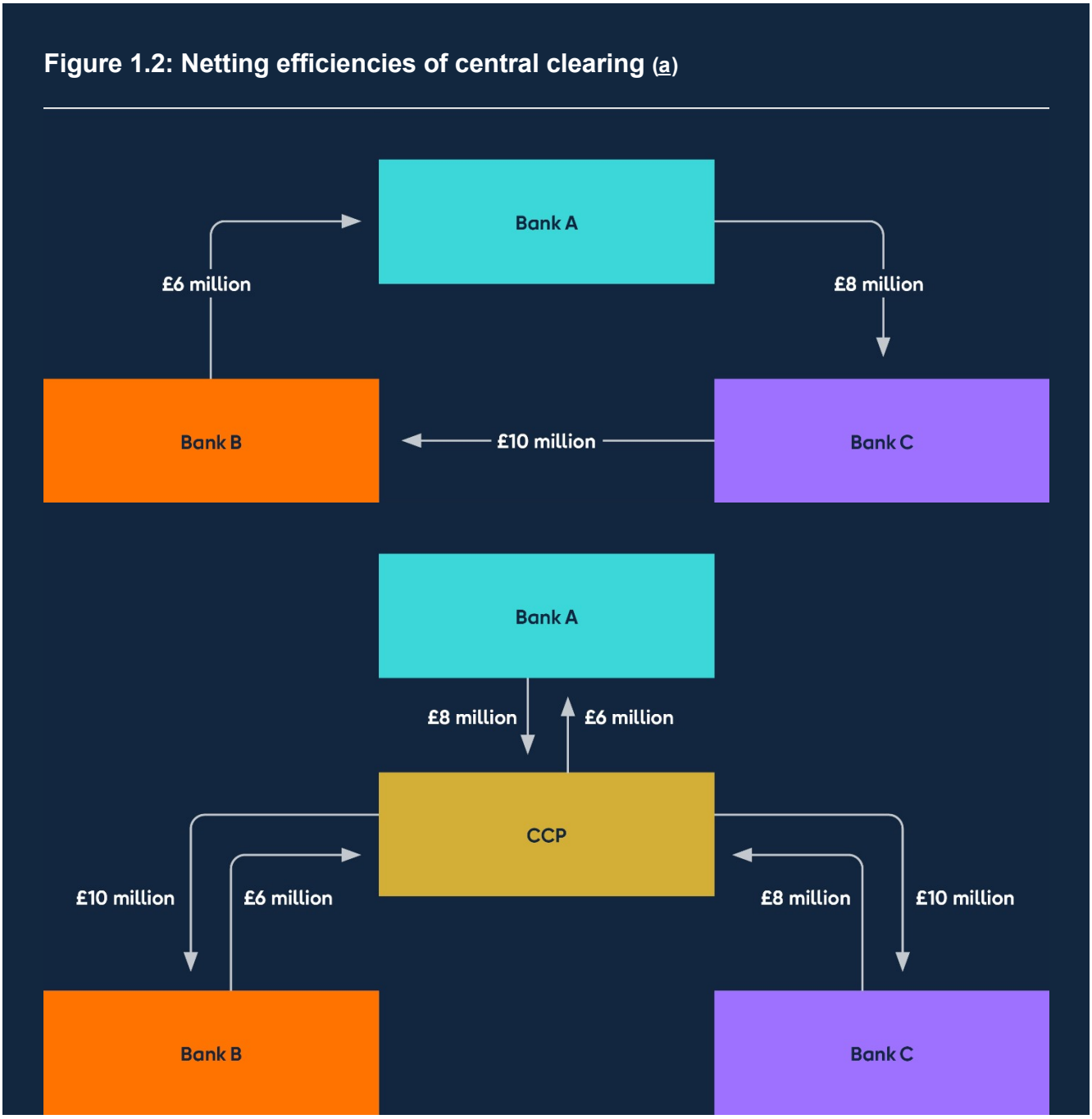
The Global Financial Crisis of 2007–9 demonstrated starkly the financial stability benefits of central clearing, for derivatives markets in particular. A lack of certainty and transparency over large, uncleared derivatives positions held between individual financial institutions exacerbated other problems, such as the significant reduction in market liquidity.[12] When the US investment bank Lehman Brothers failed in September 2008, it had a portfolio of cleared and uncleared derivatives totalling $35 trillion in notional outstanding. Following its collapse, it took many years to deal with uncleared derivatives in the subsequent insolvency procedures (and indeed four years before the first payments were made to affected counterparties). Conversely, its derivatives positions that had been centrally cleared were managed in just a few weeks, using only some of the collateral it had deposited at the CCPs it used.[13] The lessons learned from the financial crisis led to a global agreement that standardised over-the-counter (OTC) derivative contracts should be cleared by CCPs in order to manage better their risks. Mandatory central clearing and other post-crisis reforms to derivative markets have promoted central clearing as a central part of mitigating systemic risk and making derivatives markets simpler and safer.[14]

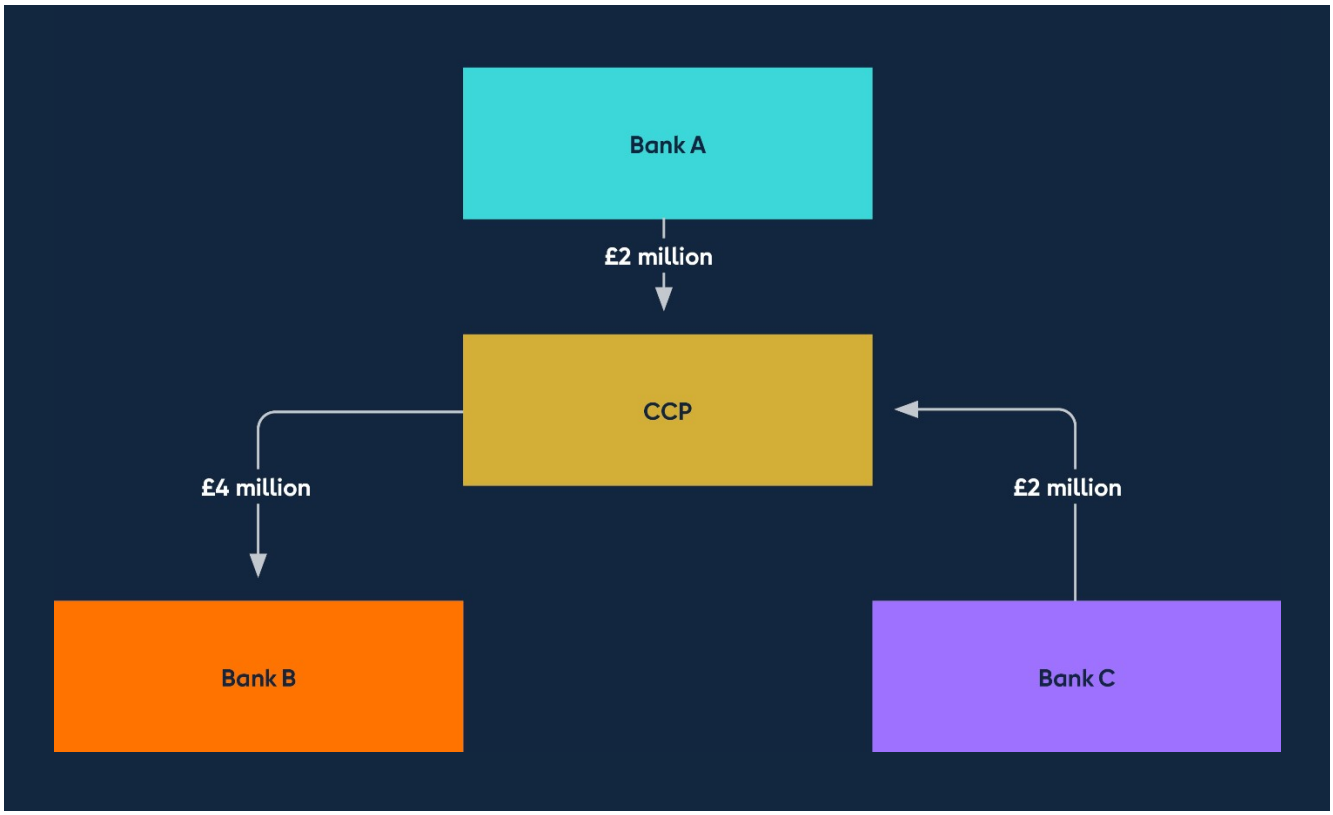
Figure 1.1: A complex 'web' of bilateral exposures is reduced to a simpler network through a CCP



CCPs also reduce risk in normal times (for example, outside the default of a participant) through the process of 'multilateral netting' of collateral for financial contracts. As institutions will clear multiple contracts with multiple counterparties at a CCP, with the CCP sitting in the middle, they only need to hold collateral against the net of their exposures to their counterparties, rather than the gross exposure if they were to deal with each counterparty separately (see Figure 1.2). As well as reducing overall risk in the system, this process of reducing overall exposures supports more efficient use of CCPs' members' financial resources.

Figure 1.2: Netting efficiencies of central clearing (a)





(a) Bank of England Quarterly Bulletin 2013 Q2.

CSDs provide legal certainty to market participants by keeping accurate records of ownership of securities. CSDs that operate securities settlement systems also manage settlement risk by ensuring that a securities transaction only takes place when both parties have met their obligations. Following the agreement of a trade, an example of which could be the sale of a government bond from one counterparty to another, CSDs facilitate the transfer of the security. CSDs give buyers and sellers of financial instruments certainty that a transaction will only take place if securities are delivered at the same time that payment is received – known as 'delivery vs payment' or 'DvP'. This reduces settlement risk in the financial system. They also keep safe and accurate records of securities and update these records following each transaction. In times of stress and in normal times, this gives market participants confidence in investment in securities and other financial instruments, knowing that the transaction will take place and that their ownership will be accurately recorded.

Because CCPs and CSDs centralise risk, their resilience is critical to the safe, stable, and correct functioning of financial markets. Significant disruption or operational outages at an FMI would be a major cause of financial instability, given their centrality to the financial system. CCPs and CSDs are limited in number with few alternative providers or substitutability. This means that the economic costs of outages would be very high. They therefore operate in a highly regulated environment to ensure their resilience. The basis for this regulation is the Principles for Financial Market Infrastructures (PFMIs), which are international standards agreed in 2012.[15]

FMI regulation aims to make FMIs extremely resilient, predictable, and able to recover effectively from incidents should they occur. It ensures the financial and operational resilience of FMIs so that they can achieve their role of reducing risks to financial stability rather than transmitting or amplifying it, especially in times of stress. The financial resilience of FMIs is achieved by holding sufficient financial resources to perform their risk management functions and meet losses, giving confidence to their members. Operational resilience aims to minimise the likelihood of disruption of occurring and enabling FMIs to recover from it when it happens. FMI regulation ensures potentially misaligned incentives, negative externalities or other market failures that can arise between FMIs, their participants and broader society do not lead to poor risk management at FMIs, and ultimately financial instability. The regulation of FMIs therefore plays a vital role in maintaining the stability of the UK's financial sector. This sector has been designated as a Critical National Infrastructure Sector due to it being essential to the functioning of the economy and broader society, in common with other infrastructures such as telecommunications and energy.[16]

The costs of FMI regulation must therefore be weighed against the important benefits to the financial system, and the economy more broadly, of ensuring that FMIs fulfil their role as risk dampeners rather than risk amplifiers and protect the UK financial system and broader society from the consequences of financial instability. We undertake CBAs to ensure that we balance the costs and benefits of regulation in a rigorous and transparent way.[17]

2: Why we do cost benefit analysis and the costs and benefits we assess

Summary

Table 2.A: Summary of Section 2

Key topics	Summary of key topics
Why do we do CBA?	CBA helps the Bank make better policies by enhancing transparency and supporting the scrutiny of our policymaking. CBA facilitates informed and evidence-based engagement with our stakeholders about the proportionality of our proposals.
What benefits do we assess?	The benefits of the Bank's policies arise at the level of FMIs (including the users of their services), broader markets, and the wider UK economy. The most significant benefit we assess is the positive impact[18] policies have on promoting our primary objective to protect and enhance the stability of the UK financial system. Our policies do this through reducing the likelihood and impact of disruptions to the supply of essential financial services, and the likelihood and severity of financial crises. At the firm level, our policies support financial and operational resilience of FMIs, given their criticality to the financial system. At the markets level, our policies foster greater confidence, which benefits market participants both directly and indirectly. Annex 1 explains how our policies bring these benefits by addressing market failures.
What costs do we assess?	We assess three types of costs: • Direct costs to FMIs and to the Bank • Indirect costs to FMIs and market participants that may arise from the way regulation affects FMIs' behaviour. • Costs to the output of the UK economy

Why we do cost benefit analysis

As FMI regulator, we act to advance our statutory objectives, including by making rules. The economic case for FMI Regulation in Annex 1 depends on the benefits of our policy intervention exceeding the costs. This does not necessarily require that all affected parties are better off as a result of the policy change, but rather that the gains in aggregate (in large part through protecting and enhancing financial stability) outweigh the costs imposed. We examine this through CBA,

where we aim to identify the most material costs arising from our policy proposals and compare these with the most material benefits, such as the reduction in the frequency and severity of financial crises. Sometimes we quantify costs and benefits. In other cases (for reasons set out in Section 3 below) we provide only a qualitative assessment of costs and benefits.

CBA fulfils three important functions in our policy making:

1. CBAs represent our best judgement, drawing on the available evidence, of the net impact that we expect our policies to have. Our aim is for policies to deliver a net benefit to society.
2. As part of policy development, consideration of economic costs and benefits shapes the design and calibration of the policies we make, for example by highlighting some of the possible unintended consequences.
3. CBA enhances transparency and scrutiny of our policymaking by providing a structured way for us to communicate the type and scale of the costs and the benefits that our policies are expected to generate. This facilitates an informed and evidence-based conversation with our stakeholders about how our policies effectively and proportionately advance the Bank's objectives.[19]

The Bank undertakes CBA in a proportionate manner. We calibrate the depth of our analysis in proportion to (i) the significance of the issues our rules aim to address, (ii) the potential impact of those rules, and (iii) the costs of asking firms for data (see Section 3 for more information on how we judge proportionality).

