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Design Choices in Central Clearing: Issues Facing Small Advanced Economies

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NON-TECHNICAL SUMMARY

Financial derivatives, traded between financial institutions, and between financial institutions and their customers, make up a significant volume of the activity in the financial system. These instruments play a valuable part in managing risk. The 2008/09 financial crisis highlighted the scale of the problems with, and uncertainties around, these instruments, especially when financial institutions can fail and market liquidity can fall away sharply. In the wake of the crisis there has been a strong push, initiated by G20 leaders, towards the central clearing of standardised derivative contracts through central counterparties. Under such a model, the two parties doing the initial deal no longer have a direct exposure to each other; rather both are exposed to a central counterparty or CCP, which interposes itself between the two initiating parties.

For some contracts traded between some institutions, such central clearing is becoming mandatory. Regulatory incentives are also being altered to encourage the use of CCPs where reasonably possible, and to ensure that where central clearing is not appropriate capital is held against the risks that arise. In this paper, we review some of the issues involved in deciding which transactions should be centrally cleared, where CCPs should be located, and how they should be designed, managed, and regulated. As derivatives reform progresses, the soundness of the central counterparties becomes more important to the soundness of the financial system, so these questions are important.

The issues around CCPs are complex enough in a single country. The difficulties multiply once one takes account of the scale of cross-border financial trading, the operation of large financial institutions in multiple jurisdictions, and the potential for inconsistencies and conflicts between regulatory regimes.

New Zealand is not part of the G20 and, while it has attempted to encourage central clearing through incentives in its bank capital requirements, it has not taken steps to mandate the use of CCPs. However, overseas legislation already impinges on the activity of the larger New Zealand banks, their Australian parents, and on the pricing of OTC derivatives. For instance, Australian regulators have recommended mandating central clearing by internationally active Australian banks of interest rate derivatives denominated in five currencies, and this will affect markets in New Zealand.

The first half of the paper reviews some of the issues around central clearing for a small advanced country with little or no direct influence on the international responses to the

derivatives reform agenda. New Zealand is one such country, and the continued functioning of derivatives markets plays a significant role in the ongoing soundness and efficiency of its financial system. How it is best to engage with the global reform agenda is therefore salient. The authors explore the implications of a range of options for this engagement, teasing out some of the pros and cons of each of the alternatives. Neither they, nor the Reserve Bank as prudential regulator, has taken a view on how best to weigh the conflicting considerations, or on the preferred longer-term approach for New Zealand.

1 INTRODUCTION

In September 2009, in the immediate aftermath to the financial crisis, the leaders of the G20 nations committed, amongst other things, that¹

“All standardised OTC derivative contracts should be ... cleared through central counterparties”

We focus on the resulting over-the-counter (OTC) derivatives reform and its implications. These implications – for financial stability, market structure, and for the firms involved in this market – continue to be substantial. The result of the reforms enacted or proposed to meet the G20 policy undertaking has been a significant shift in risks, costs, and liquidity. Although the impact has been keenly felt by the banks and the other intermediaries who conduct the majority of derivatives trading, it has also affected market infrastructure providers, derivatives end-users, funding providers, and others.

The policy consequences have been as profound as the commercial ramifications. A plethora of international and national regulations have emerged to meet the commitment imbued in the short extract above. However, this set of regulations has been imperfectly coordinated: many of the national laws overlap rather than interlock, creating a contested landscape. This has resulted in foreign laws intervening directly and substantively in domestic markets.²

New Zealand is not a member of the G20, yet it has a globally interconnected derivatives market which plays an important role in local banks' funding and risk management arrangements. The new regulatory landscape therefore has a significant impact on New Zealand's financial institutions. It also creates supervisory and market infrastructure choices: how should a small, financially sophisticated country like New Zealand respond to the international agenda? For now, the Reserve Bank has not sought to impose central clearing requirements on New Zealand banks.³

¹ See G20 (2009).

² For example, five Australian banks have registered as “Swap Dealers” with the U.S. Commodity Futures Trading Commission, in response to US regulation.

³ “*The Reserve Bank does not currently consider that specific central clearing mandates are necessary for New Zealand banks, given the significant increase in voluntary clearing activity due to, among other things, the capital incentives introduced in the implementation of Basel III.*” Reserve Bank of New Zealand: Financial Stability Report, November 2014, page 56.

The G20 commitments cover a range of measures. We will focus on the requirement to clear certain OTC derivatives at central counterparties (CCPs). How in particular should a country like New Zealand respond to this policy initiative? In discussing this question, we assume some familiarity with derivative instruments and central clearing: see Murphy (2013) or Nosal & Steigerwald (2010) for more details, and refer to box 1 for a summary of the relevant terminology.

We will set out some of the choices available in designing OTC derivatives policy and their principal consequences. Our aim is not to articulate optimal policy, but rather to examine the gamut of choices for how clearing is organized and regulated in order to provide a map of possible policies.

Many of the 'standard' responses to the reform agenda arose from pre-existing (pre-crisis) arrangements, so counterfactual arguments may help shed light on alternatives. What if we had started with many local CCPs or a single global CCP, for instance, rather than having OTC derivatives clearing concentrated in a handful of global clearing houses?⁴

There are design questions that remain live within the policy debate, too. The requirement to use clearing houses for certain products is a good example: should there be many or few – or none at all – of these 'mandated' products? Each design choice has consequences, and no one size fits all. Thus it may be that different countries rationally and properly take different decisions in the pursuit of the same broad policy desiderata. We begin by examining the context of these choices for a small advanced country like New Zealand. In sections 3-5, various aspects of the local policy question are examined, including the desired OTC derivatives market structure, and the optimal scope of a clearing mandate for a small advanced economy. Sections 6-8 then turn to more general questions including the structure of CCP financial resources, CCP organization, and the relationship between exchanges and CCPs. Section 9 offers some tentative conclusions.

⁴ This question is addressed in more detail in Duffie and Zhu (2011).

A Short Introduction to OTC Derivatives Clearing Terminology

A **central counterparty** (CCP) is an entity which facilitates the **clearing** of financial transactions by interposing itself into every trade it clears through a process known as **novation**. This discharges the original contract and replaces it with two new trades: the buyer buys from the CCP, and the seller sells to it. Neither buyer nor seller is exposed to each other's performance of their leg of the transaction after this process.

CCPs exist in derivatives, securities and repo markets. However, due to the longer time horizon of derivatives transactions compared to securities settlements or the typical repo, and the delicate task of assessing the risk inherent in a derivatives portfolio, clearing in the derivatives markets can be a more complicated than clearing in other areas.

Note that because novation creates two offsetting contracts, as long as both buyer and seller perform, the CCP bears no market risk. On the other hand, novation places the CCP in the centre of the web of exposures: it has counterparty risk to every party which faces it.

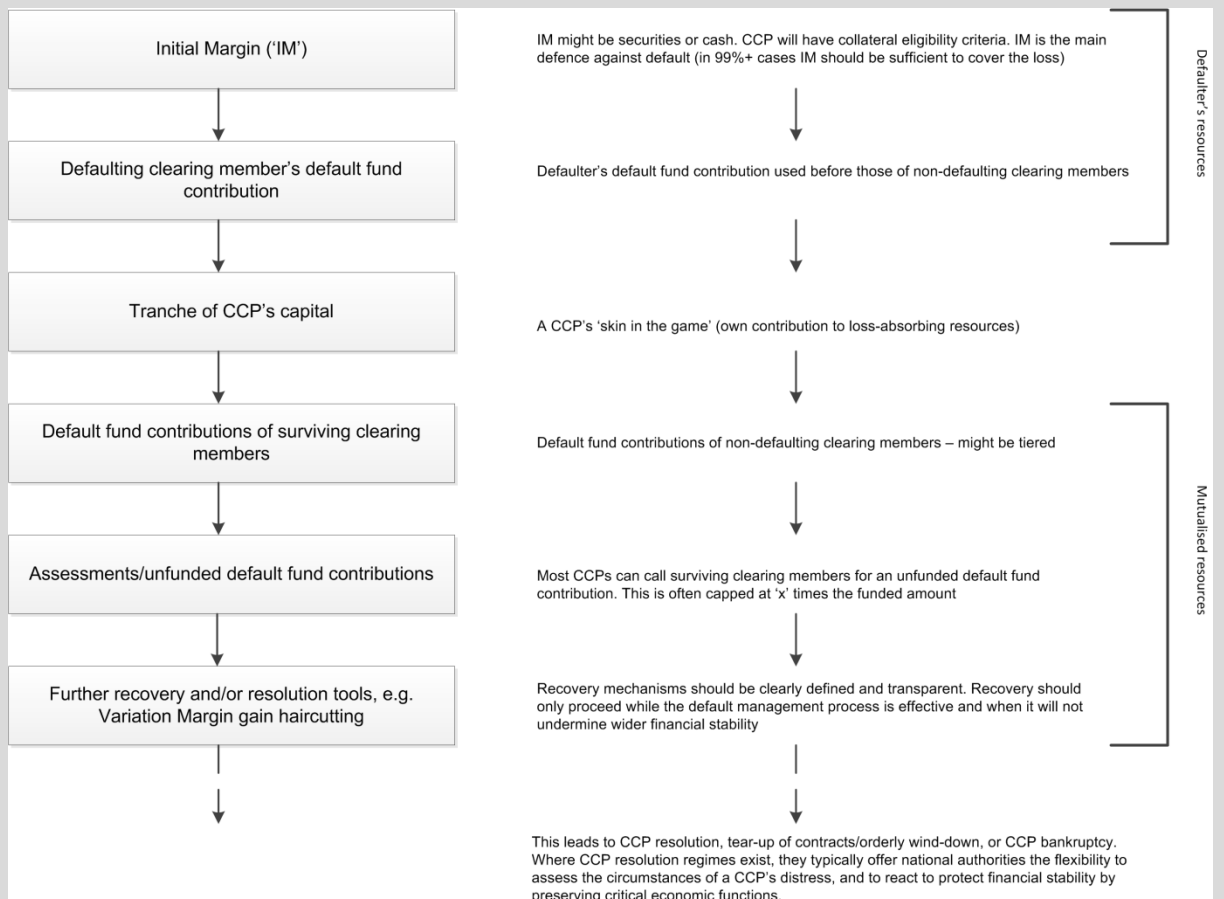
The CCP uses three basic techniques to mitigate this counterparty credit risk: (1) restriction of transactions to **clearing members** (CMs) who meet certain minimum requirements; (2) margin requirements; and (3) a loss mutualisation or **default fund** that CMs must contribute to.

All the defences are important, with margin requirements playing a particular role. Each counterparty is required to post both **variation margin** and **initial margin**. These are available to the CCP to absorb losses should that particular counterparty default. Initial margin is required to enter into the trade at the outset and is determined by a model created by the CCP based on the risk of the counterparty's portfolio of cleared derivatives. Variation margin is the mark-to-market profit or loss on the cleared portfolio. As the value and risk of the portfolio changes, initial and variation margin requirements are adjusted. Typically margin is called or returned by the CCP at least daily.

The structure of techniques (2) and (3) along with other financial resources, such as a CCP's own equity, is often referred to as the CCP's **default waterfall**: Figure 1 illustrates this.

The default fund is a mutualised resource which is available to absorb default losses should they exceed the defaulter's margin. All CMs are required to contribute amounts to this common fund. The default fund highlights the **self-insurance** function of the CCP. The CCP internalises some of the risk that would otherwise exist in the OTC derivatives market, isolating it into one entity.

Figure 1: A typical CCP default waterfall structure



The CCP reduces overall systemic risk by **netting** all the positions in a participant's cleared portfolio. Thus if A trades with B and C, and clears all of its trades at a CCP, the CCP only has exposure to A's net portfolio, whereas before clearing both B and C would have had exposure to their trades with A separately. The **multilateral netting** function plays a crucial role in the reduction of overall systemic risk by lowering the total risk of cleared obligations parties have to one another in the financial system.

A key aspect of multilateral netting is **default management**. If a clearing member defaults, the CCP's own position is no longer "risk flat". The CCP uses the resources available – the defaulter's margin and default fund contributions, and if necessary the rest of the default

waterfall – to return to a flat position. Typically either the default's position is auctioned outright, or the CCP first hedges the position then liquidates it.

