

CCPs and Banks: Different Risks, Different Regulations

David Hughes and Mark Manning*

Recent debate on the adequacy of regulatory standards for central counterparties (CCPs) has often drawn on the experience of bank regulation. This article draws out the essential differences between CCPs and banks, considering the implications of these differences for the regulatory approach. It argues that banks and CCPs affect systemic stability in different ways, with a CCP's systemic importance largely derived from its central role and a bank's systemic importance typically derived from the size and breadth of its activities. Any refinements to regulatory standards for CCPs that are drawn from bank regulation should not overlook these differences.

Introduction

Since the global financial crisis, CCPs have assumed a more prominent role in the financial system. As central clearing mandates for over-the-counter (OTC) derivatives have been introduced around the world, an increasing share of wholesale financial market transactions is being centrally cleared. As the systemic importance of CCPs has grown, the debate has intensified as to whether new international regulatory standards for CCPs introduced in 2012 promote sufficient resilience in CCPs. This debate often draws on the experience of bank regulation.

This article first describes the respective roles of banks and CCPs and how these roles naturally give rise to very different risk profiles and different financial and market structures. It goes on to demonstrate that, while both banks and CCPs can be systemically important and a potential source of financial contagion, the nature of their systemic importance differs. The regulatory frameworks developed respectively for banks and CCPs appropriately reflect these differences. The article concludes with the argument that, while it is important to continuously review and challenge regulatory frameworks, any

refinements to the CCP regime should not overlook the differences between banks and CCPs.

Context and Motivation

Following the global financial crisis, standard-setters for both banks and CCPs have strengthened their respective international regulatory frameworks. For banks, the motivation for stronger standards has been to reflect the harsh lessons of the crisis. In the case of CCPs, which performed well in the crisis, policymakers have recognised the importance of ensuring that CCPs could credibly support the G20's commitment that all standardised OTC derivatives should be centrally cleared.

In 2012, the *Principles for Financial Market Infrastructures* (PFMI), the international standards for CCPs and other financial market infrastructures (FMIs), were developed by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) (CPSS-IOSCO 2012). At the time of writing, policymakers and industry participants are debating the adequacy of CCP resilience and recovery requirements under the PFMI. There has been particular focus on the calibration of pre-funded financial resource requirements, stress-testing approaches, the CCP's 'skin in the

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game' and unfunded loss allocation in recovery and resolution (e.g. JP Morgan Chase 2014; Powell 2014; Coeuré 2015; FSB 2015a; ISDA 2015). Since industry participants are required to assume exposures to CCPs under new central clearing mandates for OTC derivatives, they are appropriately seeking assurances that CCP risks are well managed.

In examining the case for refinements to the existing regulatory standards for CCPs, it is important that the risk and supervisory frameworks for banks and CCPs remain tailored to the specific roles assumed by these entities and the different profiles of their risk exposures. Indeed, almost every aspect of banks' and CCPs' businesses is different: their respective roles in the financial system; their risk profiles; the nature of their interconnections with other financial institutions; the contractual basis for their activities; and the market structures in which they operate.

The Roles and Risk Profiles of CCPs and Banks

A CCP's main role and purpose is to centralise counterparty risk management in the financial markets that it serves.¹ In performing this role, it also provides other benefits, including netting, operational efficiencies, coordination and trading anonymity. Its risk profile is dictated by the characteristics of its participants and the positions that they clear. Standing between the original buyer and seller in a financial contract – typically trading banks acting on their own account or on behalf of non-bank clients – the CCP guarantees the performance of obligations on each side over the life of the contract or trade. This may be days, for example, the pre-settlement period in the case of a securities trade; or it may be many years, and involve periodic cash flows, in the case of some derivatives.

In the absence of a default, the CCP operates with a 'matched book'. That is, since the CCP interposes itself between the buyer and seller, every 'long' position is matched by an equal and opposite 'short' position. The CCP is therefore market-risk neutral. In

the event of a participant default, however, the CCP would assume the obligations of the defaulted party. In this way, the risk of loss to a CCP is conditional on the default of one or more of its participants. This underscores the natural interdependence between the risk profile of a CCP and that of its bank participants.