There are some cases where the Bank may not carry out a CBA when using its rulemaking power. This includes where a policy change is considered to have no increase in costs or, where if there will be an increase in cost, that increase will be of minimal significance. FSMA also provides an exemption from our requirement to undertake a CBA (or consult on the policy change) where the associated delay would be prejudicial to our financial stability objective. See Section 3 for more detail on these exemptions, including the criteria the Bank will use to determine whether these exemptions are relevant.

The Bank's statutory objectives as FMI regulator

The Bank has a primary objective to protect and enhance the stability of the UK financial system (The Financial Stability Objective).

The Bank also has a secondary objective.[20] In exercising its FMI functions in a way that advances the Financial Stability Objective the Bank must, so far as reasonably possible, act in a way which, as a secondary objective, facilitates innovation in the provision of FMI services (including in the infrastructure used for that purpose) with a view to improving the quality, efficiency and economy of the services (The Secondary Innovation Objective). In advancing its objectives, the Bank must also have regard to a number of regulatory principles.[21]

The benefits we assess

When analysing the potential benefits of proposed policies, we consider the following types of benefits in our CBAs:

1. Benefits to financial stability, particularly in times of stress.
2. Benefits to FMIs and market participants.

Benefits to financial stability

In line with our primary objective, the main benefit from FMI regulation is helping to ensure FMIs are financially and operationally resilient, in order to fulfil their critical role in the financial system and broader economy while preventing risks to financial stability and contagion in periods of market stress. Well-regulated FMIs can, through their design, rules, procedures and operation, reduce risk in financial markets. This contributes towards financial stability. Financial stability allows the economy to perform its key functions, even in times of stress. Financial stability in turn supports confidence in the financial system, and reduces the likelihood, severity, duration and ultimately cost of crises, which would otherwise negatively impact the UK economy.

FMI regulation aims to make the UK financial system more stable than it would otherwise be, over the medium to long term, absent adequate financial regulation.[22] To ensure financial stability, FMI regulation aims to better align the incentives of management of CCPs and CSDs with financial stability, since externalities can exist that can misalign private interests and financial stability (see more detail on these market failures in Annex 1). FMI regulation primarily does this through requirements on financial and operational resilience, as well as governance of FMIs.

Requirements on financial resilience support financial stability through requiring that FMIs manage financial risk and setting standards for how they should do it. For CCPs, this is primarily through requiring them to collect margin and default fund contributions from their members. In normal times, this supports participants' confidence in the use of CCPs and the function they provide in enabling the management of financial risk. At times of market volatility, it ensures that a CCP can absorb and allocate losses, and act as a dampener rather than an amplifier of stress. This protects both the CCP and its participants, as well as the broader financial system. CSDs are also required to hold capital against the risks that they face, such as operational and custody risks, and to ensure that this is sufficient to ensure that they can recover or wind down in an orderly way.

Requirements on operational risk and resilience support financial stability through requiring FMIs to minimise the likelihood of disruption to the critical functions that they provide and enabling them to recover from it when it happens. As with requirements on financial resilience, this supports participants' confidence in the use of FMIs and the functions they provide. These should also reduce instances of operational outages and ensure that FMIs recover more quickly when

outages occur. This reduces the likelihood of the outage having an impact on the FMI's participants through the unavailability of clearing or settlement services, or on the broader financial system.

Finally, requirements on governance support financial stability through requiring effective governance of an FMI, including in it having proper regard both to regulatory compliance and to the management of risk to itself, its participants, and the broader financial system. This is critical to FMIs' proper implementation of the requirements on financial and operational resilience set out above.

Benefits to FMIs and market participants

Through designing policy to enhance financial stability, particularly at times of stress, there can also be benefits to FMIs and the market participants they serve in normal times. High regulatory standards may make an FMI more attractive to participants, as they will better ensure that an FMI is reliable in providing its services.

While, in general, regulation that seeks to enhance the financial and operational resilience of FMIs is likely to involve implementation costs, policy proposals may sometimes reduce direct costs to FMIs, which can be passed on to their members and broader society. For example, simpler regulation may be less costly and easier to comply with for FMIs. Part of this saving may be passed onto users of FMI services or be invested in the resilience of the FMI.

The Bank will generally need to take action to implement, monitor, supervise and enforce the proposed rules. Simplifying regulation could also make it easier to implement, monitor, supervise and enforce, reducing the time and/or resources needed to achieve its objectives.

The costs we assess

Our policies set requirements and expectations on the firms that we regulate, in order to advance the Bank's statutory objectives. Firms must comply with our regulatory requirements, and they may incur costs from doing so, which in turn may have implications for the financial system they operate in, and the broader economy. [23] To propose a policy change, the Bank judges that the policy change (versus the counterfactual of no regulatory change) will have a positive effect on financial stability, and so it would judge that any negative second order effects would be outweighed by the primary benefit of enhancing financial stability.

When analysing the potential costs of our proposed policies we consider three types of cost in the CBA for each policy:

- Direct costs to FMIs and to the Bank.
- Indirect costs to FMIs and market participants.
- Costs to economic output, if FMI regulation affects the supply of financial services, this could

influence both short-run and long-run economic output.

Direct costs to FMIs and to the Bank

Direct costs are costs that are directly attributable to proposed regulatory requirements. Regulation can change the financial resources (for example, prudential requirements) and non-financial resources (for example, staff and technology) needed to support the provision of financial services. In analysing and estimating costs, we focus on incremental costs, comparing against the costs firms would incur absent the regulatory change. The scale of the direct costs to firms will influence whether and how firms might adjust their business models or practices in response to the proposed regulation, feeding through to indirect and macroeconomic costs.

We consider both one-off 'implementation' costs and any ongoing costs incurred to maintain compliance in future years. Costs include financial costs (for example, the opportunity cost of holding an asset in order to meet capital and liquidity requirements) and operational costs (for example, the opportunity cost of staff time and technology used to meet regulatory requirements). Table 2.B provides some examples of the types of direct costs we consider in our CBAs.

Table 2.B: Examples of direct costs the Bank considers in CBAs

One-off direct costs	On-going direct costs
Resource and system/process costs, for example: • engaging with the CP; • understanding the requirements; • conducting gap analysis; • designing the firm's response to the change, including business process change and IT, and governance required to approve the changes; and • staff training, communication with staff, the regulator on implementation progress, project governance.	Resource and system/process costs, for example: • analysis and monitoring to ensure firm remains compliant; • reporting to the regulator; • senior management oversight and review; • staff training and communication with staff; and • costs of additional financial resources, such as higher capital requirements.

The Bank will generally need to take action to implement, monitor, supervise and enforce the proposed rules. These actions will incur direct costs, for example, incremental staff costs and investments in IT system development. In our CBAs we therefore also analyse and estimate any one-off and ongoing direct costs to the Bank. These costs may be relatively small but can be important for ensuring that the benefits of a policy change are realised. If the direct costs to the

Bank of England are passed on to FMIs through changes to the fees charged to those FMIs, we will only consider the increase in cost to FMIs, to ensure that relevant costs are not 'double counted'.

Indirect costs to FMIs and market participants

A certain degree of behavioural response is often the intention of proposed policy proposals, for example through improving risk management. In some cases, a financial activity, while profitable to those who conduct it, may pose risks to financial stability and restricting or eliminating its supply would be considered a benefit rather than a cost. This is particularly relevant to FMIs that hold a significant share of the market of the services they provide due to the benefits of economies of scale, network effects and other factors. However, in many cases behavioural responses may create costs for market participants.

Increased cost of CCP services could result in a change to clearing members' incentives to use these services, depending on whether a given OTC derivative product is subject to the clearing mandate or not. For products subject to the clearing mandate, increased costs could lead to members moving away from clearing those products altogether, leading to reduced capacity for hedging of risks and lower liquidity of those markets. For products not subject to the clearing mandate (where a choice of cleared and non-cleared markets exists), regulatory change could lead to the cost of clearing a transaction becoming higher than the cost of not clearing a transaction, with knock on impacts to the incentives to clear such products. In such a situation, market participants may voluntarily choose to clear less of their activity (versus the counterfactual of no regulatory change). This may lead to some of the financial stability benefits of clearing (outlined above, for example multilateral netting, and mutualisation of risk) being lost.

For CSDs, increased costs being passed on to members could result in settlement taking place outside of regulated CSDs. Given CSDs' role in reducing settlement risk, this could increase the level of settlement failure, which for bonds or equities would mean that less money was being channelled into the real economy.

Changing costs for FMI services could also affect competition for FMI services, with service users possibly incentivised to use FMI services that offer the lowest cost. As set out in Annex 1, for CCPs this competition will often play out internationally.

Where a CCP or CSD loses business due to increased costs this could reduce its ability to function, or manage risk, adequately. CCPs often hold a significant share of the market they operate in, which can generate some positive effects on financial stability because they benefit from network effects (as set out in Annex 1), including greater netting benefits and pools of liquidity, which reduce counterparty credit risk. Negative market impacts could emerge from increased costs reducing the efficiency gains from the clearing or settling of large volumes of similar products. FMI regulation aimed at increasing financial stability may involve trade-offs, such

as increases in collateral requirements aimed at managing counterparty credit risk leading to increased liquidity risk through higher liquidity demands for firms. It may also impact FMIs' or market participants ability to innovate, which is explored in more detail in Box A.

Costs to economic output

Policy requirements can, in some cases, result in costs to economic output. For example, if FMIs or their participants are incentivised or forced to scale down or cease certain activities due to costs imposed through regulation, that could mean a loss of overall revenue and employees working in a particular area; and lower access to finance and financial services for the wider financial sector and the economy. A secondary effect may also be that more costly, or less accessible, CCP services may lead to a more limited ability for businesses to manage financial risk through hedging and so decrease future investment, due to reduced certainty around future cash flows.

Box A: Costs and benefits related to innovation

The Bank has a secondary objective to facilitate innovation in the provision of FMI services when exercising its FMI functions, which include making rules for CCPs and CSDs. When developing relevant policy, the Bank will establish how the policy meets its statutory obligations, including in relation to the secondary innovation objective, and principles to which the Bank must have regard to.[24] Separately, the Bank will consider costs and benefits related to innovation when carrying out cost benefit analysis throughout the policymaking process.

Examples of how FMI regulation can facilitate benefits to innovation may be through regulation that enables FMIs to use new technologies or ways of delivering their services, which further enhance the efficiency, economy and quality of these services while maintaining financial stability. In addition, where regulation reduces direct costs to FMIs (for example, through permitting an FMI to meet a requirement in a way that requires less financial resource), this may be invested in innovation to support new and existing services. Finally, a regulatory framework that facilitates innovation may attract new entrants to provide FMI services, increasing competition in that market, and introducing the possibility of alternative service providers.

However, as well as facilitating innovation, regulation may negatively impact FMI or market participant ability to innovate. This may be where the level of prescription required to achieve financial stability means that it is harder to innovate in a given area. Regulation may also impose direct costs on FMIs, and these could impact their ability to invest in new

technologies or services, which may have a negative impact on innovation.

3: How we do cost benefit analysis as part of policymaking

Summary

Table 3.A: Summary of Section 3

Key topics	Summary of key topics
How we do CBA	Our CBA comprises three main elements: • developing the case for action, which includes defining the problem and identifying potential benefits of change; • assessing Costs and Benefits; and • drawing conclusions, which includes considering key uncertainties and forming an overall judgement on the net impact of a policy.
Our approach to proportionality	The resources – both from the Bank and firms – we spend on CBA will be proportionate to the significance of the policy issues and the impact of the proposal. We consider a range of factors in determining whether we will produce quantitative estimates of a policy's costs and benefits, including the availability of data, the costs to firms and the Bank in collecting data and the availability of credible techniques and models. In some circumstances we will not produce a CBA, where costs are expected to be minimal or where consultation would be prejudicial to the Bank's primary objective.
How we communicate CBA	We include CBA in Bank's consultation papers. Policy statements will include feedback received on the CBA and may include a revised CBA to reflect feedback, or amendments to the policy made following consultation.

How we do CBA

We prepare CBA in an iterative manner as part of our policymaking process. We consider evidence and undertake partial analysis of costs and benefits during different stages of policymaking. The evidence and analysis that we use in our final CBAs evolves primarily during the 'initiation' and 'development' phases of policymaking:

- The **Initiation** phase is the first step in our policy-making approach. We identify potential reasons to act, consider possible responses, and conduct an initial assessment of the case

for intervention. Sometimes we set out this analysis, and seek further evidence, through a discussion paper.

- The **Development** phase starts once we determine that we might need to act, and that a policy response could be appropriate. We develop a policy proposal by analysing the options for new policy, and assessing their relative pros and cons.

We regularly analyse the merits and drawbacks of different policy approaches throughout the initiation and development phases. Ultimately, we produce a refined policy proposal, which delivers what we judge to be the best mechanism for addressing the issue identified, while pursuing our objectives.

We prepare a full CBA on our single refined policy proposal, drawing together the evidence gathered, and the analysis undertaken throughout the policymaking process. The level of detail at which we undertake our CBAs varies by policy proposal, in order to ensure proportionality. Our proposals often take the form of a number of individual component requirements that we consider will, in aggregate, achieve the intended policy outcome (for example, policy proposals may take the form of a number of new or amended rules, and may be accompanied by new or amended guidance).