A CCP will clear transactions only with its members. Membership is restricted to parties who are sufficiently well-capitalized that they pose an acceptable risk to the CCP and to the other members, and who moreover can meet the CCP's operational requirements. Some parties may not be able, or may not wish to, become a member of the CCP. These **clients** can access clearing through one or more clearing members. There are two models here: either the client faces the clearing member as **principal**, and the clearing member enters into a mirror trade with the CCP, or the clearing member acts as **agent**, guaranteeing the client's performance to the CCP.

CCPs sometimes interact with each other, rather than just with market participants. **Interoperability** involves one CCP establishing a link with another, so that a user of one CCP can execute a trade with a counterparty that uses the second CCP. This enables market participants to select the best CCP for their needs, while giving them access to trading partners who have made a different choice. The use of the link means that the original trade is novated into three contracts: buyer to buyer's CCP, buyer's CCP to seller's CCP, and seller's CCP to seller. Interoperating CCPs assume credit exposure to each other as well as to the buyer or seller, and this is mitigated with margin (and perhaps other resources).

2 THE CONTEXT FOR OTC DERIVATIVES REFORM IN COUNTRIES LIKE NEW ZEALAND

Countries like New Zealand which have not yet implemented the G20 OTC derivatives reform commitments have to decide, actively or passively, how to respond to the global agenda. There are three key decisions:

Choice 1: How should countries like New Zealand align to the G20 commitments?

Choice 2: What structure should entities in such countries use for OTC derivatives clearing?

Choice 3: Should such countries require mandatory clearing of certain OTC derivatives by certain parties? If so, which products and which parties?

We examine each of these three choices in the next section. First, though, there are a number of important pieces of context for these decisions:

- Many central clearing design decisions have already been taken: these are exemplified in the existing global CCPs. A country cannot wish into being a new global CCP; it either has to use what exists, or create something new (with all of the costs that entails);
- A number of OTC derivatives clearing policy frameworks, including those of the United States and the European Union, have already been set out. These regimes often contain a methodology for determining if another country's response is 'equivalent'. Therefore some design decisions a country might make will impact this equivalence determination.
- The various policy choices will have different impacts on the stability of a country's financial system.
- The financial system will adapt to external forces imposed, so the policies a country enacts will influence the future direction of its financial system. The costs and benefits of potential adaptations may therefore shape preferences too.
- Finally, there are subtle interactions between a country's policy decisions and its existing legal and regulatory frameworks such as bankruptcy law.

These factors make any OTC derivatives reform decision complex. In this section and sections 3-5, we discuss these decisions in more detail. At the outset, though, it is useful to discuss the international policy context.

2.1 INTERNATIONAL CONTEXT

The jurisdictions with the largest OTC derivatives markets, namely the US, the EU, and Japan, are well advanced in implementing OTC derivatives regulatory reforms.⁵ This is unsurprising as these jurisdictions represent the largest economies and the largest derivatives markets in the world. However, sufficient OTC derivatives are traded elsewhere for them to be important to the functioning of many countries' financial systems so the reform agenda is pertinent beyond the largest markets.

Pre-crisis, most bilateral OTC derivatives were traded under private arrangements governed under New York law or the law of England and Wales.⁶ Post reform, private contractual terms continue to be important in many contexts, but now with added nuances created by additional regulation. Two important bodies of regulation here are the United States' Dodd Frank Act (and the accompanying regulations from the various US agencies), and the European Union regulation known as EMIR.⁷

These rules already affect New Zealand. For instance, the New Zealand Stock Exchange (NZX)'s derivatives clearing business is impacted by EMIR.⁸ This regulation requires that non-EU CCPs are recognised by the European Securities and Markets Authority (ESMA), where they provide clearing services to EU clearing members or trading venues. This recognition will be necessary for European counterparties to treat these 'third country' CCPs similarly to EU CCPs. NZX's CCP "NZ Clearing Limited" currently does provide such services to a clearing member established in the EU, and so it has applied for recognition. However, a condition here is that the European Commission, based on technical advice from ESMA, determines that the regulatory regime for CCPs in the jurisdiction of the applicant is equivalent to that in the EU under EMIR. European Authorities have been asked to opine on this in respect of a number of jurisdictions and, at the time of writing, some regimes have

⁵ See Financial Stability Board (2014) for a review of progress here.

⁶ For more on private law, see Braithwaite (2011).

⁷ EMIR stands for the 'European Market Infrastructure Regulation'. This was the working title of the regulation now formally titled *Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories*. The text of this regulation is available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012R0648>

⁸ Under Article 25 of EMIR, a third country CCP must obtain recognition from the European Securities and Markets Authority (ESMA) in order to be treated equivalently to European CCPs: without this recognition, higher capital requirements apply for European entities exposed to this CCP, and trades cleared at it do not satisfy the European clearing mandate. An important criterion for granting such recognition is that the European Commission has determined 'equivalence' in respect of the legal and supervisory framework of the third country.

been deemed unconditionally equivalent, paving the way for their CCPs to become recognised without further action.⁹

The challenge is moreover not necessarily just one of alignment to a single foreign regime. For instance, it is plausible that large New Zealand banks could become close to the Dodd-Frank threshold for Swap Dealer registration in the US and hence have to apply to the CFTC for registration under its requirements.¹⁰

The April 2012 CPSS-IOSCO *Principles for Financial Market Infrastructures* (PFMIs)¹¹ form an internationally agreed common core to both EMIR and the relevant US regulations. Like many other countries, New Zealand has not yet implemented its own version of the PFMIs for CCPs. Accordingly, it may be problematic for the New Zealand regime to be deemed unconditionally equivalent to other PFMI-based regimes. We can clearly see, then, that foreign policies impinge on New Zealand's OTC derivatives market, and may constrain the policy options for it.

A further international issue is that New Zealand derivatives market participants will be affected by foreign clearing reforms due to the latter's impact on the counterparties of NZ entities. Many counterparties will be subject to foreign clearing mandate(s), and indeed a New Zealand bank trading a mandated derivative with a US counterparty may already be required to clear that trade through a US-regulated CCP.¹² This, combined with the commercial and regulatory incentives to clear,¹³ means that international reforms are already affecting NZ markets.

⁹ As of November 2014, the Commission has agreed that Australia, Hong Kong, Japan and Singapore have regimes which are equivalent to EMIR: http://ec.europa.eu/finance/financial-markets/derivatives/index_en.htm.

¹⁰ Under Dodd-Frank, any US-regulated firm that participates in the OTC derivatives market and trades more than \$8 billion of notional value has to register as a Swap Dealer. In 2012, the CFTC said it will conduct a study of the market after it begins to collect data from swap data repositories and will then consider whether the limit should be changed. The threshold would automatically be lowered—likely to \$3 billion—after five years (i.e., in 2017) if the CFTC does not act before that time.

¹¹ See CPMI and IOSCO (2012).

¹² Under the Dodd-Frank Act, the CFTC has introduced clearing mandates for some OTC derivatives products: see for instance CFTC (2014). Any US counterparty to a mandated trade will need to ensure that the trade is cleared using a US registered CCP or a deemed-compliant foreign CCP.

¹³ These include the capital charge for CVA risk, the lower risk weight for exposures to CCPs in Basel III, and compulsory margin requirements for many bilateral OTC derivatives transactions: see *inter alia* Basel Committee on Banking Supervision *Margin Requirements for non-centrally cleared derivatives* (BCBS 261), *Capital treatment of bank exposures to central counterparties* (BCBS 253 & 282) and *Basel III: A global regulatory framework for more resilient banks and banking systems - revised version* (BCBS 189) available at www.bis.org/bcbs.

2.2 TRANS-TASMAN CONTEXT

Australia's OTC derivatives reforms are of particular significance to New Zealand due to:

- The fact that the largest four banks in New Zealand are Australian owned; and
- The commitment of both countries to create a seamless trans-Tasman business environment via a formal Single Economic Market agreement. Moreover,
- Australia's extant OTC derivatives reforms have a significant impact on NZ-domiciled entities.¹⁴

The history in short here begins with the Australian Securities and Investments Commission's (ASIC) implementation of a requirement to report OTC derivatives trades to a central trade repository. This was followed, in July 2013, by a recommendation for a central clearing mandate for certain G4 OTC derivatives. In April 2014 the authorities recommended extending this to AUD-denominated interest rate swaps,¹⁵ and a mandate for clearing NZD-denominated interest rate swaps may be imposed in future. At the time of writing, an Australian CCP, ASX Clear (Futures) (ASX), and a leading international OTC derivatives CCP, LCH.Clearnet Ltd (LCH), have both been authorised to provide OTC interest rate swap clearing in Australia, so at least two clearing venues are available to clear AUD-denominated interest rate swaps.

Until recently, Australian banks were clearing AUD-denominated interest rate swaps via LCH's Swapclear service as clients of large international banks rather than as clearing members themselves. This choice had two principal motivations:

- The constraints of the Australian regulatory framework; and
- The desire to avoid the default management requirements associated with being a direct clearing member at a global CCP such as LCH.

The latter issue relates to requirements and/or incentives for direct clearing members to bid on the whole portfolio of any defaulter. Historically direct clearing members faced

¹⁴ For example, Australia has a detailed OTC derivative reporting mandate and a new licensing regime for trade repositories. This reporting mandate captured NZ banks from April 2014. Consequently, NZ banks need to obtain consent from their NZ clients for this reporting. The Australian authorities have also recommended a central clearing mandate for certain 'G4' currency (USD, GBP, JPY and EUR) OTC derivatives and are considering extending this to AUD- and NZD- denominated interest rate swaps. An Australian clearing mandate may well capture NZ banks in the same manner as the reporting mandate.

¹⁵ The Australian banking industry has broadly welcomed this, not least because it provides a local regime which could achieve substituted compliance.

substantial incentives to bid on any defaulter's portfolio. However, such portfolios may have significant exposure in many currencies, and thus be outside the risk tolerance of some banks, especially those without access to sufficient liquidity in *all* the major interest rate swap currencies.

In July 2013, LCH had its Australian clearing and settlement facility licence extended by the Australian Government so that it can offer its OTC interest rate swap clearing service directly to Australian banks. In addition, LCH made some changes to its default management approach such that little of the SwapClear default fund contribution of a participant with a small position in a currency is used to offset losses arising from the currency until contribution of other participants with bigger positions are completely exhausted.¹⁶ These changes mean that many of the main obstacles preventing Australian banks from becoming direct clearing members of LCH have fallen away, and all four major Australian banks are now actively clearing as members.

2.3 MARKET STRUCTURE CONTEXT

Direct clearing members of global OTC derivatives CCPs are typically very large banks, or their affiliates. Large financial services groups will have one (or several¹⁷) entities which are CCP clearing members, with other group companies clearing through that entity. The group's clients in cleared OTC derivatives either face the clearing member, in the case of the EU principal-to-principal clearing model, or are guaranteed by it in the case of the US agency model.¹⁸ For bilateral OTC derivatives, clients will face a clearing member or an affiliate of it. Historically NZ banks participated in OTC derivatives markets, trading directly amongst themselves and with international dealers, as Figure 2 illustrates.

The foreign law aspect of the OTC derivatives reforms becomes important when we consider the location of a CCP clearing NZD-denominated OTC derivatives. The RBNZ has proposed new oversight powers that would apply to systemically important financial market infrastructure (FMIs).¹⁹ *Prima facie* it appears that at least some of the largest OTC

¹⁶ See RBA's assessment of SwapClear service: www.rba.gov.au/payments-system/clearing-settlement/assessments/lch/. It is perhaps of interest here that currency-based default management is not the only possible response to concerns about banks having to default-manage all currencies.