The primary financial risk to a CCP is therefore 'replacement cost risk'; that is, the risk that the replacement trades required to return the CCP to a matched book can only be executed at an adverse price.² However, the CCP is only exposed to this risk over the 'close-out period', the time it takes to execute these offsetting trades – typically assumed to be two to five days, depending on the characteristics of the contract. A participant default also exposes the CCP to liquidity risk; that is, the risk that it cannot meet payment obligations on time (e.g. mark-to-market, or variation, margin payments that are no longer received from the defaulted participant must still be paid out to the surviving participants).

A bank, by contrast, operates with a fundamentally different purpose and risk profile. A bank typically engages in three main activities: providing transaction services to households and corporations (e.g. deposit accounts); extending credit; and trading and investment banking.³ In performing these activities, a bank engages in liquidity and maturity transformation – taking short-term liabilities such as deposits and extending longer-term credit for the purchase of often illiquid assets such as housing or business investment. Banks are exposed to the credit risk of their borrowers, as well as the liquidity risk that arises from the mismatch between their funding sources and assets. Banks often also provide trading, investment banking and agency services to clients, intermediating access to capital markets for both issuers and investors (e.g. through origination,

2 Following the default of a participant, the CCP no longer has a matched book and must act quickly to replace the lost trades in the market. For the period between the default of the participant and the time the CCP replaces its trades – known as the close-out period – the CCP bears the market risk of the defaulter's positions.

3 See Merton and Bodie (1995) for a discussion of the key functions of financial institutions.

1 See Pirrong (2011) for a summary of the economics of central clearing.

underwriting, market-making and brokerage activities), often assuming direct credit, market and liquidity risks. This may include supporting access to FMIs, including CCPs, e.g. through client clearing and custodial services. These infrastructure-like services both carry a distinct risk profile and remain a particular source of interdependence between banks and FMIs.

CCPs and banks also operate in very different market structures. In any given financial market segment, there will typically be just one CCP, or at most very few CCPs. This reflects: economies of scale in the provision of CCP services; network externalities arising from the multilateral netting of offsetting exposures; the operational efficiency of connecting to just one CCP in any given market; and the efficiency of having only a single entity to monitor (and to whom the monitoring of others can be delegated).

By contrast, any given customer segment or financial market will typically be served by several banks. While there are also clear economies of scale in banking, there are fewer network externalities and efficiencies that tie customers to a single provider. Accordingly, in any given customer segment or financial market, there will often be oligopolistic competition. For those banking services that are more infrastructure-like in nature, however, – for instance, custodial and clearing services – the market structure has similarities to that of CCP clearing.

A large, complex bank will also typically be exposed to a wide variety of risks, with a broad geographical scope, both wholesale and retail customers and activities, and often exposures to a range of derivative and securities markets. A CCP, by contrast, will often be active in a much narrower range of financial markets – sometimes providing clearing services for a single exchange or OTC market segment – giving the CCP a holistic view of activity in the product markets that it serves.

Risk Controls

A key benefit to a market participant of using a CCP is that it need only monitor the CCP and not its bilateral counterparties. The CCP must therefore demonstrate that its performance guarantee is credible and robust to the default of its participants. That is, it must demonstrate that it has the financial capacity to effectively manage the financial risk that it would assume in the event of one or more participant defaults.

To do this, a CCP holds margin and other pre-funded financial resources against the risk that participants bring to the CCP, operating on a close to fully collateralised basis. A CCP collects variation margin from each party at least daily to fully cover all observed price movements, and collects initial margin in respect of each cleared position to cover potential future exposure with a high degree of confidence (should that participant default).

The CCP typically strengthens this guarantee by maintaining a pool of additional pre-funded resources to supplement a defaulted participant's margin should it prove to be insufficient. Recognising that the risk profile of a CCP reflects the positions of its participants, most CCPs operate a mutualised model, with this additional pool of funds primarily made up of participant contributions. Margin and other pre-funded financial resources are held in high-quality and liquid assets to maintain participants' confidence in the CCP's capacity to realise their value in the event that they need to be liquidated, even in stressed market conditions. Finally, a CCP will often have mechanisms within its rules to allocate any unfunded losses or liquidity shortfalls to participants.