Our CBAs are intended to support our judgement on the aggregate economic costs and benefits of our policies. In some cases, we can reach that judgement by analysing the costs and benefits of the component requirements on an individual basis. In other cases, where a CP includes a number of significant proposals whose costs and benefits overlap, we may conduct a single, aggregate-level, CBA with or without identifying the standalone impact of component proposals.

As part of policy development, including the development of the CBA, we will seek input and approval from the Bank's internal decision-making bodies as appropriate. These include the Financial Market Infrastructure Committee (FMIC) as well as advice and scrutiny from the independent CBA Panel (see Section 5).

Where a policy proposal amends existing rules, the CBA will measure the incremental costs and benefits associated with such a change against the counterfactual of the existing rule remaining in place without amendment. This is because this provides a more accurate measure than exploring the full costs and benefits of the proposed rule against the counterfactual of no rule at all, as this is not the starting point for the expected costs or benefits.

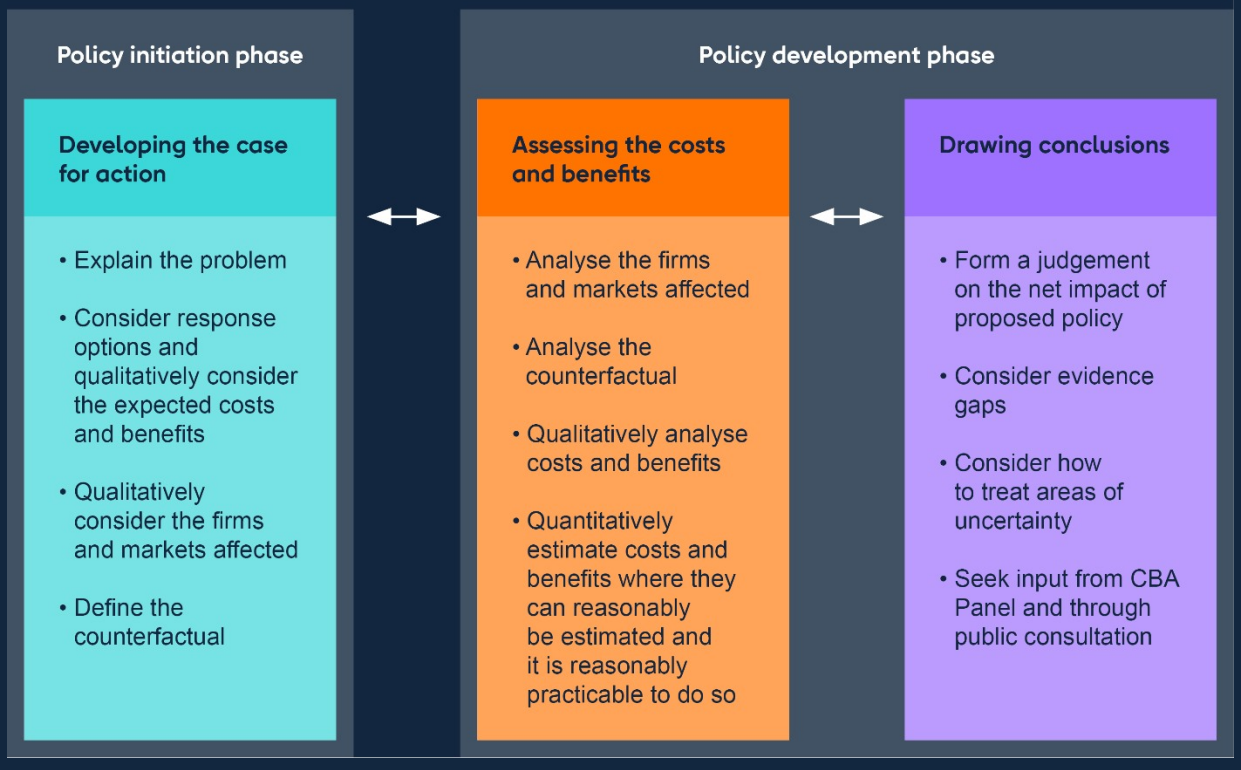
Our approach to preparing CBA is iterative and evolves as part of our policy making process. While our CBAs are tailored to individual circumstances, they are standardised to a degree and generally include the following core components, which are also shown in Figure 3.1:

- An analysis and explanation of the strategic case for policy intervention (developing the case for action).

- An analysis of the costs and benefits that we expect will arise if the proposed policy were to be taken forward. As part of this analysis, we provide an estimate of (meaning we will seek to quantify) the costs and benefits where they can reasonably be estimated, and it is reasonably practicable to do so.[25]
- An overlay of judgement to draw conclusions from our analysis and to form an overall view of the expected net impact of our proposal, subject to uncertainty in our analysis and gaps in the available evidence base.

To benchmark our approach, we have been informed by consideration of a number of CBA frameworks applied by public organisations domestically and internationally.[26] We have also been informed by consideration of the application of our framework in practice against recent examples of CBAs on financial regulation conducted by government departments and prudential regulators in the UK and abroad.

Figure 3.1: Core components of our CBA methodology



Developing the case for action

The first step in our CBA methodology is analysing and explaining the strategic case for policy intervention, also referred to as the ‘case for action’, including articulating the problems which

motivate the proposed change. This might be identified failings in the operation of the relevant markets (so called ‘market failures’, discussed further in Annex 1) and/or existing policies that are operating sub-optimally, for example due to unintended consequences.

As part of analysing the case for action we aim to (i) explain the problem and assess the potential benefits of rulemaking in addressing the problem (ii) qualitatively consider the relative merits of our different response options, (iii) qualitatively consider the firms and markets impacted, and (iv) define the counterfactual (or a ‘do nothing’ scenario).

The CBA frameworks we reviewed generally require that the problem which regulation aims to solve be set out in a CBA and that alternatives to the proposed regulation be considered. However, the extent to which regulators, in the UK and internationally, consider different potential policy options, and the manner in which they do so, varies. Different approaches are taken to the number of policy options considered and the depth of analysis conducted on each option. The Bank is required to conduct a CBA only on its proposed policy intervention, which reflects the regulatory principles to which it must have regard, specifically in respect of the efficient and economic use of our resources. We therefore consider different policy options as part of policy development, as explained below, but generally only conduct and publish a CBA on our preferred approach.

Where relevant, we articulate problems we have identified from an economic lens. For example, the ‘dash for cash’ in March 2020 led to heightened liquidity demands putting firms under pressure to meet unusually high initial margin calls by CCPs which they had not anticipated. One conclusion of this was a need for greater and more consistent transparency of CCP margin models. This demonstrated a market failure, as market participants did not have ready access to all the information that could have enabled them to estimate better what their initial margin calls would be in the event of large market movements.

Consider response options and qualitatively consider the expected costs and benefits

The existence of an economic problem on its own does not provide a case for action. Early on in policy initiation we consider different options for responding to an identified problem. We consider whether any response is required and, if so, whether an industry-led, supervisory-led, or policy-led response would be most appropriate. Where there are multiple viable options, we consider the likely costs and benefits of each option through the lens of our primary and secondary objectives and regulatory principles requirements. The use of alternatives to policymaking can help us to solve policy problems more quickly and encourage greater compliance. It can also help to minimise burdens on FMIs and the users of their services and facilitate innovative services.

Where we consider a policy-led approach to be the right response, we start policy development

by examining the policy options. We set out one or more initial policy approach(es) and articulate their aims and scope. We consider the channels through which we expect our rules to bring about benefits and costs.

Once we have described our initial policy approach(es), we analyse and refine these. The nature of the respective risk or opportunity will shape this process. Where we need to act urgently to meet our objectives, we might expedite some of these steps.

Qualitatively consider the firms and markets affected

During policy initiation we qualitatively consider which firms and markets will be affected by any proposed policy interventions. When considering impacted firms, we focus on the population of firms to which any requirements will directly apply. Where relevant, we also consider other firms that may be directly impacted (for example, members of CCPs and their clients).

Where relevant, we also identify the particular markets for financial services that are likely to be impacted by our intervention. This will vary considerably depending on the type of policy intervention and the type of FMI.

Define the counterfactual (or a 'do nothing' scenario)

During policy initiation, as a basis for considering the potential costs and benefits of policy interventions, we define a counterfactual against which to compare the expected outcome of potential policy interventions.

FSMA requires us to make a 'comparison between the overall position if the rules are made and the overall position if the rules are not made'.[27] A CBA, therefore, needs to establish a counterfactual 'do nothing' scenario, in which the rules are not made. Generally, this is straightforward. In some cases, however, where legislation or other policies are changing, we need to take a judgement about what will be in place in the counterfactual scenario. In some instances, the expected policy approaches of other jurisdictions can be relevant to the counterfactual; the Bank may take these into account when implementing international agreements.

We consider the consequences of not intervening in terms of the risks posed to our statutory objectives and the costs imposed on society should those risks materialise. This reflects FMIs' position as a vital part of the UK's financial system and its wider economy, through enabling effective management of risk in the system. This means that regulation of FMIs plays a crucial role in safeguarding financial stability by requiring FMIs to act more prudently or transparently than they may otherwise chose to do.

Assessing the costs and benefits

In the policy development phase of the policy cycle, we examine the economic case for policy intervention using CBA. Our analysis of costs and benefits starts with refining our understanding of the firms and markets impacted and the counterfactual. We then use these inputs as part of our qualitative analysis and where practicable, quantitative estimates of the expected costs and benefits of our policies.

Analyse the firms and markets affected

As part of policy development process, we refine our understanding of the population of firms that our policy intervention will impact.

Understanding the affected firm population and markets is critical for analysing and estimating the impacts of the intervention, and in particular the costs. Understanding the impact on the directly affected FMI population tends to be more straightforward. However, there are often impacts on parties not directly affected by the policy change that can be more difficult to understand. Firms indirectly exposed to policy change are highly interconnected through FMIs (for example, CCPs members also serve additional clients, but CCPs may not have oversight of these relationships).

Analyse the counterfactual scenario

We also analyse the counterfactual against which to compare the expected outcome of our policy intervention, and in particular what we expect to happen if the Bank does not change its policies. This requires judgement and can significantly impact the analysis of cost and benefits. The counterfactual may not always represent the status quo. Markets, business practices, and regulations evolve over time, and we aim to take these future developments into account where possible. Such developments could be, for example, the growth of a risky activity that, while small now, is likely to become a material risk to our objectives if left unchecked, or the commencement of any unrelated but relevant regulations that will come in to force over the assessment horizon.[28]

Absent regulatory change, firms still face incentives to mitigate risks – so the costs and benefits we seek to identify are those which are incremental to firm practices absent the proposed change to regulation.

Additional steps involved in assessing costs – qualitative and quantitative analysis – are considered in detail in the next section.

Drawing conclusions

As part of assessing benefits and costs, we reach a judgement, in light of the best available evidence, of whether the policy proposal creates an overall net benefit to society.

We will highlight evidence gaps and how we have taken these into account when forming our

judgement. Highlighting these evidence gaps also maximises the value of the feedback we receive as part of the consultation process.

In forming our judgement on net impact, we have to take into account the fact that there is generally material uncertainty around estimating costs and benefits of FMI regulation. We deal with uncertainty as part of preparing our CBAs in part by:

- Testing that our assumptions are reasonable and by considering the implications of altering important assumptions, especially those where the gaps in the supporting evidence are most significant.
- Where appropriate, conducting sensitivity analysis around the key assumptions in our analysis, including using ranges for our estimates for benefits and costs to account for uncertainty and to avoid presenting an estimation that appears more accurate than it is possible to achieve in practice (ie spurious accuracy or false precision).
- In some cases, using break-even analysis where it is difficult to estimate benefits in a precise or quantitative way. Break-even analysis considers the size of the benefit required for benefits to exceed costs. Such analysis can help stakeholders form a view on how reasonable it is to expect a policy to be net beneficial.

A very important step, particularly where expected impacts are harder to estimate but potentially material is seeking expert independent input from the CBA Panel on individual CBAs. Section 5 explains the role of the CBA Panel, which also includes providing recommendations on the Bank's overall approach to CBA.

Finally, uncertainty in CBA is also addressed through the consultation process itself. We welcome views from respondents on all aspects of our CPs, including on the CBAs contained within them. All responses are considered. We judge the relevance and materiality of responses and whether they merit adjustments to the policy proposal. As part of policy statements containing final rules the Bank summarises consultation responses, including those on CBA, as well as its judgements on them and any adjustments it has made in light of them.

Our proportionate approach to CBA

The Bank of England Act 1998 requires us to have regard to the efficient and economic use of our resources, and this informs our approach to CBAs. There is a cost to undertaking CBA both to the Bank and to the firms we regulate, whom we may rely on to provide certain data and evidence to help us understand the potential economic costs and benefits of our policies. Data from regulated firms is an important input in our CBAs but it is costly for them to provide, so we have to be selective in deciding when to seek input from regulated firms. We calibrate the depth of our analysis so that the expected costs of undertaking CBA are proportionate to (i) the significance of the issues our rules aim to address, and (ii) the potential impact of those rules, and (iii) the costs of asking firms for data. In our calibration we pay particular attention to: the

materiality of the burden the associated policy change is likely to impose on regulated firms and the UK economy; the scope for the CBA to inform policy-making;[29] and the extent to which evidence supporting intervention already exists.

Proportionality also informs our approach to **estimating** costs and benefits. When we do provide estimates, they take the form of approximate calculations or judgements of the size or value of costs and benefits. We provide estimates of economic costs and benefits when those impacts can reasonably be estimated, and where it is reasonably practicable to do so.[30] As explained in Section 2, we may estimate benefits in non-monetary terms, for example, the reduction in time for a new margin model proposed by a CCP to be approved by the Bank. We determine our approach to estimation on a case-by-case basis.