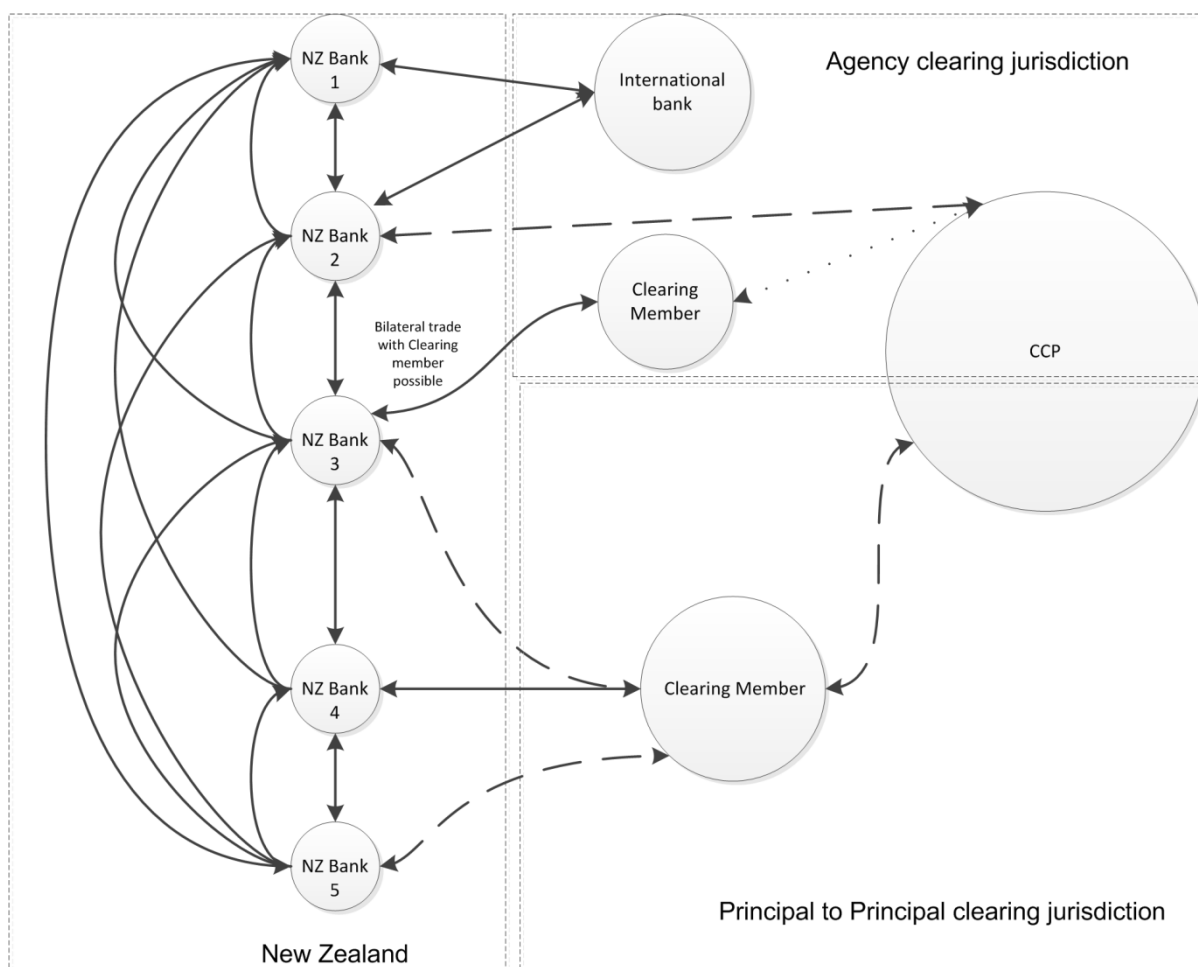
¹⁷ Clearing members of CCPs who clear for US customers must be a type of entity known as a futures commission merchant ('FCM'). EU clearing members are often broker-dealers. A large banking group may have an FCM which clears for US customers and an EU-domiciled entity to clear for non-US customers.

¹⁸ In more complex cases, the client may face another group entity, who then 'back-to-backs' the trade to the clearing member. For more on client clearing models, see Renas et al. (2012).

¹⁹ See RBNZ (2013).

derivatives CCPs are such FMIs, and therefore entities to which new powers would apply. Under the proposed framework the joint regulators (RBNZ and the New Zealand Financial Markets Authority) would have powers to obtain information, impose standards and exercise emergency powers over such CCPs. A difficulty is that international CCPs currently do not have any physical presence in New Zealand or direct connection to NZ banks, and hence any application of local powers may be contestable. We discuss this issue of ‘supervisory nexus’ next.

Figure 2: The structure of the current OTC derivatives system in New Zealand



KEY

- Uncleared derivatives trades – solid lines
- Cleared derivatives trades – dashed lines
- Guarantee – dotted line

2.4 SUPERVISORY NEXUS

The term ‘supervisory nexus’ refers to the authority that a supervisor has over an entity, if any. The most common form of supervisory nexus is one granted by statute. Thus for

instance the Reserve Bank of New Zealand Act 1989 gives the Reserve Bank the powers to register and supervise New Zealand banks.

The creation of a supervisory nexus by a law granting powers to national supervisors does not always address the concerns of all potentially interested regulators. This is the case for many pieces of global infrastructure, where the supervisors of various countries may wish to establish a nexus over an off-shore entity.²⁰

One solution to this is a ‘cooperative oversight arrangement’. Here a group of supervisors, typically led by the relevant national supervisor of an entity, agree to assist each other in pursuing their mandated responsibilities.

A good example of this is CLS. CLS is a US bank that plays an important role in settling transactions in the global foreign exchange market. It is lead-regulated by the Federal Reserve, but such is its importance internationally that a number of authorities from various countries have come together in a cooperative oversight arrangement. The agreement setting out this arrangement states in part²¹ that

“the participating central banks have established this cooperative oversight arrangement for CLS to provide a mechanism for mutual assistance in carrying out their individual responsibilities in pursuit of their shared public policy objectives for the safety and efficiency of payment and settlement systems and their focus on the stability of the financial system. In particular, the participating central banks seek to promote a consistent oversight approach that:

- A. Achieves comprehensive oversight of the overall CLS system;
- B. Enhances oversight efficiency by minimizing burden on CLS and the duplication of effort by the participating central banks;
- C. Fosters consistent and transparent central bank communications with CLS;
- D. Fosters transparency among the participating central banks regarding the development and implementation of applicable policies; and
- E. Supports fully informed judgments when participating central banks make their independent yet interdependent oversight assessments and decisions vis-à-vis CLS”.

²⁰ The Australian authorities’ position on supervisory nexus for FMIs is discussed in CFR (2012).

²¹ The full text of the arrangement is available at www.federalreserve.gov/paymentsystems/cls_protocol.htm

Cooperative oversight arrangements are common for large global FMIs.

The European Union's EMIR defines a related type of arrangement. An EMIR 'college' consists "not only of the competent authorities supervising the CCP but also of the supervisors of the entities on which the operations of that CCP might have an impact". It has a key role in the authorisation, review and on-going evaluation of European CCPs.

Some form of cooperative supervision arrangement might offer a national supervisor an acceptable supervisory nexus over off-shore infrastructure. In this case, there may be no need to mandate the use of a local entity. However, such arrangements often offer the participants less control than they would have over an entity that they directly supervise²², and less insight into the entity's stability, so the decision to accept the nexus created by a cooperative supervision arrangement is a delicate one. Thus we have:

Choice 4: How should authorities in a small advanced country like New Zealand establish a supervisory nexus over systemically important offshore financial market infrastructures?

3 GENERAL CONSIDERATIONS FOR A SMALL COUNTRY RESPONDING TO THE OTC DERIVATIVES

REFORM AGENDA

With this context in place, we now work through the sorts of issues a country like New Zealand faces in responding to the G20 OTC derivatives reform agenda. Each of the three key choices from the previous section is discussed in more detail in this section and the next two.

A more detailed version of the first choice was:

Choice 1a: Should a country like New Zealand align to G20 commitments in a 'standard' or a 'customised' way; explain why its 'customised' approach generates equivalent outcomes; or do something else entirely (including not making policy at all)?

²² In particular, typically there is a single resolution authority for a particular entity. There may be arrangements for that authority to cooperate, for instance via a crisis management group, but ultimately the resolution is controlled by the responsible authority not the group.

3.1 FINANCIAL STABILITY IMPLICATIONS

The financial stability implications of the ‘CCP prescription’²³ are a key factor in the design of OTC derivatives reform policy. The central clearing of OTC derivatives was introduced to reduce counterparty credit risk, and subsequently mandated in the largest economies to enhance financial stability. As we outlined earlier, its key benefits include multilateral netting and centralised default management. Efficient and prudent margining is important too, although this can also be delivered in the bilateral market.²⁴

Multilateral netting benefits are greatest for entities with many counterparties on clearable trades who become direct members of a CCP. The benefit is less pronounced for those who do not have a preponderance of cleared trades²⁵ and/or who access the CCP indirectly. In particular, if a bank accesses the OTC derivatives markets through one or two brokers, then simply clearing trades as clients of the same parties will not provide substantial netting benefits. This may well be the situation for many small country banks. Therefore the balance between clearable and non-clearable trades, the structure by which central clearing is accessed, and the profile of counterparty credit risk across a country’s banks will be key determinants of the financial stability benefits central clearing can deliver.

The effectiveness of centralised default management depends on the nature of the market. If a typical defaulter’s position is small compared to the total market, then default management is more likely to be effective. However, many small countries have relatively concentrated OTC derivatives markets: this is the case for New Zealand. CCPs attempt to address this issue in part through additional (‘concentration’) margin, but this increases costs and still does not guarantee that a concentrated position can be successfully liquidated in stressed conditions. Moreover, a local bank supervisor may, as we discuss above, have limited supervisory nexus over a global CCP or clearing member, and thus limited influence over the default management process compared with onshore, bilateral default management. There is also less transparency of the default management process for indirect participants than for direct clearing members.

²³ ‘CCP prescription’ is a shorthand phrase for the various post crisis policy proposals to extend central clearing in the OTC derivatives markets due to Braithwaite (2011).

²⁴ See the Basel Committee’s *Margin Requirements for non-centrally cleared derivatives* (BCBS 261) for the current regulatory proposals here.

²⁵ As RBNZ (2012) reports, “New Zealand banks obtain a significant portion of their funding from offshore, in a variety of foreign currencies. The exchange rate risk created by this borrowing is routinely eliminated by swapping foreign currency back into New Zealand dollars via the cross-currency basis swap market.” The cross-currency swaps that arise in this process form a significant part of New Zealand’s OTC derivatives market and are not yet clearable.

The existence of these issues suggests that small countries should analyse the costs and financial stability benefits of various central clearing models before taking a policy position.

3.2 EQUIVALENCE

Another key problem with Choice 1a is equivalence. As discussed in the last section, a response that is too different from that of the EU or the US risks being judged not equivalent. Both EU and US OTC derivatives reform programmes are extensive, so creating an equivalent regime involves substantial policy development. The pros and cons of this are set out in Figure 3.

Figure 3: The pros and cons for authorities of various paradigms for alignment to the G20 commitments

| | <i>Fully equivalent OTC derivatives reform framework</i> | <i>Customised, partially equivalent framework</i> | <i>No framework</i> |
|------------|--|---|---|
| <i>Pro</i> | Allows development of local infrastructure which can be deemed equivalent to international standards | Framework can be fined tuned to local needs | No policy making required, low local infrastructure cost if global infrastructure is used instead |
| <i>Con</i> | Substantial policy making effort and costs for local entities | May not be equivalent to international standards | Very high costs for international banks dealing with local parties under a non-equivalent regime |

3.3 USING OFFSHORE REGIMES

The 'no framework' option above should also be considered in the light of Australia's regulatory framework. This has already been developed in detail, and Australian supervisors and entities have made a considerable investment in supporting it. New Zealand could rely on this framework and other international policies, and desist from making its own policy. Figure 4 sets out some of the pros and cons of this approach.