To manage its risks, a bank operates with a mix of collateral and capital. Most assets – for example, household mortgages – are collateralised, with the collateral reducing the size of the loss incurred in the event of a default. A bank additionally maintains loss-absorbing capital (equity and other loss-absorbing liabilities) sufficient to cover potential losses on its assets to a set level of confidence.

Since liquidity transformation is at the core of a bank's role, liquidity risk management is also important. An inherently unstable asset-liability structure exposes a bank to potential liquidity shocks and funding issues. Accordingly, a bank maintains a sufficient proportion of its assets in liquid form to be able to withstand an increase in withdrawals by its customers, or a loss of short-term funding. In contrast, a CCP will typically only face liquidity issues in the case of a participant default, as incoming funds, such as variation margin or settlement flows, will normally meet obligations to other participants.

It is also notable that a CCP's operations are defined by a detailed 'rule book', covering all aspects of the CCP's activities. While it is appropriate that a CCP's rule book affords the CCP some discretion, particularly in the event of a participant default, it limits the scope for a CCP to assume discretionary proprietary financial exposures. Indeed, typically the only discretionary financial decisions that a CCP will take relate to the reinvestment of any cash collateral that it receives from participants. This means that even a for-profit CCP enterprise would only pursue profit by taking 'risky' decisions in a naturally tempered manner. Pursuit of profit is further constrained by the usual mutualised model of a CCP, whereby residual risk exposure not covered by margin is largely shared among participants, who naturally take a close interest in the CCP's decisions.

Balance Sheets

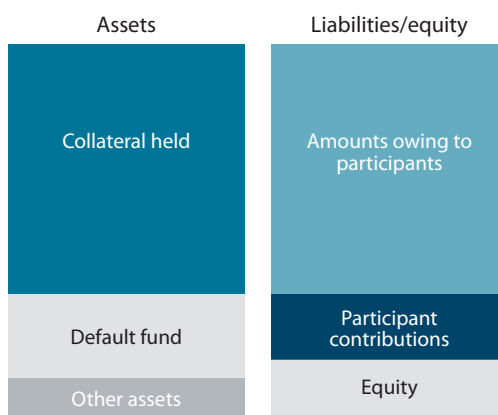
Given their respective risk profiles and the risk controls that they apply, CCPs' and banks' balance sheets are very different.

- The bulk of the assets held by a CCP are the collateral (margin) and default fund contributions that it receives from participants against cleared positions (Figure 1(a)). These assets are ultimately funded by obligations to return unused funds to the providing participants. The CCP will also typically make a contribution to the default fund and hold a small amount of proprietary assets

in liquid form for business risk management purposes; both are funded by equity. A CCP typically maintains no debt and therefore does not operate on a leveraged basis.

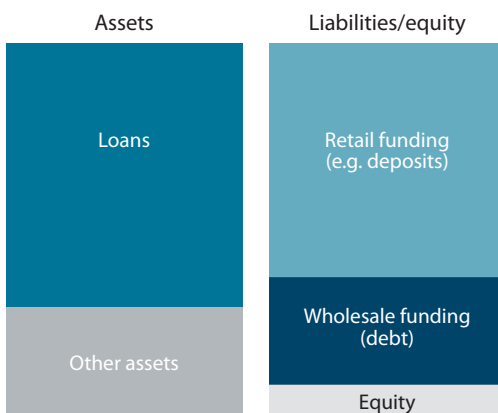
- A bank's balance sheet, by contrast, is typically highly leveraged, comprising a mix of loans and other assets (such as trading assets and liquid assets) backed by a mix of deposit funding, wholesale debt funding and equity capital (Figure 1(b)).

Figure 1(a)
Stylised CCP Balance Sheet



Source: RBA

Figure 1(b)
Stylised Bank Balance Sheet



Source: RBA

Systemic Importance

A systemically important institution, or infrastructure, can be defined as one that is so important that its distress or failure would impose material losses on the real economy (RBA 2014). Both large, complex banks and CCPs can be systemically important, although the channels by which they could impact financial systems and the real economy are very different.