When determining whether an impact can **reasonably be estimated** we have regard to the:

- existence and quality of the data inputs required for estimation[31];
- suitability and robustness of the methodological approaches and models available;
- reliability of counterfactual analysis;
- empirically-validated credibility of expected market participants' responses to our proposed intervention;
- usefulness of any resulting estimate, including the feasibility of representing the estimate as a monetary value for comparison against other costs and benefits; and
- credibility of any resulting estimate, including the need to avoid presenting an estimation that appears more accurate than is possible given the accuracy of the inputs from which it is derived (ie spurious accuracy or false precision).

When determining whether it is **reasonably practicable** to quantitatively estimate costs or benefits, we have regard to proportionality and to the efficient and economic use of our resources:

- **Proportionality:** Proportionality underpins our assessment of when it is reasonable to seek to estimate costs and benefits. We generally consider it proportionate to estimate impacts only where these are likely to be significant or where such estimates will provide useful inputs into the development and calibration of our policies; or where the judgement of the balance between costs and benefits is finely balanced and the quantification of impacts can reasonably expected to help inform that judgment.
- To judge proportionality at an early stage of policy development, we consider the significance of the issue that we are seeking to address and the potential impact of a policy response. We assess, at a high level, the potential benefits to our objectives and the expected scale of compliance costs that may be faced by regulated firms. This initial assessment is generally qualitative in nature but may make use of quantitative techniques such as modelled approximations of expected compliance costs.

- **Economic and efficient use of resources:** Practicability of estimation is primarily driven by the availability of relevant data and the suitability of our existing CBA toolkit as applied to the costs and benefits being analysed. Where relevant data may exist but is unavailable to us, we have to judge whether it is proportionate to seek to collect and analyse it. Assuming relevant data exists, the Bank has to expend resources to collect and analyse it. Generally, such data is held by regulated firms, who must also expend resources to collect the data and provide it to the Bank. In addition to the resource implications of gathering data, we also consider the feasibility and expected costs[32] of expanding our toolkit if and when required and the likely benefits this will bring to estimating impacts.

Our CBAs provide a structured approach to analysing the potential costs and benefits of our policies and assessing the evidence base supporting this analysis. The CBA process is an important and useful one even where costs and benefits are not quantitively estimated. In cases where we do not estimate costs or benefits, we will provide a statement in our consultation paper which explains why, in our opinion, they cannot be reasonably estimated or it has not been reasonably practicable to do so.[33]

The circumstances in which we may not undertake a CBA

We seek to undertake a CBA for the vast majority of our policy decisions in order to support transparency and accountability in our policymaking.

There are a limited number of circumstances where we are using our rulemaking power but are not legally required to undertake a CBA when making rules. These include where a policy change is considered to have no increase in costs or there will be an increase in cost, but that increase will be of minimal significance.[34] When considering the use of this exemption we have regard to the following matters:

- the quality and transparency of the evidence base supporting our view that there will be no or minimal costs; and
- the expected size of the benefits of the associated policy. Where benefits are material, we would still seek to undertake a CBA.

Examples of policy proposals where we may not undertake a CBA include corrections to inadvertent errors in our rules.

FSMA also provides an exemption from our requirement to undertake a CBA of rule changes (or consult on the policy change) where the associated delay would be prejudicial to our financial stability objective.[35] In the limited circumstances where this exemption applies, we will still usually seek to conduct and publish a CBA in a timely manner after the associated policy has been made. When considering the use of this exemption, we have regard to the following matters:

- The scale of any immediate threat to the Bank's objectives and the risks of delaying policy action (for example where we may need to respond to rapid changes in market conditions caused by low-probability high-impact events to protect financial stability or avoid significant adverse effects).
- Our ability to mitigate observed or anticipated risks to our objectives via a means other than creating or amending Bank rules (for example, supervisory led action or firm-specific requirements).
- Any relevant directions or recommendations made to us from UK public authorities, regulators, or international standard setting bodies.
- The evidence available to us that the benefits to our objectives will be proportionate to any costs.

How we communicate CBA

We undertake CBAs in the 'Policy Development' stage of the policy cycle and publish them as part of our public consultation process in our CPs.[36] In most cases the CBA will be set out in the section relevant to the proposals to which it relates. In other cases, we may set out an aggregate-level CBA, which complements analysis in the individual sections.

If the final rules we make differ from those consulted on in a manner that we consider to be significant then, we will publish details of the difference, together with an updated CBA.[37]

4: How we analyse and estimate costs and benefits

Summary

Table 4.A: Summary of Section 4

Key topics	Summary of key topics
Causal chain analysis	We undertake causal chain analysis to identify the expected costs and benefits of our policy interventions and to establish how those impacts will be generated. We consider whether a policy proposal is likely to result in: • costs or benefits as they would apply to individual FMIs, including indirect impacts on FMIs' participants; • market impacts in terms of behavioural changes; and • macroeconomic impacts (for example, economic benefits such as reduction in frequency and severity of financial crises).
Evidence	Where appropriate we present evidence to validate the key assumptions of our causal chain analysis using supervisory intelligence; research and international comparisons; data analysis; and information gathered from firms. Based on this evidence, we draw qualitative conclusions about the scale of costs and benefits. We revisit this analysis in light of new evidence gathered as part of our public consultation process.
Estimation	We provide estimates of economic costs and benefits when those impacts can reasonably be estimated, and where it is reasonably practicable to do so. [38] Our estimates take the form of approximate calculations or judgements of the quantitative value, number, quantity or extent of costs and benefits. If our causal chain analysis suggests that a policy proposal could have a macroeconomic impact, then we estimate this impact in monetary terms. When estimating firm-level or market-level impacts, we may do so in monetary terms (eg estimating costs such as the compliance costs faced by firms) or non-monetary terms (eg estimating benefits to financial markets due to a policy change). Where relevant, we will also consider impact of our polices to FMIs' innovations and technological advancement. Where relevant, we also estimate monetary economic benefits arising where our policies reduce the direct costs to firms of complying with Bank policies.

Causal Chain Analysis

The primary analytical technique we use in our CBAs is causal chain analysis – an explanation of how a policy change will create benefits and costs. All Bank CBAs will include an explanation of the causal chains through which benefits and costs are expected to arise, including the following elements:[39]

- an understanding of how the intervention is expected to work in practice, for example, the problem the intervention aims to address, including whether the measure aims to support the continuity of essential financial services, and the extent to which there are likely to be system-wide benefits;
- the change it aims to bring about;
- the causal chain of events that are expected to bring about the change;
- the main actors affected (for example, firms and their counterparties); and
- the expected conditions required for the intervention to succeed.

The causal chain will generally begin with the **direct** impact of a policy on individual firms and their costs. This means that impacts on FMIs' cost are relatively more straightforward to analyse, compared to other kinds of impacts. The costs that firms incur will impact their behaviour, potentially creating benefits of improved firm-level resilience.

In turn, impacts on firms' costs, behaviour and resilience will create **indirect** impacts at the level of economic markets (for example, the cost to clear a particular transaction) and ultimately, the macro-economy. The indirect impacts of FMI regulation on the macro-economy may include feedback loops where the indirect impacts produce further behavioural change within the market, including potential unintended consequences (for example, a reduction in central clearing), and so are hard to predict, analyse and estimate.

FMI regulation involves managing the risks to highly systemic firms, whereby increasing resilience may have a small but crucial impact on reducing the likelihood, severity, duration, and ultimately cost, of crisis. These impacts can be difficult to quantify, and concrete evidence of the economic impacts of FMI policy changes is limited. Rather, we will often need to consider how a causal chain might operate in the future, under a plausible hypothetical stress or shock, to bring benefits over the medium to long term. This creates a significant role for forward-looking judgement in the Bank's analysis of benefits.

Our analysis of causal chains may rely on economic theory, evidence and experience, which together allow us to draw conclusions about how firms will respond to a change of incentives, and how this will feed through to economic benefits or costs. Our review of the evidence will be proportionate to the impact we expect a policy change to have.

The remainder of this section highlights the main sources of evidence we draw upon in our

analysis and estimation of costs and benefits before turning in more detail to how we analyse and estimate those benefits.

Sources of evidence for CBA

We gather and use evidence as part of policy development. This evidence base informs the final CBA we prepare on our preferred policy proposal. We may also seek to gather additional evidence, beyond that needed directly for policy development, for the purposes of CBA. When responses to our CPs reveal additional information or more relevant data, the Bank will review the CBA to incorporate additional information that has become available and revise CBA if necessary. The primary sources of evidence that we rely on are supervisory intelligence, information and data from regulated FMIs, third party information and data, international benchmarking and case studies, and research.

Supervisory Intelligence

An important source of evidence of benefits is information gathered as part of the supervision of Bank-regulated firms. Our supervisors regularly speak with and assess the practices of regulated firms, and may have evidence, for example, on the extent to which firms' current practices fail to mitigate risks, or on the scale or nature of new risks which product or process innovation is creating. Both could help identify and size the benefits from a policy intervention. Equally, supervisory intelligence is important for understanding the practical implications of the changes firms need to make and so the impact on their costs. Supervisory intelligence can include a broad spectrum of sources including: business-as-usual supervision of firms, thematic or cross-firm reviews, horizon-scanning exercises, and insights from significant events, including near-misses.[40] Given the forward-looking nature of FMI regulation, information drawn from hypothetical scenarios, such as stress-testing or simulated events can be important.

Information and data we gather directly from FMIs

The Bank uses regulatory reporting, surveys and discussion papers to source information and data from FMIs that can help us to assess costs and benefits. It may be difficult for individual firms to take a view on the benefits of change, which depends on industry-wide changes. However, surveys and discussion papers can be a good way to understand current practices and how firms might respond to policy intervention, which can provide insight into both costs and benefits. Using surveys can be challenging in the context of preparing a consultation paper because policy proposals continually evolve, and the proposals at the time of the survey may differ from those on which the Bank will eventually consult. While the Bank does regularly engage with industry on policy issues, we cannot pre-consult particular firms on specific policy proposals, or set expectations that we will implement specific policy proposals, so any information gathered from industry surveys may be necessarily high level. This can require the Bank to make further assumptions when applying survey results to the CBA of the proposal in the CP.

The Bank as FMI regulator has a small sample size of firms from which to draw data from. Where the Bank publishes data gathered directly from regulated firms, we will consider how best to ensure anonymity.

More in-depth information can be sought via subject expert industry groups. In these cases, where possible, the Bank aims to ensure a level-playing field by which all firms have an equal opportunity to participate.

Analysis of regulatory returns and data volunteered by CP respondents can all be important in the analysis of benefits. Such quantitative analysis may stop short of estimating benefits while providing evidence that benefits are likely to arise.

Information volunteered by firms and provided through feedback (for example, to Discussion and Consultation Papers) can also be important sources of information from firms.

International benchmarking and case-studies

Much of FMI policymaking begins at the international level.[41] This often provides a body of evidence from international benchmarking, or other techniques, which is relevant to a Bank CBA.

Where different jurisdictions apply different standards, it may be possible to draw conclusions on the effectiveness of the standards for example, in terms of the frequency at which a particular risk crystalises. Where another jurisdiction has introduced a policy measure or reviewed a policy, it may be possible to make inferences about the effectiveness of that measure by considering it as a case study.

Research

High quality central bank, practitioner, academic or industry research, can also inform our analysis of costs and benefits. Industry research can also provide significant insight, particularly into fast-changing markets.

Evaluation

As part of the policymaking process, the Bank will periodically evaluate the effectiveness of its policies. Reviewing FMI rules is a legislative requirement for the Bank, introduced by the Financial Services and Markets Act 2000.[42] The analysis from policy evaluation and rule reviews can also provide information which could inform future CBAs.

Techniques for assessing impacts

This section outlines the techniques that the Bank may use to identify the likely costs and benefits noted in Section 2. While impacts may be positive (benefits) or negative (costs), the techniques

will be largely the same and so they are taken together in this section.

Techniques for assessing direct impacts to FMIs and the Bank [43]

Direct costs to FMIs

Identifying and estimating direct compliance costs to FMIs is generally more straightforward than the other impacts but is still subject to material uncertainty and we may give a range of estimates. Analysing direct impacts also helps us to understand potential impacts on market participants and broader macro-economic impacts. As such direct impacts will be estimated more frequently than other impacts. The Bank will generally estimate one-off and ongoing compliance costs, as well as the additional costs of any increased financial resources (for example, increased capital or margin requirements).

Our starting point for estimating costs of compliance is usually market prices (for example, IT systems and consultancy fees). We estimate the opportunity costs of staff time using the full time equivalent (FTE) costs – including salary and overhead (for example, pension, national insurance contributions, benefits etc) – of relevant skilled employees and the time required. Where available, we obtain technology and labour market prices by making use of existing industry reports, market and supervisory intelligence, and estimate the time required through comparison with past comparable exercises, discussions with supervisors or industry associations. When necessary, we also conduct surveys among relevant firms to substantiate our modelled operational costs.

We may make use of a Standard Cost Model (SCM) which helps quantify direct costs to firms based on assumptions around average salaries, person hours to implement a policy change, and any technology or other costs on firms.

Direct impacts to the Bank

New policy may increase supervisory costs for the Bank through a broadened remit. The Bank may need to increase resources, and this cost may or may not be passed onto firms through our fees regime.[44] There may also be an opportunity cost of staff time if existing regulatory resources are used.

Techniques for assessing indirect impacts on FMIs and market participants

As well as direct costs from FMI regulation, economic impact operates at the financial system and macro-economic level. This includes impacts related to the risk of financial crises, confidence in the financial system and the risk of operational disruption to essential services, all of which impact financial stability.

Indirect effects of FMI regulation on affected market participants (as well as broader macro-economic impacts), are harder to estimate than direct costs. Inherently, there will be many

assumptions, clearly labelled in our CBA, when we choose to undertake such analysis.

Regulation can increase firms' costs, and this could lead to the negative impacts on market participants described in Section 3, reducing the quantity, quality or variety of products and services available, or increasing their price.