Figure 4: The pros and cons for a small country of relying on foreign OTC derivatives clearing regimes

| <i>Pro</i> | <i>Con</i> |
|---|--|
| Foreign frameworks already exist. Reduced direct costs of policy making. | Where small country participants are directly subject to overseas regulators' requirements, differences in market structure and conditions may result in conflicts of law, inconsistencies, and legal uncertainty for small country entities. It will be difficult for foreign regulators to foresee or mitigate these problems. |

| | |
|---|---|
| <p>Issues around CCP failure are likely to principally be borne offshore and not likely to be caused by idiosyncratic stresses in NZ.</p> | <p>Potentially small supervisory nexus for the small country.</p> <p>In the absence of a direct relationship with an offshore CCP clearing for local banks and local currency products, the local central bank might face information problems in deciding whether to extend local currency liquidity to a global CCP and operational problems in actually extending it, for example if CCP does not have an account at the central bank.²⁶</p> <p>Depending on the precise contractual relationship, CCP rules may still result in losses being allocated to local parties even if they are not direct clearing members. In a severe crisis this allocation could have significant consequences for the stability of the local banks.</p> |
|---|---|

3.4 COSTS FOR SMALL COUNTRY BANKS AND THEIR CLIENTS

A key motivation for the G20 commitment was the reduction of systemic risk. The policy of mandating central clearing for standardised derivatives traded between financial institutions is a response to this. The central clearing of trades conducted by clients who are not systemic is less clearly required. Moreover central clearing increases the costs of using derivatives compared to the pre-crisis OTC bilateral market (ignoring, of course, the implicit cost of any externalities created).

Increased costs that systemic financial institutions face are likely to be passed on to their clients. Accordingly, as clients, small country users of OTC derivatives will face a choice.

Choice 5: Should small country clients hedge using tailored (and hence uncleared) derivatives; enter into a standardised and clearable derivative hedge; or opt not to hedge using derivatives at all?

Figure 5 sets out some of the implications of this choice.

Figure 5: The pros and cons of various choices for small country clients

| | <i>Pro</i> | <i>Con</i> |
|---|---|--|
| <i>Hedge using tailored uncleared derivatives</i> | Matches actual risk; hedge accounting treatment available | Higher cost (in regulatory capital, increased margin and/or as a result of smaller netting sets) |
| <i>Trade a standardised</i> | Cheaper than the | Exposure to more risk (due to the difference |

²⁶ By way of context, the Bank of England's statement on the provision of liquidity to CCPs can be found here: www.bankofengland.co.uk/financialstability/Documents/fmi/fmisupervision.pdf. This sets out the Bank's policy of ensuring that "there are no technical obstacles in the way of their providing liquidity to a solvent and viable CCP at short notice".

| | | |
|---|-----------------------------------|--|
| <i>and clearable derivative</i> | uncleared derivative | between the actual risk and standardised product), with potential loss of hedge accounting treatment; requirement to put in place arrangements for the funding of margin; higher cost than pre-crisis bilateral hedging |
| <i>Opt not to hedge via derivatives</i> | Cheapest upfront costs for client | Even more non-core risks assumed by the client, with increased earnings volatility as a result; market risks not managed by the party best able to bear them; possible reduced product offering as their risks cannot now be well-hedged; end users may choose different, less flexible and/or more expensive funding mechanisms |

This issue is an important one in that New Zealand derivatives end users will necessarily bear the costs of any reform (and indeed are already being affected by off-shore reforms). The impact of policy changes on these ‘real economy’ end users must therefore be carefully considered in any reform process.

4 MARKET STRUCTURE CONSIDERATIONS FOR A SMALL COUNTRY RESPONDING TO THE OTC DERIVATIVES REFORM AGENDA

We next consider the clearing structures potentially available to a small advanced country. This gives us a more detailed version of choice 2:

Choice 2a: Should OTC derivatives clearing by NZ entities be:

- At a standalone local CCP?
- At a local CCP interoperating with a global CCP?
- As clients of Australian parents, utilising trans-Tasman infrastructure?
- At a global CCP, with NZ banks acting as clearing members?
- At a global CCP, with NZ banks as clients of global bank clearing members?

We address each of these in subsequent sections. Before proceeding however, it is worth clarifying that we use New Zealand as an example, but the models are of general applicability and noting that our discussion of these five alternatives does not consider the additional issues that arrangements for margin segregation may create.²⁷

²⁷ We discuss these further in section 7.4.

4.1 A LOCAL OTC DERIVATIVES CCP

The first option is that an OTC derivatives CCP is built locally, and the authorities compel OTC derivatives traders to use it as direct members. This is further illustrated in Figures 6 and 7.

Figure 6: An illustration of a local NZ CCP

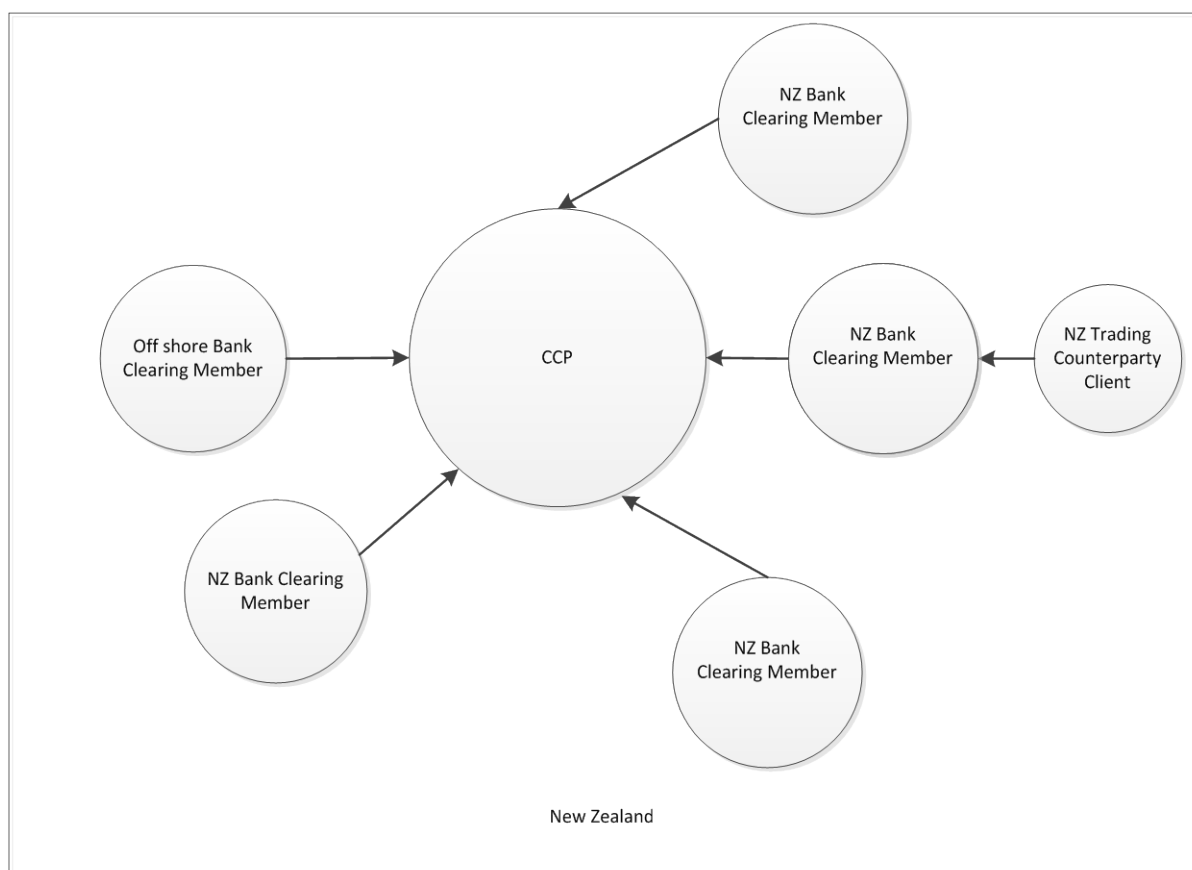


Figure 7: The pros and cons of a local CCP

| <i>Pros</i> | <i>Cons</i> |
|---|---|
| Increased control and greater supervisory nexus; Ability to tailor CCP to local needs and the local legal system ²⁸ ; | CCPs are classic scale businesses so a location requirement would be very costly for all parties: it would also fragment trans-Tasman netting sets. Would a NZ CCP be able and willing to clear the same range of currencies that global CCPs do? If not, netting benefits may be reduced. It is quite uncertain that a local NZ OTC derivative CCP is an economic proposition; who would wish to operate a high cost/low profit CCP? |

²⁸ For there to be confidence in a CCP, there needs to be certainty that the default management process will be conducted quickly and effectively. Existing local laws, such as those relating to property in insolvency and the enforcement of security, can conflict with CCPs' default management processes. Australia (amongst other countries) has taken the view that 'ordinary' laws need to be over-ridden in

| | |
|---|---|
| Greater ability for the RBNZ to ensure that NZ users will not be unduly disadvantaged in the event of off-shore financial stress. ²⁹ | It would be difficult to compel off shore counterparties to clear using the local CCP, and an 'equivalent' local regime would be required. If a local CCP is merely going to post cash IM received back as deposits or repos with local clearing members, systemic risk is not obviously much reduced. This is not the approach taken in Australia. ³⁰ |
|---|---|

4.2 A LOCAL CCP INTEROPERATING WITH A GLOBAL CCP

A second option is that a local (onshore) CCP is built and this 'interoperates'³¹ with the parent clearing service. For example, the New Zealand authorities might compel New Zealand entities to use the local CCP as direct members for certain NZD-dominated products. See Figures 8 and 9 for more detail.

Figure 8: A local CCP interoperating with global CCP

| <i>Pros</i> | <i>Cons</i> |
|---|---|
| <p>It <i>may</i> be more viable for an established CCP operator to build this rather than a fully-fledged local CCP.</p> <p>Interoperability may reduce the fragmentation of NZD netting sets.</p> <p>Increased control of local CCP and an enhanced supervisory nexus.</p> | <p>Interoperability for OTC derivatives is an interesting, though still an evolving, idea. There is a degree to which these arrangements would be experimental and therefore more risky.</p> <p>There is potentially a risk that a larger CCP might 'sever the link' in a local crisis. If there is any chance of that, local firms are quite likely to be better off facing a global CCP.</p> <p>As above, costs would be high, this approach is not taken elsewhere, and further NZ reform would be needed for equivalence.</p> <p>A link between CCPs is a direct channel for contagion, and this risk must be mitigated by some means such as additional financial resources. Whatever method is used, it will entail some additional cost.</p> |

order to address this issue. This was achieved in 2013 through an amendment to the Payment Systems and Netting Act 1998. Similar changes in New Zealand may be called for if clearing is introduced.

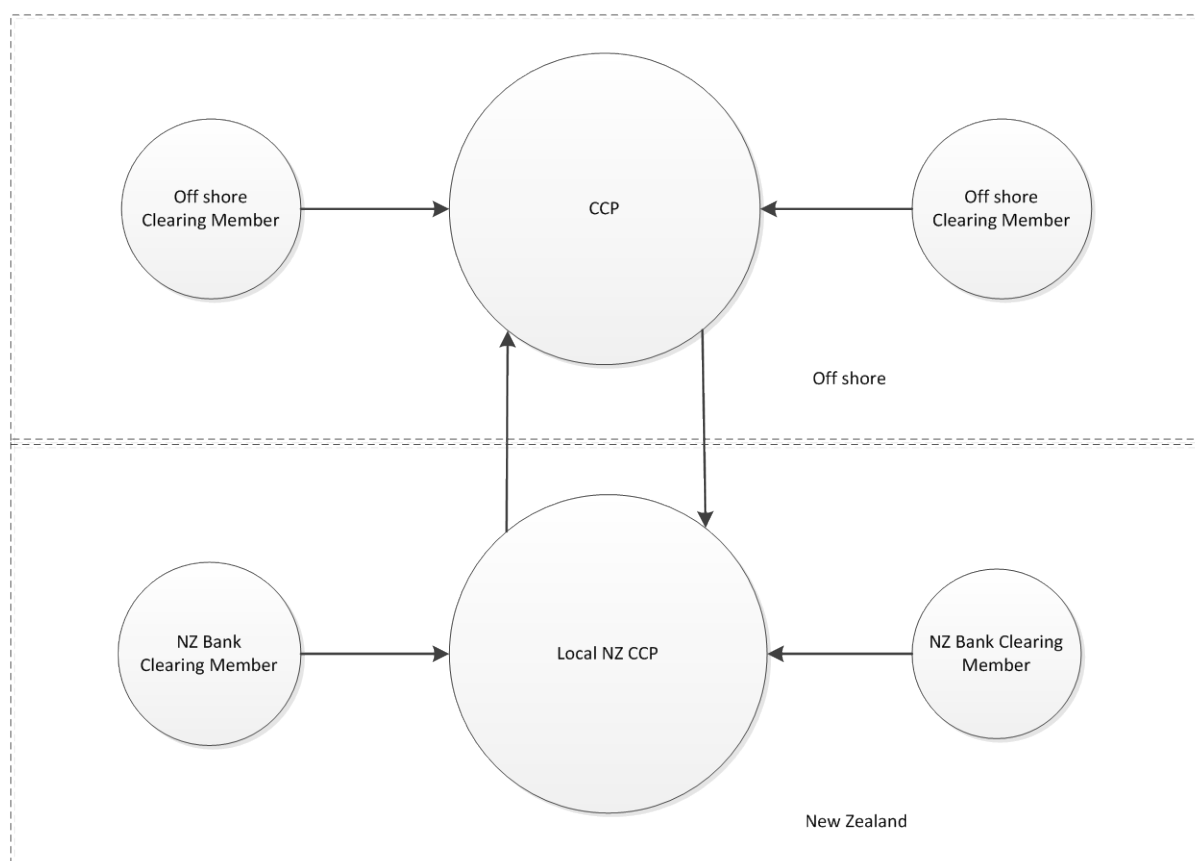
²⁹ The issue here is that an offshore CCP might seek to protect itself from Australian or NZ banks in the event of a Trans-Tasman banking crisis by increasing margin to uneconomic levels or 'cutting loose' clearing members in the region. The right to do this exists in typical global CCPs' rule books.