The Basel Committee on Banking Supervision (BCBS) has suggested five key indicators for measuring the systemic importance of banks in its global systemically important banks (G-SIBs) framework (BCBS 2013b) (Table 1). These indicators are also likely to be relevant for a CCP, but the relative importance of each indicator will differ, as will the relevant metrics.

In most cases, a bank's systemic importance will arise from the size, breadth and complexity of its activities, and its network of financial market interconnections. In the case of a CCP, size does not necessarily determine importance. Rather, systemic importance is more a function of the central role that a CCP plays in a given financial market and its lack of substitutability. A CCP's systemic importance is interdependent with the systemic importance of its participants and the markets it serves. Indeed, it is almost misleading to consider the systemic importance of a CCP in isolation. Given its role and structure, a CCP cannot in general be an initial trigger for stress, since a CCP will only transmit stress following the failure of one or more of its participants or an investment counterparty.⁴ In such circumstances, a CCP would redistribute any unfunded losses generated by a participant failure to its remaining participants, as would have occurred in the CCP's absence (although with a different distribution across counterparties).

⁴ While a CCP is also exposed to the risk of investment losses on reinvested cash collateral, the need to maintain a credible replacement cost guarantee requires that its investments are held in the form of highly liquid assets with low credit and market risk.

Regulatory Tools

Systemically important institutions create risks that are borne not just by the institutions themselves, but by the financial system and economy as a whole. It is therefore instructive to look at the regulatory tools applied to manage or mitigate these risks. The differences between banks and CCPs described above are reflected in their respective regulatory frameworks (summarised in Table 2).

- Given their importance for financial systems and the real economy, banks are subject to close supervision against a comprehensive set of internationally harmonised regulatory standards, as set out in the BCBS's Basel III framework (and previous iterations, see BCBS (2011)). These tools aim to ensure that a bank is sufficiently well capitalised that it could absorb losses, while protecting depositor funds, and that it could continue to operate in stressed market conditions.
- Systemically important CCPs are also subject to detailed supervision in accordance with international standards – in this case the standards set out in the PFMI and associated guidance. The PFMI are principles based, but wide ranging, establishing requirements in all areas of CCP design and operation. In particular, these tools aim to ensure that CCPs have appropriate financial and operational risk management processes in place, including sufficient resources to withstand potential losses. At the time of writing, work is ongoing among policymakers to establish whether some aspects of the standards should be refined to promote greater consistency in interpretation.

Table 1: Measures of Systemic Importance
Differences between systemically important CCPs and banks

Indicator	Central counterparties	Banks
Size	A CCP's balance sheet is typically much smaller than that of a bank and does not necessarily determine its systemic importance. More relevant is a CCP's central role in markets.	A bank failure would have a greater impact on financial markets, the economy and confidence if the bank was large.
Interconnectedness	A CCP is by its nature highly interconnected with financial institutions. Compared with a bank, CCPs are typically exposed to fewer counterparties; participants must also satisfy strict membership requirements. CCPs may spread distress following a default if losses exceed the margin posted by a participant and the CCP has to draw on the mutualised default fund; or, if the default fund is exhausted, the CCP has to resort to non-pre-funded loss allocation. More generally, the default management process may itself spread distress in markets.	Borrowing, lending and trading activity between banks creates interconnections that may be a source of contagion.
Substitutability	A given market is typically served by only few (often just one) CCPs, making their substitutability low. Continuity of critical clearing services is often central to participants' ability to access the underlying markets.	Banks perform key financial services for other financial institutions, businesses and households. Where a particular bank controls a large share of a given market/service provision, its failure could cause significant disruption.
Complexity	A CCP's activities are often not complex, typically focused on one product or market segment. A CCP may offer 'complex' products, although to be eligible for clearing products must typically be sufficiently liquid, standardised and subject to reliable valuation (FSB 2010).	Large banks tend to engage in activities that increase their complexity, such as trading complex products, or maintaining investments in illiquid or difficult-to-value assets. This makes them more difficult to deal with during a stress event.
Cross-jurisdictional activity	CCPs are increasingly regulated in multiple jurisdictions, but many are domestically focused. However, participants may be global banks that are connected to many CCPs.	Large banks are often active in multiple jurisdictions, creating cross-border channels of contagion.