The immediate effects of policies on firms' decisions about pricing and services provided may be exacerbated by the way regulation impacts on innovation, for instance if regulation created too high a barrier to entry to new entrants looking to provide quicker or cheaper services.

Conversely, if regulation reduces firms' costs, this could increase the quantity, quality or variety of products and services available, and reduce their cost. Similarly, the Bank has a secondary objective to facilitate innovation in the provision of FMI services, and so aims to design its regulation to facilitate innovation with a view to increase the quality, efficiency, and economy of FMI services.[45]

The causal chains by which increases to direct costs impact firms' behaviour and so bring about these indirect costs may be brought about are complex, especially where indirect costs arise though effects on innovation. For these reasons, our analysis of such impacts will generally be qualitative, unless a relevant study already exists.

Reducing the risk of operational disruption can also bring benefits in the markets for the critical services provided by FMIs. As with confidence-supporting measures, the key to analysing this benefit is usually to demonstrate that a policy change is likely to improve operational resilience at the level of the firm. Estimates of the costs from disruption which firms might avoid through increased resilience might be used to proxy the economic benefits.

Techniques for assessing wider impacts to financial stability and broader economic output

Where the Bank is making a major policy intervention, this may be expected to have a material and standalone impact on the financial stability. How FMI regulation creates economic benefits to financial stability is discussed in Annex 1. However, our policies can also bring about macroeconomic costs (even if the net benefit remains positive). Our approach to the assessment of macroeconomic impacts recognises that upholding financial stability will require balancing these benefits and costs.

As set out in Annex 1, it is very difficult to precisely quantify the extent to which a particular policy affects the likelihood, severity, duration and cost of crises. There is limited literature on cost of crises originating from FMI failure or disruption; and even fewer examples in literature of FMI failures following the development of the modern FMI regulatory regime after the global financial crisis, importantly including effective resolution regimes for banks and CCPs. The Bank may, therefore, more often than not provide a qualitative assessment of how major policy changes

would impact confidence, or seek to affect the probability, cost or severity of a crisis, versus aiming to precisely quantify such impact. The Bank may also draw from the few historical and international examples of FMI disruption or failure, or of broader crises in the financial system or other critical infrastructure, to help understand how such crises or failures could impact the broader macro-economy.

Confidence effects

The general approach to analysing confidence effects is to analyse whether there is a credible impact of a policy change on firm resilience and broader financial system resilience. If the policy change improves firm resilience, then we are comfortable to conclude that confidence will also be supported. In individual markets, this could increase the attractiveness of the financial system as a whole, through trust in its stability, and so increase use of FMI services. However, there are limits to the level of 'confidence' that firms will consider necessary and beyond which it imposes costs that make use of the service unattractive (leading to them either ceasing the activity or using another provider).

To inform our judgement on the likely size of the confidence effects of our policies we rely on estimating firm-level measures as proxies, case study analysis, or, where it is proportionate to do so, commissioning independent analysis.

Supporting confidence can also reduce the risk of financial crises and facilitate financial stability.

Cost of crisis

A conceptual framework for measuring the financial stability benefits of FMI regulation could, however, be grounded in the extent to which regulation can influence the expected economic cost of a financial crisis due to FMI disruption or failure, which consists of three elements:

- The probability of a financial crisis. This variable can be influenced by, for example, the financial resources, levels of operational resilience, and risk management at FMIs, as well as broader measures such as volatility of broader financial markets.
- The cost (in % of GDP terms) given a financial crisis. This variable is driven by the costs generated as a result of procyclical dynamics that develop during crisis, and the economic costs of the failure of FMIs or disruption to their essential services.
- The value (in £ terms) of economic output exposed to the relevant risks.

This is a conceptual framework, and as noted in Box B there are limitations to the extent that the data is available to come to an accurate prediction of the precise likelihood, cost and value associated. However, it can be a helpful way to work qualitatively through the expected impact of certain policies given identified risks or potential weaknesses at FMIs.

Box B: Factors to consider when analysing and estimating the market or system-wide benefits of FMI regulation

In analysing the causal chains associated with FMI regulation, we need to take account of a range of challenges linked to the channels through which costs and benefits arise. These channels are set out in detail in Annex 1. The most relevant points are that these channels:

- are complex in that they involve multiple mechanisms which may feed into each other and back on themselves (feedback loops) in ways which are not easily observed or predicted;
- involve a wide range of stakeholders which interact with each other, including: CCPs, CSDs and the users of their services; and
- involve addressing the risks of low probability but very high impact hypothetical scenarios which may arise in the future rather than current harms that are visible and measurable today.

5: Cost Benefit Analysis Panel (CBA Panel)

The CBA Panel is a statutory Panel that provides independent advice on CBA to the PRA and also to the Bank in respect of its rulemaking for FMIs and critical third parties.

The role of the CBA Panel

The CBA Panel plays an important role as a critical friend to the Bank in supporting increased transparency and scrutiny of the Bank and PRA's policymaking by providing regular, independent input into CBAs. The Panel's terms of reference and membership can be found on the Bank of England's website.[46] The CBAs of many other public organisations are subject to review by external bodies and the role of the CBA Panel is consistent with international practice.

The Bank is required to consult the CBA Panel on the preparation of CBAs ahead of public consultation, with some exceptions set out below (see Threshold for CBA Panel review below). The Bank generally consults the Panel once the Bank has determined which proposals it will consult on. This maintains the Bank's ability to develop policy in an agile manner and ensures the Panel's time is used efficiently and only on CBAs for viable policy proposals. The Panel does not make recommendations on which policies the Bank should consult on. The default approach to consulting the Panel is to submit to the Panel a near-final CBA for the Panel's review and to meet with the Panel to discuss its feedback and advice. In some cases, where policy proposals are deemed lower impact and the associated CBAs are more straightforward, the Panel may provide its advice in writing. The Bank will make clear in its consultation papers when it has consulted the CBA Panel and, where relevant, may set out the consultation paper the areas where the Panel focused its feedback and advice.

The Panel must also keep under review how the Bank is performing more generally in carrying out its duties with regards to CBA and may provide recommendations for example on how Bank can improve the overall approach to CBAs and its methodology over time.[47] The CBA Panel discharges this duty by inputting into the preparation of the Bank's CBA Approach Statement of Policy and by recommending improvements to this Statement of Policy over time, informed by the lessons learnt from reviewing Bank CBAs (including reviewing samples of past CBAs or by examining the Bank's methodologies).[48] The Panel may provide to the Bank recommendations as a result of its reviews, which the Bank will consider and respond to in its annual report. In addition, the Chair of the CBA Panel also meets regularly with the Bank's executive to support timely and effective engagement with the Panel, and to support the Bank's careful consideration of the Panel's advice.

Composition of CBA Panel

The CBA Panel is established and maintained by the PRA, in consultation with the Bank. The PRA appoints panel members in line with its Statement of Policy on Panel appointments.[49]

The Panel is formed of independent experts from a range of backgrounds as well as a minimum of two practitioners employed by PRA-authorised firms. Collectively, the membership of the CBA Panel brings considerable experience and knowledge of CBA, prudential regulation, and the financial services sector (across banking, insurance, and FMIs).

Public communication

The Panel writes an annual report submitted to HM Treasury and laid before Parliament. This annual report will also be published on the Bank of England's website.

The Bank makes clear in its consultation papers when it has consulted the CBA Panel and, where relevant, may set out in the consultation paper the areas where the Panel focused its feedback and advice. Ahead of public consultation, the Bank incorporates feedback from the CBA Panel and reflect any implications in the accompanying policy proposal. Responsibility for the CBAs on FMI rulemaking remains with the Bank.

The Bank includes in its Annual Report information about its engagement with the CBA Panel as well as the contributions the Panel has made to the Bank's CBA methodology and approach over the reporting period.

Threshold for CBA Panel review

As the requirement on the Bank as FMI regulator to conduct CBA is new and given the relatively limited literature on CBA for FMI regulation and difficulty in precisely estimating the benefits and costs of FMI regulation, it would be difficult at this stage to set an objective quantitative threshold for the CBA Panel to be consulted on CBAs. The Bank will therefore consult the CBA Panel on all CBAs that are required by legislation. As the Bank works with the CBA Panel, it may identify cases where the CBA Panel does not need to be consulted. This will ensure the best use of the CBA Panel's expertise and resources. The Bank would set out any change to this approach in an updated Statement of Policy.

Annex 1: The economics of FMI regulation

The Bank has a primary objective to protect and enhance the stability of the financial system of the United Kingdom. Financial stability allows the economy to perform its basic functions, even in times of stress. The Bank, in its role as the UK's regulator of Central Counterparties (CCPs) and Central Security Depositories (CSDs), also has a secondary innovation objective.[50] Through well designed FMI regulation, the Bank can help to facilitate innovation in FMI services, which creates economic benefit by improving the services offered, for example in their quality, efficiency and economy, which in turn makes market participants more confident in using FMI services.

CCPs and CSDs (collectively FMIs in this document) can, through their design, rules, procedures, and operation, reduce risk in financial markets.[51] This contributes towards financial stability. This is particularly valuable in times of stress by dampening stress, reducing contagion, as well as reducing negative impacts on the financial system. Their continued operation in times of stress helps ensure continued confidence in the financial system, and reduce the likelihood, duration, severity, and ultimately cost of crises, which can bring large economic benefits given the costliness of financial crises.[52] Conversely, poor FMI design, rules, procedures or operation can mean that unnecessary exposures or frictions arise amongst market participants; in times of market stress, they could become channels of contagion or even amplification. Market functioning, and therefore financial stability, is dependent on the continuity and orderly operation of the critical services provided by FMIs. The Principles for Financial Market Infrastructures (PFMIs) establish globally-recognised standards for the regulation of FMIs to match the importance of their role, which serve as the foundation of the Bank's regulatory approach.

The use of CCPs has grown considerably since the introduction of mandatory central clearing of standardised over-the-counter (OTC) derivatives, agreed following the global financial crisis of 2007-2009. The value and benefits that CCPs offer can therefore be framed against a counterfactual of there being no such mandates for certain products. If this were the case and one party enters into a transaction, and the counterparty defaults, the non-defaulting counterparty could experience significant losses. Depending on the scale of loss, the non-defaulting counterparty could then default on other bilateral agreements with other counterparties. This could then cascade through the system, undermining broader confidence in the financial system, as occurred during the global financial crisis. While other mitigants exist (such as bilateral margining of derivatives contracts and resolution regimes ensuring that firms can fail in an orderly fashion), CCPs provide a critical service across the market by managing risks from counterparty default and provide significant efficiencies while doing so (see 'Economic value of FMIs' below).

In many cases, market participants have few, if any, practicable substitutes to FMI services. Disorderly insolvency of an FMI, or operational failure, could therefore lead to severe systemic

disruption. Given the cross-border nature of the services provided by FMIs, disruption of UK FMIs could extend beyond the United Kingdom. Well-designed regulation and supervision of FMIs is therefore essential to preserving financial stability. Consistent with that, the Bank undertakes its regulation and supervision of FMIs with a view to its primary objective of protecting and enhancing the stability of the financial system. This includes conducting regular CCP supervisory stress tests in order to assess CCP resilience, and to promote transparency and confidence in the UK financial system.

Absent regulation, FMIs may operate sub-optimally because of market failures, examples of which are noted below. Market failures can occur when traditional price discovery mechanisms are not able to capture or allocate the costs and benefits of certain activities, leading to inefficiencies and economic loss. For example, if FMIs are operated only in the private interests of their managers, owners, or even their members, they may under-invest in the mitigation of risks to the wider system, for which they would not pay the whole cost if they crystallised. The Bank's role as regulator is to ensure that appropriate rules and policies are in place to ensure that FMIs are managed and operated in a manner that is consistent with the public interest including reducing systemic risk,[53] by addressing these market failures.

This annex supports the Bank's Statement of Policy on its Approach to Cost Benefit Analysis (CBA) by articulating the economic rationale for FMI regulation through:

1. setting out the economic value of CCPs and CSDs in normal times as well as in times of stress;
2. examining the market failures that prevent FMIs from operating optimally, that regulation seeks to address;
3. highlighting how FMI regulation seeks to address market failures; and
4. the transmission channels through which well-designated FMI regulation can benefit the economy.

Economic value of FMIs

CCPs and CSDs create economic value in normal times and are particularly valuable in times of stress. The examples below are not meant to be exhaustive but aim to demonstrate the primary ways in which CCPs and CSDs provide economic value.

CCPs provide value through providing the critical service of clearing transactions such as derivatives, equities and commodities, which bring the following potential benefits:

1. **Multilateral netting:** CCPs increase the efficiency of posting collateral by simplifying outstanding exposures through netting, compared with a complex web of bilateral trades.[54] Increasing the efficiency of clearing through netting means that the amount of collateral required is reduced, which can lower costs – at a firm level this increases money available for

investment, or other productive uses. Operationally it is also more efficient as parties are posting collateral to one CCP rather than many counterparties. CCPs may also make use of compression algorithms that help to increase efficiency of clearing and further reduce overall exposures.

2. **Mutualisation of counterparty credit risk:** CCPs provide insurance against counterparty risk through the collection of margin and mutualised default fund contributions, as well as use of a CCP's own resources. This is because, unlike if there is a bilateral contract, if one clearing member using a CCP defaults, the default is managed centrally be the CCP and mutualised to some degree across the members using funds the CCP has already collected (including in the first instance the margin and default fund contribution of the defaulting clearing member). By sharing counterparty credit risk between their members in the markets in which they operate, well-designed CCPs bring asset prices closer to fundamental values through reducing the counterparty risk premium.[55]
3. **Mitigating fire sales through organised default management and transparent loss allocation:** CCPs have well understood processes in the case of member default, which can include auctions to incentivise good bids, and transparent loss allocation processes and collateral to cover losses. If a CCP member defaults, rather than liquidating the defaulting member's position and incurring losses paid for through margin, default fund and the CCP's own resources, the defaulting member's positions can be auctioned off or sold directly to other counterparties. This incentivises higher bids and prevents heavily discounted sales.
4. **Providing common frameworks:** CCP rulebooks provide common frameworks and embed common market practices, increasing standardisation and efficiency into their markets. This standardisation provides predictability, which increases broader confidence in the financial system and economy.
5. **Hedging risk exposures:** CCPs are one way that financial and non-financial institutions can hedge their risk exposures. Given the obligation to clear certain products, CCPs are necessary to allow for the use of derivatives to hedge certain activity. Hedging is a useful tool for financial actors as it allows them to reduce their exposure to certain types of risk.