³⁰ Australia consulted publically on the merits of a local location requirement for clearing. One motivation here was supervisory nexus: see the Australian authorities two *Reports on the Australian OTC Derivatives Market* (October 2012 and July 2013) available at www.cfr.gov.au/publications/cfr-publications/index.html. In this case it was decided to allow market forces to dictate whether clearing will occur on or offshore, although Australia will retain location measures that may be applied to offshore CCPs, with the ability to constrain their operations under the Australian Corporations Act. At present, ASX clears exchange-traded derivatives and has built an OTC derivatives clearing service, and LCH provides an offshore swap clearing service for Australian banks in seventeen currencies including Australian dollars.

³¹ See Garvin (2012).

| | |
|--|---|
| | <p>Nettings sets may still be fragmented, if the local CCP does not offer a full range of products and currencies.</p> <p>If the global CCP enters stress, supervisory action at the local CCP may not be enough to prevent contagion to the small country.</p> |
|--|---|

Figure 9: An illustration of a local CCP interoperating with global CCP



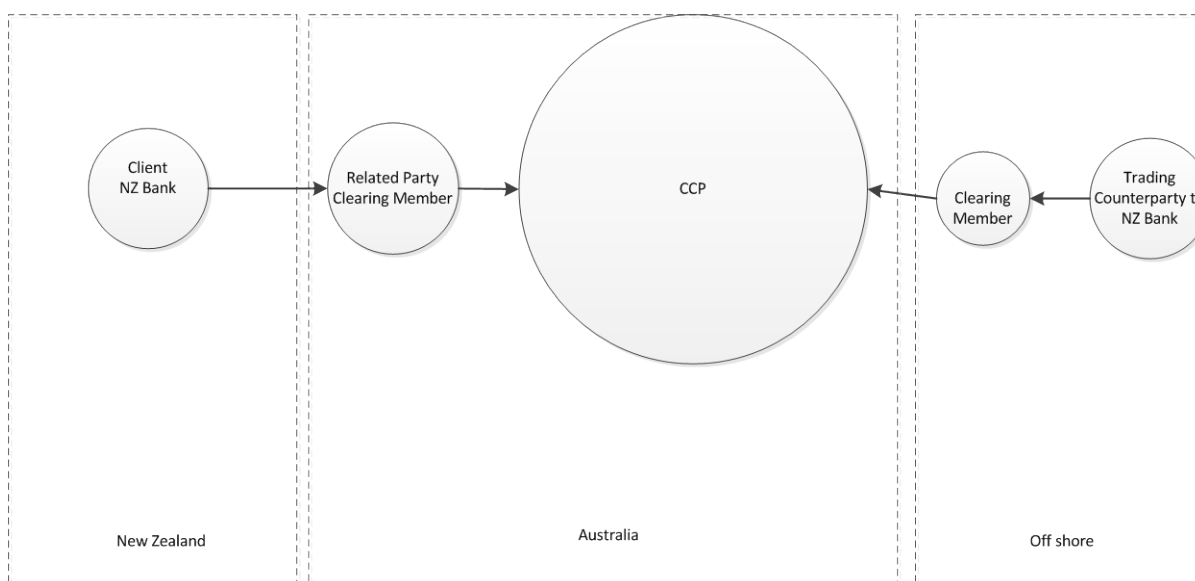
4.3 SMALL COUNTRY USING THE LARGER HOST COUNTRY INFRASTRUCTURE VIA A PARENT

For New Zealand, a third option involves New Zealand entities participating in one or more of the new Australian clearing offerings. For instance, a New Zealand entity could become either a direct member or a client of an Australian direct member of an Australian OTC derivatives clearing services. Figure 10 discusses the benefits and issues with this possibility, and Figure 11 illustrates the structure.

Figure 10: The small country using the larger host country infrastructure via a parent model

| <i>Pros</i> | <i>Cons</i> |
|--|---|
| <p>Reduced ‘conflict of law’ compared to a global CCP as only Australian and NZ law³² are involved.</p> <p>Commercial efficiencies of trading through a related party for most NZ banks (compared to third party clearing brokerage, which is often a relatively expensive service).</p> <p>For those banks with a predominantly trans-Tasman business, membership of a trans-Tasman CCP may be cheaper than membership of a large international CCP.</p> | <p>Increased risk of loss due to contagion from events outside the trans-Tasman zone compared to a local CCP.</p> <p>The model assumes there will be ongoing support for a Trans-Tasman CCP. However, the costs of fragmenting clearing markets along with the comparative lack of currency offsets compared to a larger CCP mean that, at least for banks with a significant international presence, it will be less efficient to use than a global CCP.</p> <p>Local authorities may have a weak supervisory nexus over the parent CM and/or CCP.</p> |

Figure 11: An illustration of the trans-Tasman example



4.4 THE TRADITIONAL MODEL

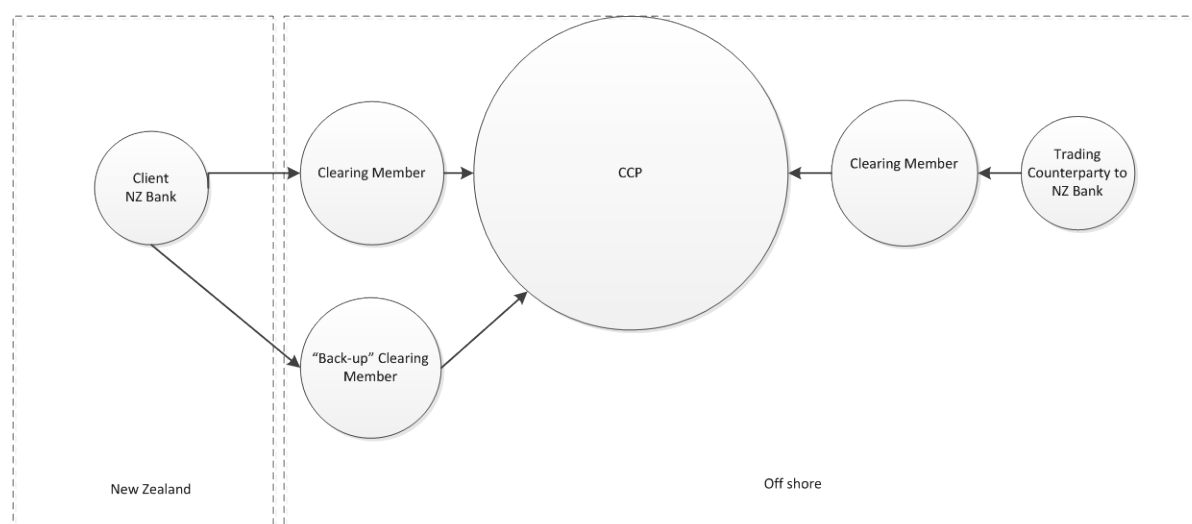
Here local banks would access international infrastructure as separate clients of clearing members. Figure 12 sets out the advantages and disadvantages of this approach, and Figure 13 illustrates the structure.

³² There is also the issue of the sufficiency and liquidity of local currency collateral. NZ banks could, of course, use for example USD denominated collateral for NZD exposures. However, this exposes the CCP to FX risk and overnight liquidity risk when the USD collateral needs to be converted into NZD cash under stressed market conditions. The FX risk may cause the CCP to apply a haircut to foreign currency collateral, which could increase costs for NZ banks.

Figure 12: The traditional New Zealand model extended to cleared OTC derivatives using principal to principal client clearing

| <i>Pros</i> | <i>Cons</i> |
|--|---|
| Based on a tried and tested model; credit risk intermediation through international banks; economies of scale may mean that the clearing service can be offered more cheaply | In the event of a CM failure, the local bank is likely to be dealing with less familiar insolvency law; capital treatment is more onerous than direct clearing relationship; local authorities may have a weak supervisory nexus over the CM and/or CCP ³³ |

Figure 13: An illustration of the traditional New Zealand model extended to cleared OTC derivatives



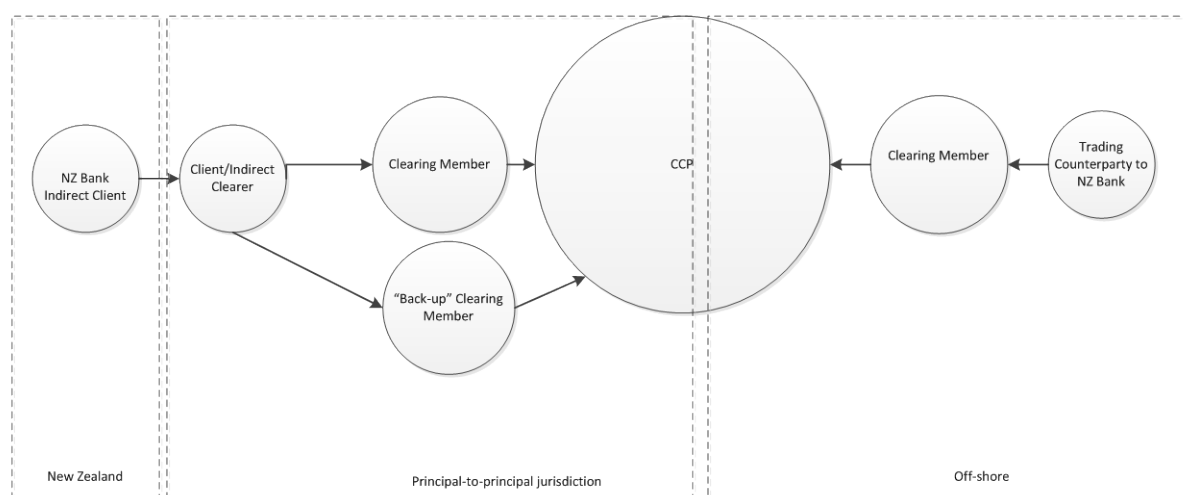
4.5 THE INDIRECT CLIENT MODEL

A fifth option is that New Zealand entities could become formally 'indirect clients' of members of global CCPs. In short, this involves accessing central clearing one-step removed, i.e., as a client of a client of a clearing member. While 'indirect clearing' was motivated, in part, as a solution to smaller EU clients subject to the clearing obligation but who were not commercially attractive clients for large CMs, the model may be offered (and appeal) to non-EU based clients too. Figure 14 describe the features of this alternative in more detail, and figure 15 illustrates it for a principal-to-principal clearing jurisdiction: this model could also be used with agency clearing.

³³ The problem of supervisory nexus in the event of offshore CCP stress is a delicate one: see CFR (2014) for the Australian authorities' discussion of nexus over offshore CCPs in general and this situation in particular.