Source: RBA

Credit, market and replacement cost risk

Regulatory tools employed under the regimes for banks and CCPs to manage and control credit, market and replacement cost risks take a number of forms.

Loss absorbency

The core of the BCBS's regulatory framework for banks is minimum capital requirements. A bank's capital allows it to absorb losses incurred on its assets without defaulting on its liabilities. For regulatory purposes, this capital consists mainly of common equity (shares and retained earnings) and certain liabilities that can be converted to equity in certain circumstances. Basel guidelines set minimum capital requirements that are proportional to a bank's risk-weighted assets, with capital expected to cover unexpected losses with a 99.9 per cent probability. Risk-weighted assets are largely determined by applying regulatory risk weights, although for those banks approved to use internal models, they are derived from modelled probabilities of default or losses given default on individual (or sets of) assets or exposures. In general, higher capital requirements apply for exposures that have a greater likelihood of defaulting, as well as those that could give rise to a greater proportional loss.⁵

In contrast, CCP regulation focuses primarily on minimising the potential for losses through collateral; the PFMI require that initial margin covers future exposures over the expected close-out period for the relevant cleared product with at least 99 per cent probability, and that exposures are marked to market at least daily. Should losses occur, the structure of a CCP allows it to absorb the losses using funds contributed by participants in conjunction with its own equity. The focus of the PFMI is therefore the total size of default resources which, for a systemically important CCP, should be sufficient to cover the default of any two participants

in extreme but plausible conditions. However, the amount of a CCP's own equity at risk ('skin in the game') and, importantly, its position in the default waterfall, does impact the incentives of both the CCP and its participants to prudently manage risk (Carter and Garner 2015).

Procyclicality

These risk controls (capital, margin etc) can be procyclical in nature. During periods of stress, banks are likely to require additional capital, constraining their ability to lend; similarly, CCPs' margin or other pre-funded resource requirements may rise, impacting participants. From 2016, banks may be subject to a countercyclical capital buffer, an additional layer of capital with the intended effect of reducing the procyclicality of capital requirements by increasing capital levels during periods of strong growth, and reducing the need to recapitalise during downturns. For CCPs, the PFMI require margins to be set in a forward-looking and conservative manner, taking into account potentially stressed market conditions and seeking to reduce cyclical fluctuations.

Supplementing the risk-based capital requirement for banks from 2018 is the leverage ratio (BCBS 2014a). This ratio is independent of the riskiness of assets and aims to constrain leverage in the banking sector by reducing the dependence on what may be subjective risk weights. An important aim is to lower the risk that an economic downturn will result in sudden deleveraging. This type of regulation is not necessary for CCPs, which do not rely on leverage in the way that banks do.

Stress testing

The robustness of a bank's or a CCP's framework for dealing with credit risk can be checked through stress testing (liquidity stress tests are also performed, see below).

Reflecting the longer-term nature of their assets, bank stress-test scenarios typically consider the impact of macroeconomic and financial shocks on

⁵ It should be noted that this includes a bank's exposures to CCPs, with the capital requirement calibrated according to the scale of the bank's trading activity and that of its clients, as well as its contributions to the default fund (BCBS 2014c).

Table 2: Regulatory Frameworks
Key elements of the frameworks for CCP and bank regulation