In times of stress, as well as the points identified above, CCPs provide further benefit, through:

1. **Reducing overall exposures:** In times of stress, the benefits of multilateral netting are amplified. Through reducing exposures by netting at a CCP, CCP participants have greater liquidity in times of stress, when it is particularly important. Reducing exposures in times of stress can also help avoid disruption in services: regulations like the leverage ratio which may constrain trading are triggered by outstanding exposures, and so by reducing these CCP participants can carry on trading and supplying credit to the real economy.
2. **Ensuring confidence in the financial system**: In times of stress, it is particularly important that there is continuing confidence in the financial system to mitigate risk of reduction of provision of services and credit to the real economy. Counterparty credit risk is likely to

increase in times of stress, and this reduces trust in counterparties, leading to financial market participants withdrawing from the system. This restricts the provision of credit to the real economy. Additionally, having a simpler understanding of a single counterparty (ie the CCP) with a published rulebook and well understood processes helps mitigate potential loss of confidence in the financial system. In the Global Financial Crisis, chains of exposures to different bilateral counterparties meant that while one party may have known their exposure to another, they were not sighted on that party's exposures, and so their broader counterparty risk. CCPs allow participants to understand and manage their risk better in times of stress. A well-regulated CCP helps support confidence by providing transparency and acting as a fire break to stop contagion spreading.

3. **Managing default in an orderly way**: In times of stress, financial institutions, often multiple, can fail. CCPs can instil trust and confidence in the broader system through default management procedures which help manage such defaults in an orderly way. For example, in 2008, LCH supported the market by closing out or hedging the major risk exposures in Lehman's interest rate derivatives portfolio (which had a gross notional amount outstanding of US$9 trillion) within one week of Lehman's bankruptcy. In contrast, it was over four years before the first payment to Lehman's uncleared creditors was made.[56]

CSDs provide value through providing the critical service of settlement in equities and bonds while:[57]

1. **Reduced settlement risk:** Central banks and CSDs cooperate in the cash settlement of securities transactions in order to ensure delivery-versus-payment (DVP) settlement, which reduces settlement risk, which is the risk of paying cash without corresponding receipt of the security or vice versa. Reducing settlement risk more broadly supports confidence in the financial system.
2. **Facilitate settlement finality:** CSDs can also facilitate settlement finality, ensuring that payments and security transfer orders become final, even if the instructing party becomes insolvent.[58] This supports the stability and efficiency both of the CSD itself and the broader financial system.
3. **Providing a single source of trusted records:** CSDs maintain a reliable central record of settlements which is consolidated regularly to ensure a truthful representation of settlement and account balances. This ensures integrity of securities and reliable settlement, and clarity of legal ownership, with consequential effects on broader confidence in the financial system.
4. **Liquidity:** In the UK, efficient sequencing of settlement obligations in one CSD linked into the real time gross settlement (RTGS) system means materially lower prepositioning of liquidity for settlement. This releases cash into the broader financial system, which can be reinvested or used to support activity in the real economy.
5. **Supporting central bank and broader government operations**: Central banks rely on some CSDs for carrying out their monetary policy operations, and more broadly governments

rely on markets supported by CSDs for government securities to fund their budgets, manage their liquidity, and access information to develop their debt strategy. Difficulties in CSDs could disrupt the ability of central banks to implement monetary policy and undermine the credibility of the government's debt management program and undermine investor confidence.[59]

6. **Common frameworks:** CSD rulebooks provide common frameworks and embed common market practices, increasing standardisation and through that some efficiency into their markets. Without CSDs, there would be greater inefficiency losses through delays on settlement.

In times of stress, the points identified above are even more important. **CSDs ensure confidence in the financial system** by providing market participants the confidence that payment and settlement obligations will be made on time.[60]

Market failures

Policy proposals bring economic benefits for society when the benefits of the change are larger than the costs. From an overall financial stability perspective, this does not necessarily require that all individuals are better off as a result of the policy change, but rather that those who gain do so by more than the losers lose. It also does not necessarily require the economic benefits to exceed the costs immediately: the benefits might materialise over an extended period, whereas the costs might arise sooner.

In order to achieve a net economic benefit, a policy change must improve the level of economic efficiency in a given set of markets, or in line with the Bank's primary objective, increase the level of resilience in that market. Economic efficiency refers to the extent to which resources are being deployed to their highest-valued use in terms of the goods and services they create. Regulation can improve upon the economic efficiency of an unregulated market if that market is operating sub-optimally, including where there has been a 'market failure'. In an FMI context, this may mean that FMIs operate sub-optimally and act as transmitters or amplifiers of shocks in the financial system or introduce other risks into the market and economic costs into the wider economy.

Regulatory intervention can improve the efficiency or resilience of a given market by addressing market failures present within it. Conversely, regulations that are not directed at market failures can generate net economic costs by absorbing resources, such as technology or labour spent on compliance, without generating a commensurate improvement in efficiency or resilience. The existence of market failure alone does not justify intervention for the Bank. We intervene when market failures (i) present a risk to Bank objectives (are relevant and material), and (ii) can be mitigated by regulatory intervention.

Market failures that FMI regulation seeks to address include:

1. **Negative externalities:** This is where a third party faces an indirect cost as a result of the

actions of another party. Disruption to the services offered by a CCP or a CSD, or its failure, would have an impact both on its individual members and on the broader financial system and economy. FMIs may not understand or be properly incentivised to have adequate financial and operational resilience to protect against the negative externalities of disruption of their services.

2. **Moral hazard:** This is a situation where an economic actor has an incentive to increase its exposure to risk because it does not bear the full costs of that risk. CCPs have an incentive to clear as much as possible, to increase their revenue from membership fees and reinvestment of collateral. In the absence of regulation, CCPs may have an incentive to clear complex or risky products that are not adequately standardised, with insufficient market liquidity to support management of a clearing member's default, or without reliable pricing sources to support accurate margining.[61] CCPs could also be incentivised to gain market share through lowering margin requirements without having proper risk management in place (for example, through collecting too little margin and/or default fund contributions), which could make their failure more likely. FMI regulation such as skin in the game can rebalance the incentives for CCPs. Both CCPs and CSDs could also have misaligned incentives with parties reliant on them in under-investing in operational resilience to save costs, but then facing greater risk of disruption from operational outages, which they don't bear the full costs of.
3. **Network effects:** The value, efficiency, and subsequent attractiveness of some products or service increases when the number of people who use that product or service increases. CCPs and CSDs are examples of this. Given the efficiency and resilience gains through clearing or settling large volumes of similar products, they tend towards being monopolies or oligopolies in the markets they operate within. For CCPs this effect is achieved through the efficiencies gained through multilateral netting. As more participants use CCPs and CSDs, they offer more value, leading to a network effect. However, for CCPs and CSDs, given their highly concentrated nature, there may be less incentive to innovate, or invest in new technologies or systems. If network effects led to less competition, FMIs could also be incentivised to increase prices, though this may be mitigated through international competition for FMI services.
4. **Grid lock and co-ordination failures:** In some instances, firm may have incentives to increase profit from hazardous behaviour. In principle, CCPs may try to reduce standards in order to reduce the costs of their services to attract more business (often internationally). Conversely, CCPs have no certainty that other CCPs will also raise standards if they raise standards, meaning that if they do so and increase their costs then they risk their market share, so a grid lock can occur. No one firm or group of firms or customers can co-ordinate to solve this problem.
5. **Principal agent problem:** This is when the interests of one party (the principals) are not aligned with those of another party who make decisions on their behalf (the agents). This dynamic can play out in different forms. For example, the Bank of England could act as principal (as the financial stability authority), with the CCP as agent (as the day-to-day

manager of systemic risk), or the CCP participants could be the principals (who may bear the cost of any default), with the CCP as the agent (as the manager of counterparty credit risk amongst participants).

6. **Asymmetric/incomplete information:** This is where one party in a transaction has more information than the other. CCPs may have more information around exposures than any single participant. It is therefore important that participants have confidence in the CCP, so these information asymmetries do not reduce confidence or willingness to use its services.

Market failures can also arise through cognitive and behavioural biases at any type of organisation. These biases can increase risk-taking and magnify existing negative externalities, including the risk of financial crisis.[62] Examples of biases include short-termism (or 'present bias'), overconfidence and groupthink.

How FMI regulation addresses market failures

Given the value of CSDs and CCPs through the critical services they provide it is important that they function as intended. Market failures mean that they may not, and misalignment of incentives or misunderstanding of the systemic risks that CCPs or CSDs incur can cause or amplify shocks in the financial system.

Regulation is therefore an essential tool to help mitigate these market failures and help CCPs and CSDs function optimally from the perspective of the broader financial system and its stability. Well-designed regulation can mitigate market failures and lead to more efficient, economically valuable outcomes, but when poorly designed, can feed into broader issues and have unintended consequences.

It is worth noting that while the section below highlights some ways in which FMI regulation may affect the economy, it is highly complex to calculate the effects, and regulatory changes are complex in that they involve multiple mechanisms which may feed into each other and back on themselves (feedback loops).

Channels by which FMI regulation can provide economic benefit

The benefits of FMIs to the broader economy are significant but are difficult to quantify and therefore put a precise monetary value on. Financial stability allows the economy to perform its basic functions, even in times of stress. The Bank's regulation of FMIs seeks to solve the problems associated by the market failures by forcing firms to act more prudently or transparently than they may otherwise chose to do. In this way, regulation reduces the potential for negative externalities. This creates benefits for the economy through contributing to financial stability and realising the value of clearing and settlement services for the real economy described above through trusted use of their services, while fixing potential market failures. The channels the Bank envisages that FMI regulation provides economic benefit are therefore through:

1. **Maintaining financial stability:** CCPs and CSDs are a vital part of the UK's financial system and its wider economy. The UK's position on the global financial system also means UK CCPs and CSDs are also important to the financial systems of many other jurisdictions. While mitigating counterparty credit/settlement risk, they create concentration of risk and are systemic in nature. Downtimes in clearing and settlement can have negative repercussions on the availability of liquidity or management of financial risks for the affected participants and lead to serious disruptions. FMI regulation ensures that they provide their services under financial and operational stress, and in extreme scenarios reduces the likelihood, severity, duration and ultimately cost of crises (see Box A1.A).
2. **Realisation of the value of clearing and settlement services to the real economy, through trusted use of their services:** The use of clearing arrangements is affected by the willingness and ability of market participants to use the services provided. The use of clearing/settlement arrangements can be determined by:

(a) The confidence of market participants. A lack of confidence in CCPs could result in members not clearing and therefore not managing their risks and exposures. For CSDs, if settlement took place outside of CSDs it may increase the level of settlement failure, which for bonds/equities would mean that less money was being channelled into the real economy.

(b) The operational resilience of the clearing/settlement facilities. Connected to the above, firms must be able to reliable in their provision of services, and able to recover swiftly in the event of failure.
(c) Innovation in FMI services. This may improve the attractiveness of the services offered, for example in its quality or efficiency.

Box A1.A: Historical examples of FMI disruption

One of the main channels by which FMI regulation is justified is to maintain financial stability through reducing the likelihood, severity, duration and ultimately cost of crisis in times of stress. However, it is very difficult to precisely quantify the extent to which a particular policy affects the likelihood, severity, duration and cost of crises. There is also limited literature on cost of crises originating in FMI failure or disruption, and even fewer examples in literature of FMI failures following the development of the modern FMI regulatory regime after the global financial crisis, importantly including effective resolution regimes and uncleared margin rules.

There are however some historical examples of FMI disruption, and near or actual failure, which we note below, which can be instructive in a qualitative assessment of the impact of FMI failure. There is also a more developed pool of literature of banking failures that we can learn from, as well as the consequences of disruption to other critical infrastructure.[63]

The various examples of FMI failures can give a good understanding of what happens when a crisis does occur.