Figure 14: The pros and cons of indirect clearing at a global CCP

| Pros | Cons |
|---|---|
| NZ bank can maintain existing relationship with smaller brokers; it does not have to go directly to a large international bank. | These arrangements are still evolving. To the extent they offer cheaper access, this may come at the risk of reduced protection for posted margin and increased capital and/or liquidity requirements. |

Figure 15: An illustration of indirect clearing at a global CCP

Each of these design alternatives has inherent benefits and issues: none are perfect, and all involve some extra cost and some financial stability benefits.

5 THE CLEARING MANDATE AND OTHER CONSIDERATIONS FOR A SMALL COUNTRY RESPONDING TO THE OTC DERIVATIVES REFORM AGENDA

G20 supervisors clearly intend to encourage clearing. Many have decreed that there should be a capital advantage to cleared OTC derivatives and that, in case incentives are not enough, certain products must be cleared unless they are traded with an exempt party.³⁴ This suggests the need for small advanced authorities to adopt a policy position. Specifically, what must be cleared; who must clear; and where must clearing happen?³⁵ This was our third key choice:

³⁴ For more on clearing incentives, see DAT (2014).

³⁵ The answers to these questions for the EU can be found at www.esma.europa.eu/page/OTC-derivatives-and-clearing-obligation, while details of the US requirements can be found on the CFTC's website www.cftc.gov.

Choice 3: Should a country like NZ require mandatory clearing of certain OTC derivatives by certain parties? If so, which products and which parties?

We begin by discussing two aspects of this question of the clearing mandate – what is mandated, and who is mandated – before turning to a wider discussion of issues in the design of OTC derivatives reforms.³⁶

5.1 THE DEFINITION OF THE CLEARING MANDATE: PRODUCTS

There are difficult issues around the definition of clearable products. Briefly,³⁷ to be clearable a product should be:

- Standardized;
- Liquid, even in stressed conditions;
- Possessed of risk characteristics that make it straightforward to transparently value and prudently margin.

Similar issues apply with greater force in the definition of mandatory clearable products. There is another dimension to this issue, too:

Choice 6: Should the clearing mandate be defined by products or as an overall constraint?

That is, rather than saying that certain products should be cleared, supervisors could simply require that, for instance, $x\%$ of OTC derivatives traded by a dealer are cleared, or that $y\%$ of their OTC derivatives risk is cleared. This approach would have several advantages:

- It would not impose an arbitrary split of netting sets, instead allowing dealers to keep non-clearable and clearable trades together where this was justified for risk management purposes and provided that they cleared ‘enough’ trades;
- It would ensure that the required percentage of inter-dealer trades was cleared. Dealers could not evade clearing by structuring trades to fall just outside the clearing mandate;

³⁶ Many of the issues discussed in this section and the following two are addressed to a greater or lesser extent in the PFMI. We raise them again partly to discuss the case for a small country to adopt a higher standard, and partly because there are instances (e.g. in the assumption that all of the default fund is available to meet any default loss), where the PFMI assume one design decision from the range available.

³⁷ A further discussion can be found in Sidanius and Wetherilt (2012).

- Clearing mandates do not have to be revised as products innovation occurs; and
- It would give CCPs greater freedom to decide which products they should clear. Moreover, the incentive to clear products which are not prudently clearable would decline as there would be no danger that, having seen that a product is being cleared (albeit not safely so), a supervisor might mandate that it must be cleared.

The disadvantages include:

- Dealers might simply engage in more trading (and more clearing) in order to meet the required threshold;
- Supervisors would lose control over which trades were cleared (although they would all still have to be reported); and
- There would be no standard set of mandated clearable products which new CCPs could aspire to clear.

5.2 THE DEFINITION OF THE CLEARING MANDATE: EXEMPT PARTIES

Most supervisors accept that there should be some parties who are exempt from the clearing mandate. The definition of which parties, exactly, has been controversial. It has been variously suggested that the following should be exempt:

- Governments, multilateral and para-statal agencies, regional and municipal entities and their affiliates;
- Pension funds;
- Cooperative and not-for-profit corporations;
- Corporate end users of OTC derivatives and non-financial entities generally;
- Smaller financial institutions;
- Transactions between affiliates.

Indeed, it almost seems that no one who is not a large OTC derivatives dealer thinks that they should have to clear. The reasons for this reluctance vary from entity to entity, with the difficulty of providing the right amount of CCP-eligible collateral on a timely basis prominent among them. This suggests:

Choice 7: Should the exemptions from the clearing mandate be widely or narrowly drawn?

Figure 16 summarises the situation.

Figure 16: The pros and cons of wide vs. narrow exemptions to the clearing mandate

| | <i>Pro</i> | <i>Con</i> |
|---------------|---|---|
| <i>Wide</i> | Deals with dealers (who pose the most systemic risk); does not impose costs on others | May reduce CCP profitability; may make it easier for new parties to become systemic |
| <i>Narrow</i> | Arbitrage of mandate less easy; more OTC derivatives cleared (probably) | Many non-systemic parties suffer high costs with little regulatory benefit |

5.3 THE DEFINITION OF THE CLEARING MANDATE: LOCATION AND LOCAL COMPLIANCE

Product-specific clearing mandates can split netting sets in a way that increases risk: so too can the requirement to not just clear, but to clear in a specific jurisdiction. A market participant can find that it has to clear one set of derivatives in the European Union; another set in the United States; a third in Japan; and so on. Supervisors may recognise each others' regimes to reduce the impact of this phenomenon. For instance, the European Union authorities might view clearing at an authorised United States clearing house as sufficient to meet the requirements of EMIR; and vice versa.

There is little sign of willingness to permit unconstrained jurisdictional substitution on the reasonable grounds that it might facilitate regulatory arbitrage, but one can easily envisage sufficient cooperation to permit this 'substituted compliance' between rule sets with equivalent outcomes: the story here is evolving.³⁸ Therefore we have:

Choice 8: Should authorities have a wide or narrow definition of substituted compliance?

Figure 17 sets out some of the implications of this choice.

³⁸ See for instance the joint European Commission and CFTC press release EC and CFTC (2013).

5.4 THE DEFINITION OF THE CLEARING MANDATE: SIZE

It is self-evident that requiring more products to be cleared increases the size of clearing houses. As financial institutions get larger, they can become too big to fail, though; or, in the derivatives context, too interconnected to fail. Thus there may be a trade-off between the extent of clearing mandates and the risk of CCPs.

Figure 17: The pros and cons of different scopes of substituted compliance

| | <i>Pro</i> | <i>Con</i> |
|---------------------------------|--|---|
| <i>Wide definition</i> | Pragmatic approach; less extra-territorial | Regulatory arbitrage may be easier; could encourage a race to the bottom |
| <i>Narrow definition or ban</i> | Jurisdictions with relatively more constraining rules can enforce their standards against ones whose interpretation is less constraining | Extra-territorial; higher costs for global dealers; may detract from regulatory cooperation |

We now turn to some of the general choices in central clearing design, looking not just at the options selected in practice, but also at their alternatives. For each choice, we will set out what it is, and the advantages and disadvantages of the alternatives. We split this discussion into decisions relating to the level of financial resources and the design of waterfalls in this section, and those which concern CCP organisation in the one after that. This discussion illustrates that the gamut of clearing design is significantly wider than the choices available in extant global CCPs, and thus – if the benefits obtained were supposed to exceed the costs – a country could encourage or even require that local clearing houses are different in one or more dimensions to those available off-shore.

6 CHOICES RELATING TO CCP FINANCIAL RESOURCES

First, then, CCP financial resources. There are a wide range of questions which must be answered when the capital structure of a CCP is designed including:

- How is initial margin ('IM') determined?
- How are default fund ('DF') contributions determined?
- Once a defaulting clearing member's margin and default fund contributions are exhausted, whose funds are used to absorb any remaining losses in what proportion?
- How much equity does the CCP have and when is it at risk?
- When (if ever) will a clearing house be allowed to fail?

- How are non-default losses, such as those caused by operational or investment risk, absorbed?
- When are capital calls made, how are they determined, and what limit (if any) is there on their size?

We begin by looking at the level of initial margin and default fund, as bearing counterparty credit risk is a key function of a CCP. After this, more extreme losses are considered.

6.1 THE LEVEL OF INITIAL MARGIN AND DEFAULT FUND

Initial margin and default fund are both elements in OTC derivatives CCPs' default waterfalls. Higher levels of DF can compensate for lower levels of IM and vice versa. Therefore we pose the choices relating to these two elements of financial resources in one section. First, initial margin:

Choice 9: Should initial margin be set at a higher or a lower level?

High levels of initial margin imply excessive costs for all. They also encourage 'innovative' ways of sourcing collateral, and may leave CCPs with higher levels of investment risk. In contrast, low levels mean an increased probability of losses extending beyond margin and that capital calls are more likely. However, an under-margined CCP will often have a competitive advantage compared with any more prudent peers it may have.

Choice 10: Should default fund be set at a high or a low level?

Higher levels of default fund allow CCPs to be robust even if clearing member default co-movement is elevated: they are more crisis-proof.³⁹ This comes at a significant cost to clearing members, as they have to provide these funds, and take the risk that they will be used to absorb the losses of others.

There is an interaction between IM and DF in that some degree of imprudence or model risk in IM can, at least from the CCP's perspective, be compensated for by higher DF, and vice

³⁹ Roughly speaking, margin is taken separately for each clearing member: it therefore mitigates losses in the CCP's univariate distribution of counterparty credit risk for each CM. Default fund is however a mutualised resource, so it mitigates losses in the complete (multivariate) loss distribution. Constructing the multivariate distribution from the univariate ones requires the use of a default co-movement assumption: risk estimates for this distribution are therefore vulnerable to errors in that assumption. See Murphy and Nahai-Williamson (2014) for more details.

versa. Using DF in place of IM, though, requires clearing members to subsidise the risk of their clients, since only clearing members pay DF, while everyone pays margin.⁴⁰

When DF is high, incentives may be blunted due to over-mutualisation. This is especially the case if IM is too low: in this case, the defaulter's IM and DF can be absorbed even without a really unusual loss event, and in this case, everyone's DF is at risk. This means that there is little incentive to do due diligence on cleared OTC derivatives counterparties, as the consequences of a bad loss are visited on all clearing members. Figure 18 summarises the advantages and disadvantages of differing margin and default fund levels, and the interaction between the various choices.

Figure 18: The pros (above) and cons (below) of differing initial margin and default fund levels

| DF Level | <i>High</i> | <i>Low</i> |
|-------------|--|--|
| IM Level | | |
| <i>High</i> | CCPs are very robust against credit risk losses | CCPs can still be safe; CMs do not subsidise clients |
| <i>Low</i> | CCPs can still be safe; client clearing is cheaper | Lower costs for all |

| DF Level | <i>High</i> | <i>Low</i> |
|-------------|--|---|
| IM Level | | |
| <i>High</i> | Egregious cost; increased liquidity risk | Residual risk may be significant |
| <i>Low</i> | Low incentive for counterparty due diligence | High CCP solvency risk; greater chance of loss allocation |

6.2 THE MARKET RISK SENSITIVITY OF FINANCIAL RESOURCES

The next design decision concerns the nature of the methodology used to calculate IM:

Choice 11: Should IM models be highly risk sensitive?

The problem here is procyclicality⁴¹: if financial resources models are highly risk sensitive, then by definition risk as measured by the model increases in a stressed period. This means

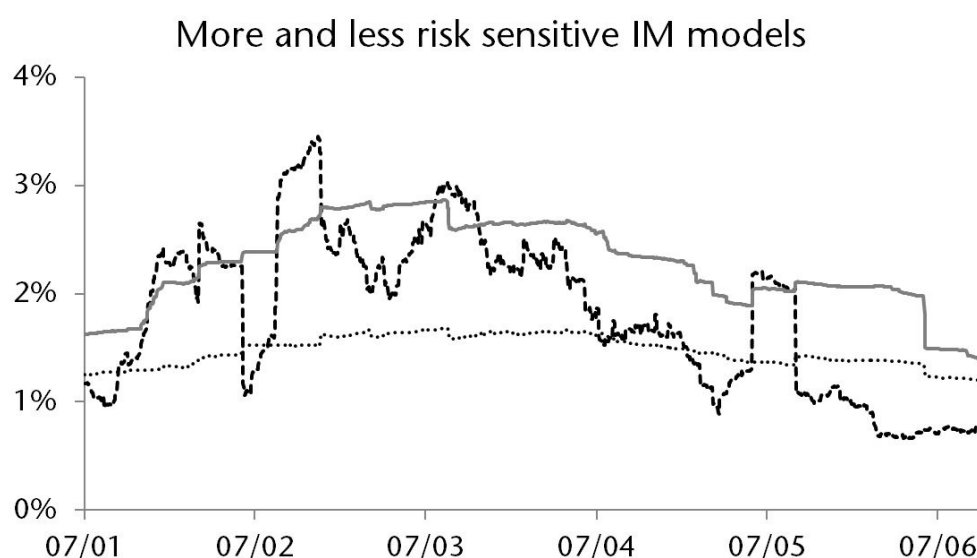
⁴⁰ Clearing members, of course, would seek to recover this subsidy via clearing fees.