Element	Central counterparties	Banks
Credit, market and replacement cost risk	<p>Only exposed to credit risk if a participant defaults; exposure is for a short time – the assumed liquidation period</p> <p>Initial margin to cover 99 per cent of price changes; variation margin marks-to-market</p> <p>Default fund – sufficient to withstand the default of two participants in ‘extreme but plausible’ market conditions (i.e. Cover 2); includes CCP’s own equity (typically limited)</p> <p>Models should consider procyclicality of requirements</p> <p>No market risk</p> <p>Stress tests cover a range of forward- and backward-looking market scenarios; short horizon</p>	<p>Exposed to credit risk over long periods, since assets and collateral are often illiquid</p> <p>Collateral held against some assets; often illiquid</p> <p>Capital is largely risk based; 99.9 per cent coverage</p> <p>Leverage ratio (non-risk-weighted)</p> <p>Capital conservation buffer and counter-cyclical buffer</p> <p>Capital charge for market risk</p> <p>Stress tests are largely grounded in macroeconomic scenarios over longer horizons; standardised supervisory tests</p>
Liquidity risk	<p>Funds generally held in liquid assets – must be available in a short timeframe</p> <p>Minimum liquidity requirement, based on liquidity stress test (Cover 2 requirement)</p>	<p>Assets and collateral generally illiquid</p> <p>Liquidity coverage ratio (30-day stress test)</p> <p>Net stable funding ratio</p>
Operational risk	Detailed principles for operational risk – reliability, incident management, information security, business continuity and use of critical service providers	<p>Capital charge for operational risk</p> <p>Principles for managing operational risk</p>
Recovery ^(a)	<p>Recovery tools written into rules and intended to be comprehensive and effective to ensure continuation of service</p> <p>Recovery plans include tools to allocate unfunded losses and liquidity shortfalls to participants; tools form part of the contract with participants</p>	<p>Detailed plans and demonstrated capacity to return to viability in the event of a shock</p> <p>Recovery plans are more scenario driven</p>
Resolution ^(b)	<p>Loss-allocation in recovery intended to be comprehensive; resolution a ‘back-stop’</p> <p>Some consideration given to additional pre-funded loss absorbency in resolution</p>	Resolution plans, which include additional loss-absorbing capacity in resolution for G-SIBs
Disclosure	<p>Disclosure rules aimed at informing participants of risks and responsibilities</p> <p>Minimum quantitative disclosures; qualitative disclosures reflecting PFMI</p> <p>Allows participants to monitor risks</p>	<p>Listed companies subject to normal financial reporting requirements</p> <p>Comprehensive and detailed qualitative and quantitative regulatory disclosures</p> <p>Promotes market discipline</p>

(a) Recovery refers to the tools and plans that financial institutions have in order to return themselves to viability following a severe financial shock

(b) Where recovery tools prove unsuccessful (or cannot be used), resolution tools allow regulators to step in and manage the failure of the institution (potentially allowing some parts to continue while winding down others) in an orderly way

Source: RBA

asset values over a period of time – e.g. an economic recession in which default rates on loans increase over time in response to changes in the level of unemployment or interest rates. In contrast, CCPs are only exposed to the risk of losses over the close-out period, which is typically a matter of days. Scenarios for CCP stress tests generally involve large shifts in portfolio values over a short period – e.g. extreme price moves or sudden changes in volatility, asset correlations, and/or the shape of the yield curve.

Some regulators also use standardised supervisory stress tests for banks, independently testing their resilience against a common set of shocks. Such tests allow banks to be compared and ranked according to their capital adequacy. Some have called for cross-jurisdictional standardised regulatory stress tests for CCPs (JP Morgan Chase 2014). However, any such exercise would need to be approached carefully, given the marked differences in the product scope (e.g. exchange-traded versus OTC derivatives; single market versus multiple markets) and the operating environments of CCPs.

Liquidity risk

Banks and CCPs must also be able to deal with their liquidity risk effectively. For a bank, Basel III addresses liquidity risk with the introduction of two ratios: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) (BCBS 2013a, 2014b). The LCR ensures that banks have sufficient high-quality liquid assets in order to survive an acute one-month liquidity stress scenario, while the NSFR requires a minimum level of stable funding sources over a one-year horizon to limit banks' reliance on short-term wholesale funding that could quickly dry up in a period of market stress.

While a bank must manage the risk that arises from the liquidity mismatch between its assets and liabilities, a CCP's liquidity risk management focuses on ensuring it has the ability to cover any payment obligations at the time they are due. A CCP is exposed to liquidity risk following the default of a participant, to the extent that it relies on incoming

variation margin and other payments from the defaulted participant in order to make payments to other participants. For this reason, a CCP must ensure that it maintains sufficient qualifying liquid resources. These should be held in cash and other highly liquid and marketable securities that maintain their value in times of market stress, and could be liquidated at short notice. The relevant horizon for liquidity risk in the case of a CCP is again a period of days (i.e. until exposures arising from a participant default can be effectively hedged and then closed out). As with credit risk, stress testing is important for both banks and CCPs to confirm the robustness of liquidity risk controls (see above).