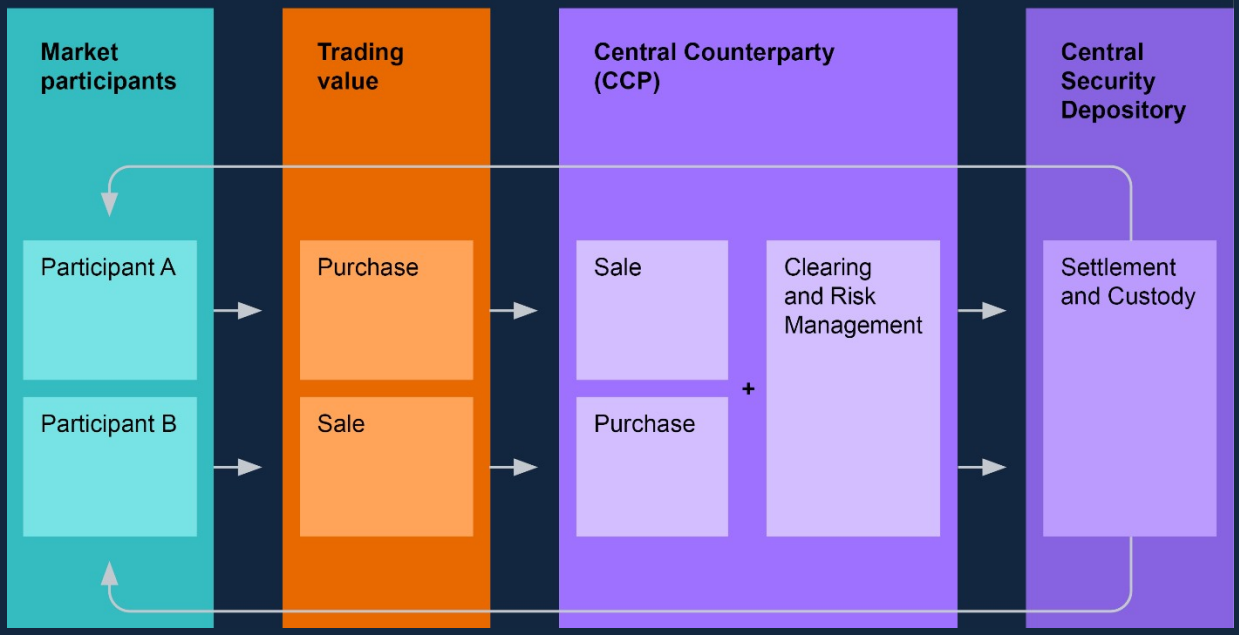
1. **Lehman Brothers (2008):** When Lehman Brothers failed in September 2008, its uncleared derivative counterparties filed claims totalling $51 billion. However, while the Lehman Brothers UK subsidiary had $9 trillion in cleared interest rate derivatives at LCH Ltd (LCH), LCH managed to hedge and close out the entire position, only using about a third of the collateral that Lehman had deposited.[64]. While the default on its uncleared portion of its derivatives exposure precipitated wider financial contagion, the cleared book, with appropriate margining, helped to dampen the shock of a major counterparty failure. Other CCPs also successfully managed the failure of Lehman, and other defaulting members during the Great Financial Crisis. This was one factor in the G20 leaders mandating greater use of central clearing after the financial crisis.
2. **Nasdaq Clearing AB (2018):** When a clearing member defaulted on a concentrated position in an illiquid market, the defaulter's position was auctioned off, which resulted in a loss for Nasdaq's other clearing members of €114 million more than the collateral.[65] While the default waterfall absorbed the loss, it is unusual for a CCP to exhaust the defaulter's collateral. This episode emphasised the importance of maintaining sufficient market liquidity for central clearing to support default management in stressed conditions and of applying a reliable long-term perspective to set accurate margins. It also incentivised regulators to more seriously consider resolution regimes for CCPs.
3. **The New Zealand Futures and Options Exchange (1989):** A clearing member default led to a temporary market closure and broader financial market instability.[66] Government authorities were forced to intervene to shore up the market, and other clearing members suffered losses above the defaulting member's collateral.
4. **The Hong Kong Futures Exchange (1987)**, **the Kuala Lumpur Commodities Clearing House (1983) and the French Caisse de Liquidation (1973)**:[67] These crises (which came about before the expanded clearing mandate, and the international standards for CCPs, the PFMI), highlighted key causes of failure, including where incentives for CCPs do not align with responsible financial risk management, and concentrations on particular clearing members, as well as inadequate supervision.

Annex 2: The role of CCPs and CSDs

As set out in the introduction to this SoP, CCPs and CSDs lie at the heart of the financial system and deliver benefits for their participants and financial stability. They do this through putting in place sets of rules, processes, and operational arrangements for managing, reducing, and allocating the inherent risks arising from transactions between market participants. CCPs have a particularly central role due to the mandatory central clearing of some OTC derivatives, which seeks to reduce complexity and improve transparency in the OTC derivatives markets. CCPs and CSDs have therefore become increasingly interconnected, and central to financial markets (see Figure A2.1 below for the role of CCPs/CSDs in a typical exchange traded transaction).[68]

As such, the Bank of England's regulation and supervision of CCPs and CSDs are key to upholding financial stability through ensuring continuity of essential FMI services. As the continuity of FMI services is key, FMI regulation ensures the financial and operational resilience of FMIs. Financial resilience of FMIs ensures that they hold sufficient financial resources to perform their risk management functions and meet losses, giving confidence to their members. It also includes regulation that enhances their operational resilience, both to minimise the likelihood of disruption of occurring and enabling FMIs to recover from it when it happens. This is consistent with FMIs' role as supporting critical national infrastructure in maintaining the stability of the UK's financial sector, due to it being essential to the functioning of the economy and broader society, in common with other infrastructures such as telecommunications and energy. [69]

Figure A2.1: Simplified financial transaction highlighting the role of CCPs and CSDs



Central counterparties (CCPs)

The primary purpose of CCPs is to manage counterparty credit risk. Counterparty credit risk is the risk that one party to a contract 'defaults' and cannot meet its obligations under the contract. This can lead to a loss for the counterparty on the other side of the contract. If those losses are severe enough, they may cause the affected parties financial distress which, in turn, can have a knock-on effect for their creditors. CCPs therefore play a critical role in managing potential contagion and sources of systemic risk.[70]

CCPs manage counterparty credit risk in the financial system by placing themselves between the buyer and seller of an original contract (see Figure A2.2).[71] CCPs also create efficiencies through simplifying outstanding exposures compared with a complex web of bilateral trades, known as 'multilateral netting'. Multilateral netting is a key way in which CCPs reduce risk in aggregate by reducing the exposures that market participants face across the system, and also allow those participants to make more efficient use of financial resources.

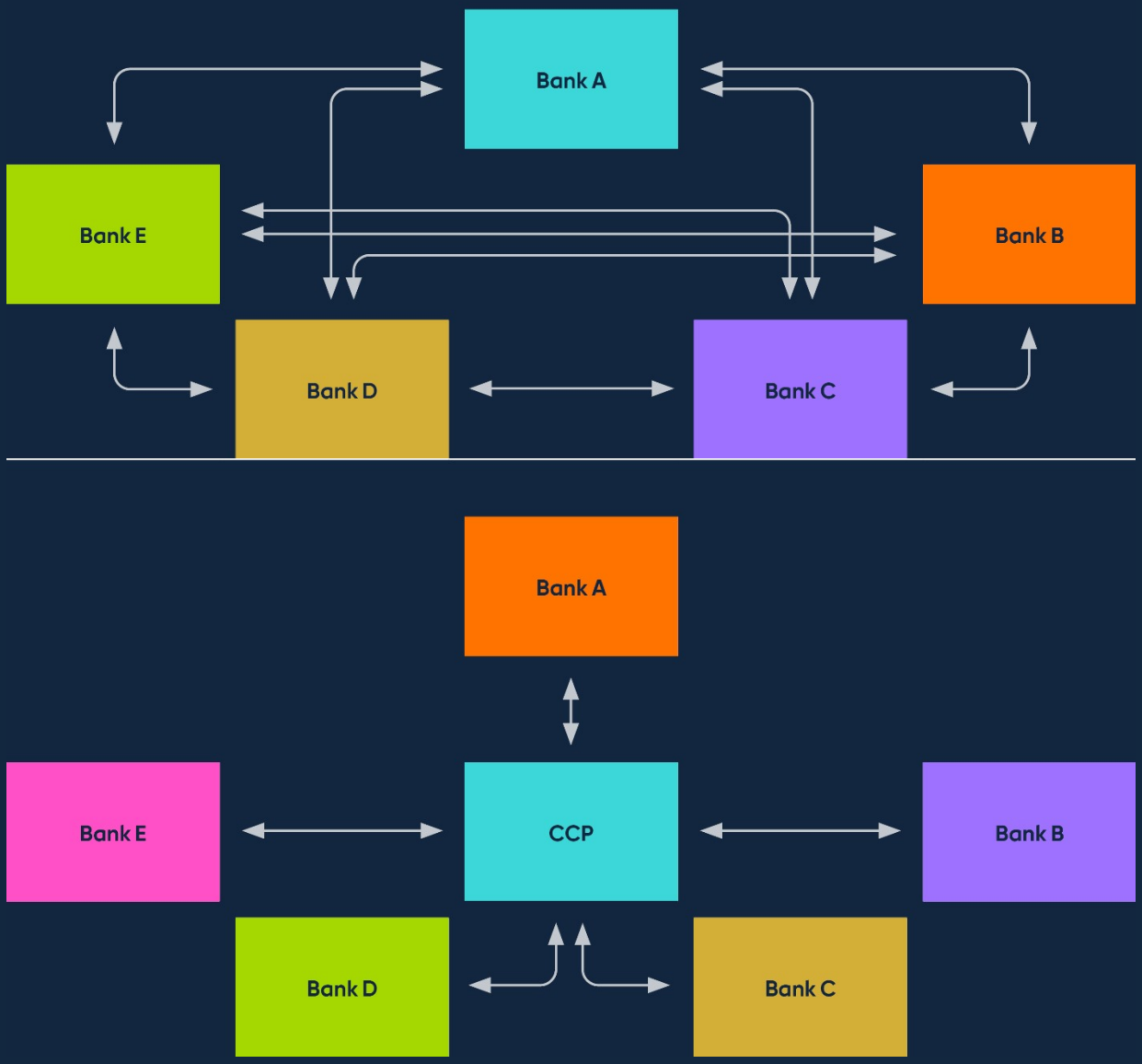
To fund the guarantee that CCPs provide, they require financial resources, or 'margin' from participants to cover the risk of the participant not being able to fulfil their obligations in case of a member default (see Box A2.A). The margin is calculated by CCPs to reflect their estimate of the riskiness of the initial transaction, or actual market moves. This makes up part of the first tranche of financial resources with the defaulter's default fund contributions, and above the CCP's own

resources and the surviving members' prefunded default fund contributions as described in Figure A2.3. This is because, unlike if there is a bilateral contract, if one clearing member using a CCP defaults, the default is managed centrally by the CCP and mutualised to some degree across the members using these funds.

If a CCP participant defaults, the CCP has rules, processes, and financial resources in place to manage such a default in an orderly way. If one counterparty fails, the other clearing members have confidence they are protected through the default management procedures, including the financial resources (outlined above). This transparent loss allocation mitigates the risk of fire sales in the case of participant default.

As a consequence of clearing trades centrally, as well as the financial requirements that CCPs place on their members, CCPs are themselves crucial nodal points in the financial network and are highly interconnected to other financial institutions. For this reason, it is important for CCPs to manage properly both risks to themselves and risks stemming from their activities to the markets they serve.

Figure A2.2: A complex 'web' of bilateral exposures is reduced to a simpler network through a CCP



Box A2.A: Margin[72] and loss allocation at CCPs[73]

Margin – collateral collected by CCPs – is an essential part of managing counterparty credit risk at CCPs. It is exchanged to reflect potential or actual changes in the value of a cleared financial contract, meaning that one party to the contract is not left out of pocket if the other party fails. Margin is the first tranche of financial resources used if there is a defaulting participant at a CCP and must be composed of collateral that is highly liquid and available for use. Collection of appropriate levels of margin reduces the risk that the

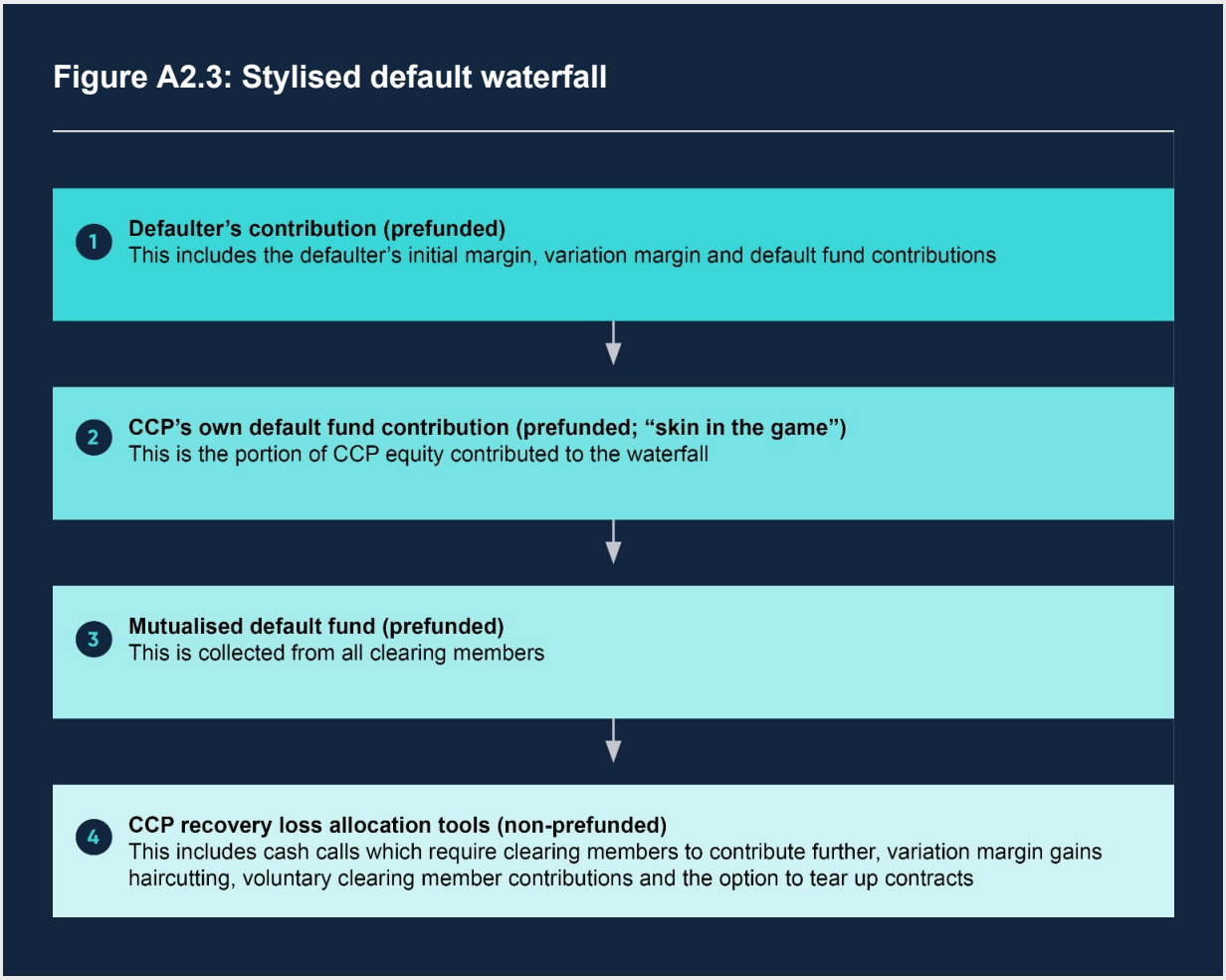
failure of one counterparty causes losses or defaults for other counterparties.