⁴¹ For more on procyclicality of margin, see Murphy et al. (2014).

that IM assessments go up, drawing liquidity down just when institutions can afford it the least. If financial resources models are less sensitive, then to avoid DF breaches they must require high levels of margin at all times. This means that market participants pay more than they need to most of the time in exchange for less liquidity risk.

Figure 19 illustrates the issues here. The procyclical model produces margin requirements which vary substantially. There are two less procyclical models, but of these only the one which produces high, stable requirements is prudent.

Figure 19: Initial margin requirements calculated using a risk sensitive model (the dashed black line), a reasonably prudent but less procyclical model (the solid grey line), and a less prudent but not procyclical model (the dotted line)



This leaves us with the choice between

- Risk sensitivity, lower average margin requirements, but procyclical liquidity risk; or
- Stable low margin requirements which reduce costs for end-users but which increase the risk that CCPs will not be robust when clearing members default, and which supervisors are therefore likely to reject; or
- Stable high margin requirements which make CCPs credible counterparties but which may make it uneconomic for some end users to hedge their business risks.

6.3 THE CREDIT RISK SENSITIVITY OF FINANCIAL RESOURCES

A related question is whether financial resources should depend on the credit quality of counterparties:

Choice 12: To what extent, if any, should IM and/or DF requirements depend on the credit quality of the clearing member they pertain to?

Most CCPs use margin models with little or no credit-risk-sensitivity. However there is no reason in principle why this could not be applied to a greater extent. The table in Figure 20 summarises the issues.

Figure 20: The pros and cons of credit-sensitive IM

| | <i>High credit sensitivity</i> | <i>Low or no credit sensitivity</i> |
|------------|---|--|
| <i>Pro</i> | No implicit subsidy of bad credits by good ones; CCP financial resources rise in a crisis; strong incentive for CMs to preserve good credit quality; defaulter pays ⁴² | Less procyclical; encourages smaller firms to become CMs |
| <i>Con</i> | Highly procyclical | Bad credits subsidised by good ones; little or no disincentive to or extra protection from worsening CMs |

Notice that if CCPs charged IM based on the market credit spread of their counterparties, then they could incorporate all the information available in such spreads into their margin levels (whether relevant or not). This would at least not suffer from the cliff effects and lag which would be associated with a margin based on credit ratings, although it would result in much more variability of margin levels. This kind of credit-risk-sensitive IM would share many of the characteristics of a market-based unilateral Credit Valuation Adjustment.

6.4 DEGREE OF MUTUALISATION

Most CCPs use a default waterfall where first the defaulter's IM and DF are at risk, then the CCP has some equity ('skin in the game'), then the rest of the (mutualised) DF is at risk: slight variants on this design, and various 'end of the waterfall' approaches are also widespread.⁴³ Nevertheless, this is not the only choice. The questions here include:

Choice 13: Should lower levels of mutualisation, perhaps based on the level of trading with the defaulter, precede or replace full loss mutualisation?

⁴² We are sensitive however to the criticism that 'defaulter pays' really means 'defaulter's unsecured creditors pay': see Bebchuk and Fried (1996) and Roe (2011).

⁴³ See Elliott (2013) and Gibson (2013).

The idea here is that loss mutualisation does not promote counterparty due diligence. Perhaps it would be better to encourage parties to make accurate credit assessments by giving them an incentive. Thus rather than complete mutualisation of the DF, we could have a non-defaulting CM's DF contributions at risk only to the extent that they had dealt with the defaulter. CMs who correctly foresaw trouble and spurned trading opportunities with the eventual defaulter would not run the risk of loss mutualisation (or perhaps would only be at risk after the DFs of the defaulter's trading partners were exhausted). This would mitigate the moral hazard whereby no clearing member can avoid the costs of another's default so they are less incentivised to take steps to mitigate this risk.

This design decision brings up the same question as in choice 12: to what extent should all clearing members be treated identically? Clearly more uniformity makes it easier for smaller firms to become clearing members, and hence discourages market concentration. All else equal, this is probably a good thing. But smaller firms may be worse credits; they may have fewer resources to contribute to default management; and they may have less effective risk management generally. The right balance between encouraging a diverse 'ecology' of market participants and discouraging prudent clearing members by making them bear costs created by the imprudent is not clear. Indeed, we could phrase the general issue as:

Choice 14: To what extent should all clearing members be treated equally?

A lower level of mutualisation (i.e. less equality) means that the DF benefits from less diversification, and hence DF contributions might have to be higher to achieve the same degree of safety. In turn this could affect the affordability of clearing. On the other hand, since higher DF levels make CCPs robust even if defaults are highly correlated,⁴⁴ that is not necessarily wholly bad.

6.5 CCP EQUITY

The regulatory framework for banks has constraints on capital as a key element. This suggests that one should consider:

Choice 15: What methodology should be used to set minimum capital requirements for CCPs?

⁴⁴ As we mentioned in footnote 34, default correlation (or, more generally, default co-movement) is relevant because we care about the multivariate loss distribution. When default correlation is high, the occurrence of one clearing member default means that further defaults are more likely than if default correlation is lower.

In order to answer this, we need to consider the roles of CCP equity. These include at least the following:

- Absorbing losses which cannot be allocated to CMs (e.g. due to operational risk);
- Giving the CCP 'skin in the game' or otherwise incentivising certain behaviours;
- Keeping confidence in the CCP;
- Absorbing default losses at certain stage(s) in the default waterfall; and
- Funding the CCP through resolution and possible wind-down.

Given this, the right blend between a fixed minimum capital level and a risk-based add-on is a key issue. Moreover, there is a trade-off between rather high standards, which make CCPs safer but which discourage CCP competition; and somewhat lower ones, which give CCPs less ability to withstand losses before failing but which may make a challenge to incumbent CCPs more likely.⁴⁵

6.6 CAPITAL CALLS AND LOSS ALLOCATION

Once a CCP's DF is exhausted, the essential issue is who bears 'far tail' credit risk losses, and how. Some of the key questions are:

- Should far tail losses be absorbed by CCP members through a loss allocation and/or capital call mechanism?
- Should CCPs be allowed to go bankrupt and, if that is sometimes undesirable, how should they be resolved?⁴⁶

Thus we have:

Choice 16: How should losses beyond a CCP's funded financial resources be borne?

Figure 21 sets out some of the issues here.

⁴⁵ One solution which has been proposed is the use of contingent capital structures which make more resources available if certain losses are realised. Insofar as these structures make third party capital available to the CCP, they are potentially welcome; but much depends on the loss events covered, the prefunding of (and hence lack of credit risk in) the structure, the nature of the resources provided, and its term.

⁴⁶ The CCP resolution authority is often the central bank, although in some jurisdictions it might be a separate infrastructure overseer or some other body. Whatever the formal structure, resolution may ultimately be at least partly a central banking issue if there is a liquidity dimension to the systemic risk considerations. See CPMI and IOSCO (2014) for a further discussion of the issues here.

Figure 21: The pros and cons of various far tail CCP loss allocation mechanisms

| | <i>Pro</i> | <i>Con</i> |
|--|--|---|
| <i>Limited capital call</i> | Extra resources are provided contractually, limit to CM liability | Pushes some or all CCP tail default risk back on to CMs |
| <i>Unlimited capital call</i> | Contractual provision and CCP only fails when all CMs do | |
| <i>Haircutting variation margin ('VM')</i> | Parties who gained, pay; encourages CMs to reduce their cleared risk; likely to be close to the distribution of losses in CCP bankruptcy | Creates uncertainty for clearing participants as to whether a hedge is as effective during the default management process |
| <i>Haircutting IM</i> | Parties who took the most risk pay | Loss allocation may be unrelated to defaulter(s)' positions |
| <i>Bankruptcy</i> | Risk of this encourages CMs to do due diligence on CCPs (although this also holds to some degree for other options) | Likely to be destabilising; total cost likely to be larger |
| <i>Nationalisation</i> | Contract continuity; reduction of systemic risk | Cost to taxpayer; moral hazard |

Most leading CCPs have a contractual right to call for additional default fund contributions, and some can allocate investment losses to clearing members. Beyond this, however, there is still debate on which tools are best suited to recovering CCPs, and indeed this may vary from CCP to CCP.

7 CHOICES RELATING TO CCP ORGANISATION

In the last section we saw that there are credible alternatives to the usual way that CCPs protect themselves and allocate default losses. Here we turn to similar choices relating to the organisation of CCPs. Specifically we examine possibilities relating to CCP ownership; competition issues; CCP governance arrangements; the criteria for membership of CCPs; and segregation.

7.1 MARKET STRUCTURE

There are two main models of the arrangement of clearing and settlement services:

- In the 'vertical' clearing model, an exchange (or some other form of market) owns the clearing house that clears its trades, and this CCP only clears trades made on its parent's market; whereas
- In the 'horizontal' model, clearing houses are separately owned⁴⁷ and potentially able to clear trades made on multiple markets. There may be competition between CCPs in this model.

This gives rise to:

Choice 17: Should OTC derivatives CCPs follow the vertical model, the horizontal model, or should both be permitted?

The debate about which model is best is a complex and at times vociferous one. We summarise some of the main issues in Figure 22 and refer to CPMI (2010) for a further discussion.

Figure 22: The pros and cons of various models of clearing

| | <i>Pro</i> | <i>Con</i> |
|-------------------------|--|---|
| <i>Vertical Model</i> | Allows economies of scale to be captured; allows a CCP to be customised to a given market's products | Potential for monopoly rents; opaque pricing of clearing; new entrants are discouraged |
| <i>Horizontal Model</i> | Users can select the best service at each stage; harder for CCPs to extract monopoly profits | Multiple CCPs, if present, are inefficient and create additional costs; CCP ownership issues; there may be few choices available with little real competition |

7.2 THE MANY OR THE FEW?

A related debate concerns CCP competition. Even with one jurisdiction, should there be multiple competing CCPs, or are clearing houses in fact 'natural monopolies' where there are substantial cost savings if a single body serves multiple execution venues? Hence:

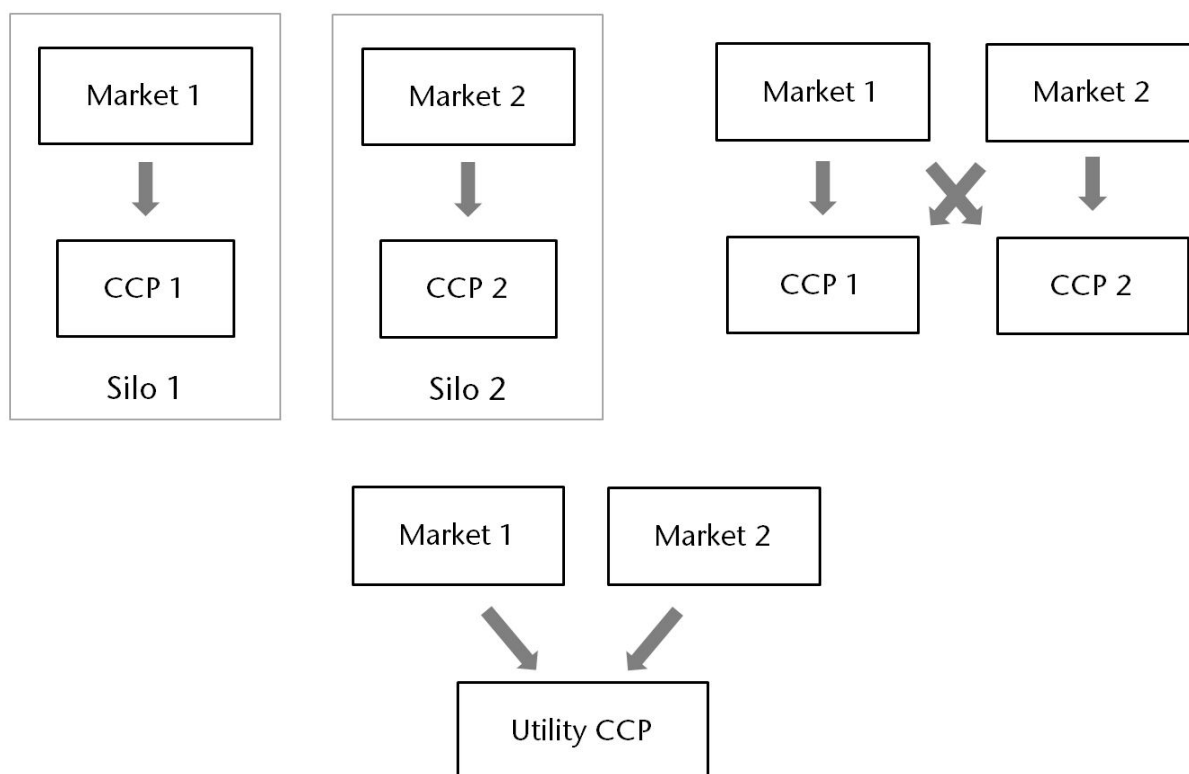
⁴⁷ Either by their members or by third parties.