Given the funding structure of a typical bank, liquidity stress scenarios typically involve funding pressures, occurring simultaneously with falls in asset prices. Since financial resources for a CCP are pre-funded and largely stable, liquidity stress tests are driven by similar financial market scenarios to their credit stress tests, though with appropriate assumptions related to specific events such as the default of liquidity providers, and in the case of a securities CCP, the timing of settlement obligations.

Market risk

Banks face market risk on their trading assets, as well as through foreign exchange and commodity holdings. Accordingly, a capital charge is applied to this added risk in a bank's balance sheet. In contrast, a CCP maintains a matched book and is only exposed to market movements on cleared products in the event of a participant default. Cash collateral, default fund contributions and assets held for business risk purposes must be invested in assets with low credit, market and liquidity risk.

Operational risk

Operational risk is the risk of losses arising from deficiencies or failures in internal systems, policies or controls. The Basel guidelines account for operational risk using an additional capital charge, complemented by a set of *Principles for the Sound*

Management of Operational Risk (BCBS 2014d). CCPs must meet detailed standards for operational risk management, as set out in the PFMI. This reflects the central importance of uninterrupted operation of a CCP's services, and the maintenance of confidence in the ability of the CCP to perform its functions. These requirements include the capacity to resume operations within two hours following an incident.

Recovery and resolution

There is a high degree of commonality in the recovery and resolution approaches for banks and CCPs, but also some important differences. The basic objectives in both cases are the preservation of financial stability and continuity of critical functions and services, while avoiding recourse to public funds. Given the lack of substitutability of a CCP, continuity of service and the ability to continue to meet contractual obligations to participants on time are particularly prominent considerations, as is the short time horizon over which such obligations are typically due.

Recovery and resolution frameworks for banks are guided by the Financial Stability Board's (FSB) *Key Attributes of Effective Resolution Regimes* (the *Key Attributes*), published in 2011 (FSB 2011), and associated guidance on recovery planning (FSB 2013). The *Key Attributes* were reissued in 2014 with a tailored annex for application of resolution frameworks to FMIs, including CCPs (FSB 2014b), together with a guidance paper developed by CPMI and IOSCO on recovery planning for FMIs (CPMI-IOSCO 2014).

Recovery

Recovery refers to actions taken by the institution (the bank or the CCP) to restore itself to viability following a financial shock. For both a bank and a CCP, the core of recovery planning is to identify stress scenarios and develop processes and options to restore the entity to sustainable viability should they occur. Among the important areas of focus in recovery planning for banks are identification of stress scenarios, operational readiness to deal

with stress (including, for instance, by ring-fencing problem business lines, while retaining others intact), early warning indicators, escalation procedures, and the integration of recovery scenarios into the broader risk framework.

In the case of a CCP, a financial shock is less likely to be 'slow-burn' in nature, which requires a CCP to deal with a participant default quickly. It is therefore important that a CCP has clear predefined loss and liquidity allocation procedures established in its rules. The PFMI anticipate contractually agreed loss allocation to (and liquidity provision from) participants sufficient to comprehensively meet any shortfall. The CPMI-IOSCO guidance on recovery sets out five desirable characteristics of CCPs' (and other FMIs') recovery tools: comprehensiveness; effectiveness; transparency, measurability, manageability and controllability; appropriate incentive effects; and minimisation of negative impact (CPMI-IOSCO 2014).

The PFMI requirements aim to strike a balance both between defaulter-pays and mutualised protection, and between pre-funded and ex-post-funded loss allocation. The trade-off is between requiring greater pre-funded loss-absorbing capacity, which could be costly and discourage cleared market activity, versus minimising possible contagion from pushing unfunded losses back to participants. Recent modelling work using data on global OTC derivatives markets (Heath, Kelly and Manning 2015) suggested that a Cover 2 standard (i.e. sufficient pre-funded resources to withstand the default of any two participants in stressed market conditions) would enable unfunded losses to be sufficiently dispersed to minimise contagion, even in highly extreme scenarios.