There are two types of margin. Initial margin protects against potential future changes in the market value of contracts following a counterparty default. Unprecedented changes in market prices increase the chances of larger price changes, so initial margin tends to increase with market volatility. Variation margin reflects day-to-day changes in the market value of contracts. Larger movements in market prices therefore feed through to larger amounts of variation margin.

If a CCP member defaults the CCP has financial resources in place to manage the default in an orderly way, including margin. The sequencing of the various financial resources is known as a ‘default waterfall’. The default waterfall is a dedicated stack of financial resources contributed by its members and the CCP itself that can be used to cover the costs of managing a clearing member default. The standard CCP default waterfall includes up of three tranches of prefunded financial resources which are used in the following order (see figure A2.3):

- The defaulting member’s prefunded contribution (initial margin, variation margin, and default fund contribution).
- The CCP’s own default fund contribution (‘skin in the game’).
- Mutualised default fund (prefunded). This is collected from all clearing members.

Figure A2.3: Stylised default waterfall



Beyond these layers of prefunded financial resources, CCPs have loss allocation powers and other tools such as contract tear up to manage the risks from a member failure, such as rights of assessment (to call for additional funds from clearing members), powers to haircut amounts due to be paid to clearing members (Variation margin gains haircutting (VMGH)), and powers to tear up some contracts to return the CCP to a 'matched book' where it has otherwise been unable to auction or sell a defaulter's positions. Of course, in following such actions, CCPs (and authorities) would need to be mindful of the impact that such actions would have on their participants in already stressed market conditions and aim to apply the actions in a way that does not amplify stress.

Central security depositories (CSDs)

CSDs[74] help to reduce settlement risk, which is the possibility of the party to a contract (for example, the purchase of securities) failing to deliver on the terms of that contract, leaving the other party out of pocket. CSDs enable securities to be transferred and settled according to a set of predetermined multilateral rules. Such systems allow transfers of securities either free of payment or against payment. When transfer is against payment, many systems provide delivery

versus payment (DvP), where delivery of the security occurs if and only if payment occurs. Through efficient sequencing of settlement obligations, CSDs can minimise the intra-day borrowing needs of settlement members, releasing cash into the broader financial system, which can be reinvested or used to support activity in the real economy.

Importantly, CSDs also provide settlement finality in securities transactions, giving legal certainty over payments and security transfer orders even if an instructing party becomes insolvent or if there is another form of disruption to a transfer. This supports the stability and efficiency both of the CSD itself and the broader financial system.

CSDs also provide securities accounts, central safekeeping services, and asset services, which may include the administration of corporate actions and redemptions and play an important role in helping to ensure the integrity of securities issues (that is, creating a single 'source of truth' on securities). A CSD can hold securities either in physical form (but immobilised) or in dematerialised form (that is, they exist only as electronic records). Finally, CSDs also support broader central bank operations and government debt management. CSDs are used for settlement of monetary policy operations, and governments rely on CSDs to settle primary and secondary market transactions in their debt.

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1. For more information on the role of CCPs and CSDs see Annex 2, and for more information on the economic case for FMI regulation, see Annex 1.
2. The terms 'recognised central counterparty', 'recognised CSD', 'recognised clearing house', 'third country central counterparty' and 'third country CSD' have the meaning provided for in section 285 of FSMA.
3. A CTP is an entity that will be designated by HM Treasury (HMT) by a regulation made in exercise of the power in section 312L(1) of the Financial Services and Markets Act (FSMA) as amended by the Financial Services and Markets Act 2000 (FSMA 2023).
4. These rule making powers include those under sections 300F and 300G the general rule-making power for CCPs, CSDs, third country CCPs and third country CSDs inserted by section 9 of the Financial Services and Markets Act 2023 (FSMA 2023). S.300G FSMA provides (among other things) that the power of the Bank to make rules in respect of third country CCPs is exercisable, except in the case of 'systemic third country CCPs', only so far as is authorised by regulations made by the Treasury. Systemic third country CCPs are defined by s.300G(7) as any third country CCP that the Bank has determined is systemically important, or is likely to become systemically important, to the financial stability of the United Kingdom. The rule making powers also include those under section 312M FSMA for CTPs designated by HMT under section 312L of FSMA.
5. Throughout, references to the Bank as FMI regulator are specifically in relation to its role under part 18 FSMA as regulator of CCPs, third country CCPs, CSDs and third country CSDs. There are not currently any RCHs, as such that category of financial markets infrastructure presents an empty set for the purposes of part 18 FSMA.
6. References to the Bank's policy-making process are references to the Bank rule making for public consultation under section 138J(1)(b) of FSMA as applied by paragraphs 10 and 10A of Schedule 17A of FSMA.
7. As required by section 138JB of FSMA.
8. This SoP also sets out any criteria for determining when we will not consult the CBA Panel on CBAs. As set out in Section 5 as at the time of publication, the Bank will consult the CBA Panel on all CBAs and will update this SoP

should it develop any criteria for not consulting the CBA Panel in the future.

9. **The Bank of England's supervision of financial market infrastructures Annual Report: 16 December 2022–15 December 2023**.
10. **Bank of England Quarterly Bulletin 2013 Q2**.
11. For more detail on the role of CCPs and CSDs, see Annex 1 on the Economics of FMI regulation Section 3 'Why we do cost benefit analysis'.
12. **Bank of England Quarterly Bulletin 2013 Q2**.
13. **Speech by Jon Cunliffe at the FIA International Derivatives Expo 2018, London, on Tuesday 5 June 2018 (bankofengland.co.uk)**.
14. **Incentives to centrally clear over-the-counter (OTC) derivatives (fsb.org)** and **OTC derivatives statistics at end-June 2023 (bis.org)**.
15. **Principles for Financial Market Infrastructures (PFMI) (bis.org)**.
16. The UK finance sector is designated as a Critical National Infrastructure Sector by the National Protective Security Authority (NPSA), as a system that is necessary for a country to function and upon which daily life depends: **Critical National Infrastructure | NPSA**.
17. For more information on the role of CCPs and CSDs see Annex 2, and for more information on the economic case for FMI regulation, see Annex 1.
18. In CBA we assess economic costs and benefits. In this document the term 'impacts' is sometimes used as shorthand for 'economic costs and benefits'.
19. As set out in the regulatory principles the Bank is required to have regard to when exercising its functions (including its rule making power) in relation to FMIs pursuant to section 30E of the bank of England Act 1998, proportionality is the regulatory 'principle that the burden or restriction which is imposed on a person, or on the carrying on of an activity, should be proportionate to the benefits, considered in general terms, which are expected to result from the imposition of that burden or restriction'.
20. The Secondary Innovation Objective applies to the Bank in its exercise of FMI functions, as defined in section 30D(3) of Bank of England Act 1998 (BoE Act).
21. Set out in Section 30D and 30E of the Bank of England Act 1998.
22. For more information on the Bank's description of financial stability, please see **The Bank's Financial Stability Strategy | Bank of England**.
23. Costs arise in cases where regulatory requirements diverge from existing business practices, which are in turn determined by firms' consideration of their private costs and benefits.
24. Set out in Section 30D and 30E of the Financial Services and Markets Act 2023.
25. FSMA Section 138J(8), applied to the Bank as FMI Regulator by Schedule 17A.
26. These are the frameworks of the Australian, Canadian, UK and US governments, the European Union, and the FCA. The UK government framework is **The Green Book**.
27. See FSMA section 138L(5)(a), applied to the Bank as FMI Regulator by Schedule 17A. Where a CBA is required under section FMSA 138J(5)(a) (applied to the Bank as FMI Regulator by Schedule 17A), because the PRA Bank is making final rules which differ significantly from those on which it consulted, then see section 138L(5)(b) (applied to the Bank as FMI Regulator by Schedule 17A).

28. The Bank of England's **Financial Policy Committee | Bank of England** is responsible for ensuring such emerging and growing risks across the financial system are identified, monitored and effectively addressed.

29. Where a change is made to implement an international agreement, or legislation made by the government, the scope for a CBA to inform policy, and hence the resources to be put into CBA, will be less than where this is not the case.

30. As required by FSMA 2000.

31. This is particularly challenging for the Bank as FMI regulator, given the small sample size of firms from which to draw data from.

32. Costs in this context refers to the Bank resources required and the risks associated with the delay of policymaking that be required to give sufficient time to expand our toolkit.

33. As required by section 138J(8) FSMA, applied to the Bank as FMI Regulator by Schedule 17A.

34. As set out in section 138L of FSMA.

35. Schedule 17A applies 138L(2) to the Bank as if the reference to safety and soundness is a reference to financial stability.

36. As required under section 138J FSMA, applied to the Bank as FMI regulator by Schedule 17A.

37. As required by section 138J(5)(a) FSMA, applied to the Bank as FMI regulator by Schedule 17A.

38. As required by FSMA 2000 under s.138J(7) and (8), applied to the Bank as FMI Regulator by Schedule 17A.

39. Consistent with central government guidance on the need for policymakers to identify a Theory of Change. Magenta Book, Section 2.2.1; available here: **The Magenta Book – GOV.UK**.

40. Given the infrequency of financial crises, historical events can be relevant.

41. The Bank is a member of the Committee on Payments and Market Infrastructure (CPMI). The CPMI sets international standards, working alongside other international bodies like the International Organisation of Securities Commissions (IOSCO) and the Financial Stability Board (FSB).

42. Rule reviews would aim to assess if established rules are operating effectively and delivering their intended impact.

43. Note that for the purpose of this SoP, 'Identifying' and/or 'assessing' costs or benefits refers to judging that the cost or benefit will occur, while 'estimating' costs or benefits refers to estimating a quantitative value for that cost or benefit.

44. The Bank would avoid double counting costs here, so if costs were passed onto firms, we would count that as a direct cost to firms, rather than the Bank.

45. Under the Bank of England Act 1998 FMI services is defined as services provided by FMI entities as part of their business as FMI entities.

46. See **PRA cost benefit analysis panel – terms of reference**.

47. The same requirement applies to the PRA.

48. The Panel will consider how it will assess the outcomes of CBAs ex-post.

49. **Statement of policy – Panel appointments by the PRA and the Bank of England**, October 2023.

50. In exercising its FMI functions in a way that advances the Financial Stability Objective the Bank must, so far as reasonably possible, act in a way which, as a secondary objective, facilitates innovation in the provision of FMI services (including in the infrastructure used for that purpose) with a view to improving the quality, efficiency and economy of the services.

51. FMIs generally also include payment systems, but in the context of this document, only refer to CCPs and CSDs. For

more information see here: **Financial market infrastructure supervision | Bank of England**.

52. Following the global financial crisis that ignited in 2007, UK GDP fell by 6%. This marked the deepest recession for 80 years **Why does economic growth matter? | Bank of England**)
53. **Supervision of financial market infrastructures – April 2013 (bankofengland.co.uk)** .
54. See **Central counterparties: what are they, why do they matter and how does the Bank supervise them?** .
55. The Economics of Central Clearing, Albert J. Menkveld and Guillaume Vuillemey.
56. **Financial Stability Report November 2017 | Issue No. 42 (bankofengland.co.uk)** .
57. **How to Notes: How to Organize Central Securities Depositories in Developing Markets – Key Considerations in: IMF How To Notes Volume 2019 Issue 001 (2019)** .
58. **The Financial Markets and Insolvency (Settlement Finality) Regulations 1999** .
59. **How to Notes: How to Organize Central Securities Depositories in Developing Markets—Key Considerations in: IMF How To Notes Volume 2019 Issue 001 (2019)** .
60. See **How to Organize Central Securities Depositories in Developing Markets** .
61. Sidanius, C and Wetherilt, A (2012), '**Thoughts on determining central clearing eligibility of OTC derivatives**', Bank of England Financial Stability Paper No. 14.
62. See **Psychology and the Financial Crisis of 2007–2008** .
63. **An overview of UK Critical National Infrastructure** .
64. **Speech by Jon Cunliffe at the FIA International Derivatives Expo 2018, London, on Tuesday 5 June 2018 (bankofengland.co.uk)** .
65. **Two defaults at CCPs, 10 years apart (bis.org)** .
66. **Central counterparties in crisis: International Commodities Clearing House, New Zealand Futures and Options Exchange and the Stephen Francis Affair – Journal of Financial Market Infrastructures (risk.net)** .
67. **Examining the Causes of Historical Failures of Central Counterparties | Bulletin – June 2021 | RBA** .
68. **Public Register for the Clearing Obligation (bankofengland.co.uk)**.
69. **Critical National Infrastructure | NPSA** .
70. **Bank of England Quarterly Bulletin 2013 Q2** .
71. The trades that CCPs help to clear, and further background to why the clearing obligation was introduced can be found here: **Central Clearing and Resolution – learning some of the lessons of Lehmans - speech by Jon Cunliffe | Bank of England**.
72. **What role did margin play during the Covid-19 shock? | Bank of England**.
73. **Bank of England Quarterly Bulletin 2013 Q2** .
74. In the UK CSDs may also operate a securities settlement system (SSS), and in this document, when referencing CSDs, this includes SSS functionality.