Choice 18: Should OTC derivatives CCPs be monopoly utilities or should there be competition between different for-profit CCPs?

Clearly the vertical model from the last section requires multiple CCPs (at least one for each market), whereas horizontal arrangements allow for but do not require a common clearer. Figure 23 illustrates the alternatives here.

If one were a client wanting to trade a single swap with no pre-existing portfolio, then CCP competition would be desirable as that would be more likely to lead to lower clearing fees. Large clearing members, in contrast, might tend to prefer a single utility CCP as that brings the most multilateral netting benefits. Indeed, the benefit of being able to offer netting with already cleared trades is a substantial selling point for incumbent CCPs and perhaps justifies the suggestion that OTC derivatives clearing is a natural monopoly. Natural monopolies are often subject to price regulation, though, so a clearing model which uses utility CCPs would require that the cost as well as the safety of central clearing attracts supervisory attention.

Figure 23: An illustration of the vertical model of clearing (above left); the horizontal model with CCP competition (above right) and the utility clearing model (below)



Neither the horizontal nor vertical models preclude CCP interoperability. However, vertical structures are typically less conducive to interoperability and are likely to result in more fragmentation of OTC derivatives clearing.

7.3 THE GOVERNANCE OF OTC DERIVATIVES CLEARING HOUSES

Many of the concerns articulated in the last section relate to the possibility that clearing houses might charge higher fees for clearing than is economically efficient or otherwise abuse their power. These concerns can, to a certain extent, be mitigated by governance. That is, CCP owners' freedom of action can be reduced by requiring that they take account of the views of users to some degree – if indeed the owners are not the users. CCPs typically have one or more risk committees that can act as venues for users to express their views, but the issue is larger than this: potentially CCPs could be required to include users in service pricing as well as risk decisions. This would intrude on the power of owners, but in a fashion that is commonplace among regulated utilities. Hence:

Choice 19: To what extent should OTC derivatives CCPs be required to take account of the views of their users?

7.4 CLEARING MEMBERSHIP

Consider the following (caricatured) alternatives:

- Big Boys CCP permits only the top ten global derivatives dealers to apply for membership. Members must have a net worth of at least \$25 billion; they must have over five years proven expertise in trading commodity, credit, equity, FX and interest rate derivatives; and they must have successfully managed at least 100 client defaults.
- Small-is-beautiful CCP permits any firm with a net worth of at least \$10 million to apply for membership. Members must either attest that they have default management expertise or sign a contract with an agreed expert clearing member which 'outsources' participation in this process.

These are two very different concepts of a clearing house. The first is a piece of infrastructure which primarily addresses inter-dealer transactions; the latter is a much wider idea of a CCP. The contrast suggests:

Choice 20: How high should the bar be set on clearing membership?

A high bar results in fewer potential members, and hence could lead to market concentration due to the lack of competition among clearing members. It does however mean that CMs are likely to be safer; that they are more likely to be able to successfully participate in default management; and that they are more likely to be able to meet a capital call.

If a wider range of potential clearing members are allowed, then competition is promoted. Moreover, it could be argued that it is unfair both to mandate clearing and for there not to be any CCPs which allow medium sized or smaller banks to become clearing members, so this might suggest a low bar. On the other hand, wider membership means that there could be members who cannot actively participate in default management; that there is a wide range of different credit qualities of member (and thus there are lower quality members who pose higher risks to the CCP); and that some members may have more difficulty in meeting large VM or IM calls and/or capital calls (e.g., DF contributions; unfunded assessment obligations). None of these is desirable.

This choice interacts with others, too. If IM is high, then having a wide range of credit quality among CMs may not matter that much. On the other hand, if IM is low and credit-risk-insensitive, then there is significant subsidy from better to worse credit quality CMs through the DF. Losses beyond margin are also significantly more likely. Thus there are really three concepts:

1. A CCP which primarily admits large dealers as members, and which does not need to distinguish between member quality as they are all similar;
2. A CCP which admits a much wider range of clearing members and which treats them all identically; and
3. A CCP which admits a much wider range of clearing members and which varies IM and perhaps DF depending on clearing member credit quality.

The second alternative might be unattractive to large banks; were they to join such a CCP as clearing members, they might well bear a disproportionate burden. Without any big firms as CMs, though, such a CCP might find it hard to attract enough business to survive. Thus CCPs and policy makers need to carefully balance having a larger number of diverse CMs with having a smaller number of higher quality CMs.

The bar for clearing membership also interacts with the choice of default fund level. Figure 24 sets out the issues here.

Figure 24: The interaction between default fund levels and the bar for clearing membership

| | <i>High CM Bar</i> | <i>Low CM Bar</i> |
|----------------|--|--|
| <i>High DF</i> | Only SIFIs can be CMs and they bear most of the tail risk | Tail risk loss absorption is spread over more firms |
| <i>Low DF</i> | Reduces costs for CMs, but high IM is needed to make CCPs safe | Financial stability depends critically on the prudence of CCP's IM methodology |

A key issue here is whether having a small group of high credit quality CMs makes the financial system more stable, or whether it creates too much concentration and contagion risk. Certainly if only a meagre handful of firms carry out most of the client clearing at global CCPs then these firms (in addition to the CCPs themselves) can be single points of failure for the financial system.

7.5 SEGREGATION AND PORTABILITY

The issues of segregation models⁴⁸ and their impact on client portability deserve their own article: they are both legally and operationally complex⁴⁹, so we include them here merely for completeness. In brief, higher levels of segregation offer more protection to margin and facilitate portability of client positions. On the other hand, they cost more and create more liquidity risk. We have then:

Choice 21: What level(s) of margin segregation should CCPs be required to provide?

The effectiveness of segregation and portability arrangements is a key policy issue for New Zealand, either under the failure of a foreign clearing member or a local institution. The analysis here is subtle not least due to the potential interplay of foreign and local bankruptcy, recovery and resolution arrangements, collateral policies, custodial arrangements, and client asset protections.

⁴⁸ 'Segregation' refers to the ability to identify an asset as the property of a client. Thus an effective segregation arrangement allows clients assets, such as collateral, to be remote from the bankruptcy of the entity holding them. A related issue is 'portability': this is the ability to transfer (or 'port') a client's cleared portfolio from one clearing member to another. Clearly if the client's assets are properly segregated, then porting is substantially easier. However, portability is unlikely unless the 'target' clearing member already has a clearing relationship with the client. In practice this means that clients will likely need multiple clearing agreements, something that is likely to be costly.

⁴⁹ See for instance Osborn (2013).

8 OPPOSING PARADIGMS

There are a number of principles which serve to organise the choices of the previous sections. These represent the irreducible trade-offs in the design of OTC derivatives clearing. One such obvious public policy choice is cost vs. safety. Another is credit risk vs. liquidity risk. In this section we examine a third trade-off, which we dub uniformity vs. differentiation. First, an explanation of these terms:

8.1 THE TERMS 'UNIFORM' AND 'DIFFERENTIATED'

We use the term 'uniform' to refer to arrangements whereby parties are treated in the same manner. Thus for instance charging the same IM for the same portfolio regardless of the counterparty is in our terms uniform; while counterparty credit quality-sensitive margin is 'differentiated'.

Another key distinction is that in arrangements which we dub 'differentiated', parties typically bear all (or at least more) of the consequences of their decisions, while in uniform arrangements losses, or profits, or both, are widely shared. Thus for instance the typical CCP DF is uniform, in that losses are shared mutually. On the other hand, arrangements where loss allocation depends on the degree of trading with the defaulter are more differentiated. Very differentiated arrangements therefore tend to have better incentive structures than strictly uniform ones, but lower loss absorption. We see this, for instance, where parties who did not trade with the defaulter do not bear default losses.

8.2 DIFFERENTIATED AND UNIFORM ARRANGEMENTS COMPARED

Figure 25 compares some of the key features of the differentiated and uniform paradigms.

Figure 25: Differentiated vs. Uniform clearing paradigms

| Feature | <i>Differentiated</i> | <i>Uniform</i> |
|--|---------------------------------------|---------------------------------|
| <i>Key property</i> | Good incentives | Fairness |
| <i>Moral hazard</i> | Less | More |
| <i>Membership</i> | High bar | Lower or no bar |
| <i>Credit-sensitive initial margin</i> | Yes | No |
| <i>Loss allocation</i> | Based on trading with defaulter | Mutual |
| <i>CCP failure</i> | Once limit on loss allocation reached | Only after all CMs fail |
| <i>Capital use</i> | Less efficient (as less mutualised) | More efficient |
| <i>Large dealers</i> | Matter more, as only they have the | Matter less: it is easier for a |

| | | |
|---------------------|-------------------------------|--------------------------|
| | resources required to compete | smaller firm to compete |
| <i>Market share</i> | Concentrated in a few dealers | Spread over more dealers |

There is a natural tension between more and less mutual arrangements in many areas of finance, and OTC derivatives clearing is simply one example. Moreover, of course, clearing arrangements can be more uniform in one dimension and more differentiated in another: there is nothing contradictory about combining, for instance, a high membership bar with equal loss allocation and credit-insensitive margin. Indeed, this can be thought of as uniformity for the few rather than the many.

8.3 MARKET AND CLIENT SPECIFICITIES

The uniform vs. differentiated distinction extends to the market, and to clients, thanks to two different conceptions of trading:

- In an extreme form of a uniform market, market makers would be compelled to engage in trades with any willing party in normal size at the advertised price, clients would trade anonymously, client terms would be standardised, and CCPs would be compelled to clear clearable trades regardless of counterparty.
- In a fully differentiated market, trading would be optional, all market participants' identities would be disclosed, client terms would be individually negotiated, and CCPs could reject clearable trades should they so desire.

9 CONCLUSIONS

We might characterise the supervisory measures relating to OTC derivatives enacted since the 2008-9 financial crisis as phased. In the first phase, in immediate response to the crisis, the largest jurisdictions used and expanded upon existing central clearing infrastructure to restructure and reduce counterparty credit risk. That work programme is nearing completion. Consequently, there is an opportunity to review the new clearing regulations, and to consider their efficacy at improving financial stability and facilitating economically valuable hedging activity given the likely market reactions to the reforms. In this second phase, non-G20 countries can review international developments and their own regulatory frameworks, and consider the case for reform.

In some sense such jurisdictions, like New Zealand, are 'along for the ride' without primary influence over international regulatory change. However, they can also learn from the early adopters and ensure that their regulatory choices are informed by experience of what seems

to work well, given a plethora of constraints. Our aim in this paper is simply to stimulate debate about the merits of the various choices available in the design of OTC derivatives regulation as this experience is gathered.

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