Resolution

Should recovery prove unachievable, resolution would, at least in theory, be triggered. At this stage, the resolution authority would step in with the power to take a range of actions, including appointing a statutory manager, establishing a bridge institution,

and transferring the clearing business to another provider.

The different roles, risk profiles and balance sheet structures of banks and CCPs lead to significant differences in arrangements for the allocation of remaining losses in resolution. In the case of G-SIBs, the FSB has developed a regime to enhance loss-absorbing and recapitalisation capacity in resolution by establishing a minimum requirement for financial instruments that may be used to absorb losses – so-called total loss-absorbing capacity (TLAC) (FSB 2014a, 2015b).⁶ In accordance with the Key Attributes, a G-SIB's resolution authority should have the 'power to write down and convert into equity all or parts of the firm's secured and unsecured liabilities'. Alternatively, the conversion to equity could be applied in the contracts underpinning debt instruments.

Since a CCP is required to establish comprehensive loss allocation arrangements in its rules, resolution should in theory never be necessary (Gibson 2013). Nevertheless, a special resolution regime in accordance with the Key Attributes is an important back-stop should a CCP be unable to fully execute its recovery plan, or should public intervention be desirable on stability grounds. The starting point for a resolution authority would be expected to be the CCP's own recovery plan.

There is an emerging debate at the time of writing as to whether additional forms of pre-funded loss absorbency should be available to a CCP's resolution authority, in the spirit of TLAC. Given the balance sheet structure of a CCP, it is likely that the only remaining pre-funded liability at the point of entry into resolution would be non-defaulted participants' initial margin. Where it was not bankruptcy remote, haircutting initial margin would be consistent with the counterfactual of general insolvency.

Otherwise, generating additional pre-funded resources would necessitate seeking additional *ex ante* commitments – most likely from participants

– in the form of a resolution fund (Coeuré 2015). In establishing such a fund, close consideration would need to be given to potential adverse incentive effects, both *ex ante* (since it would increase the cost of submitting trades to clearing) and *ex post* (since the availability of such a fund could have implications for participants' commitment to the CCP's default management and recovery processes). An alternative might involve temporary public funding, to be recovered from participants over time.

Disclosure, governance and transparency

Proper transparency and disclosure is important in order to promote discipline, by giving stakeholders the information required to properly assess the risk of institutions. For banks, the third pillar of the Basel framework details the qualitative and quantitative disclosure requirements for banks, including an extensive and detailed set of data covering a range of risk metrics.

As noted, there is a strong interdependence between CCPs and their participants, who bring risk to the CCP but also bear that risk through mutualisation. Accordingly, such risks should be transparent to participants, and participants should exert a measure of control over them (Kroszner 2006). Governance and transparency are both dealt with in the PFMI, which require that a CCP's 'major decisions reflect appropriately the legitimate interests of its direct and indirect participants'. In practice, many CCPs have participant risk committees and other advisory committees that directly influence key risk policy decisions. Quantitative and qualitative disclosures are also required.

Conclusion

This paper has highlighted some of the key differences between banks and CCPs, demonstrating how these give rise to different channels for transmission of systemic risk and in turn demand different regulatory approaches. At the time of writing, work is ongoing to appraise the level of resilience achieved by CCPs

⁶ For more information on the TLAC requirements for G-SIBs, see Smith and Tan (2015).

under the PFMI. Experiences from bank regulation may be useful inputs to this debate.

At the same time, however, any refinements to the existing standards for CCPs should continue to reflect important differences between banks and CCPs. For example, banks are exposed to credit risk over long periods, with illiquid assets that can create funding risks; CCPs, by contrast, are largely pre-funded and are exposed to credit and liquidity risk only for a short period following the default of a participant. Similarly, while the size, breadth and complexity of a bank's activities can make it systemically important (domestically and globally), a CCP's systemic importance is largely derived from its role in a specific market (often lacking substitutability) and the important interdependencies it has with its participants.

As discussed, a CCP is not likely to run into difficulties without one or more of its participants failing to meet their obligations, so bank-CCP interactions in a crisis are obviously important. There is more work to be done on the interaction between banks and CCPs. One prominent issue is common participation across CCPs internationally, which means that a large bank failure could impact multiple CCPs. ↗

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