

# Reassessing the Costs and Benefits of Centrally Clearing the Australian Bond Market

Jon Cheshire and Joanne Embry<sup>[\*]</sup>



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## Abstract

This article considers the costs and benefits of centrally clearing the Australian bond market, in light of developments in the market since the Reserve Bank's last review in 2015. On balance, our analysis suggests that changes to the size and structure of the Australian bond market have strengthened the case for central clearing. These changes include substantial growth in the size of the market, increased participation of non-resident investors and increased complexity resulting from the growing number of bilateral clearing arrangements. Central clearing would simplify the market structure and could yield other benefits, especially in times of stress. For example, our estimates suggest multilateral netting has the potential to lower settlement obligations by \$60 billion per day. This is more than can be achieved with bilateral netting. Further, market resilience and liquidity conditions might also be improved by multilateral netting as interbank participants' balance sheet constraints are reduced. The key challenge for a potential central counterparty would be to develop a sufficiently wide network of products and participants to achieve overall benefits. Some participants face a lower incentive to join and in their absence the potential benefits from central clearing would be reduced.

## Introduction

Since the global financial crisis (GFC), central clearing has come into sharper focus by policy-

makers around the world. The principal reason for this is that, under the right conditions, it is possible for central clearing to increase the efficiency and

stability of financial markets. Indeed, the increased use of central clearing in the over-the-counter (OTC) interest-rate-derivative markets over the past decade or so has generally been seen as having increased resilience in these markets (FSB 2018a; FSB 2018b; ISDA 2021; IAWG 2022).

There is a current debate, particularly in the United States, over whether there would be benefits from expanding the use of central clearing in bond markets. However, central clearing may not be appropriate for all markets and is also not a cure-all for market functioning and financial stability issues that might arise in the course of their operation. Nonetheless, the Financial Stability Board has suggested there would be merit in exploring the increased use of central clearing in bond and repurchase agreement (repo) markets, and has recommended that authorities evaluate the costs and benefits of introducing central counterparties (CCPs) into their interdealer repo markets where they do not exist (FSB 2013; FSB 2022).

In 2015, after public consultation, the Reserve Bank concluded that, at that time, there was no financial stability case to actively promote the introduction of a CCP in the Australian bond market (RBA 2015a). Against this background, the article begins with a discussion of the changes in the Australian bond market over the past seven years. This is followed by consideration of some of the potential costs and benefits of central clearing and an overview of the scope of products and level of participation that would affect its viability.<sup>[1]</sup>

### Current market structure versus central clearing

After a financial market securities trade is executed, it is confirmed, cleared and then settled. Trade confirmation involves the two counterparties confirming the details of the transaction with each other. The process of clearing involves the calculation of participants' obligations to make payments or deliver securities in order to establish final positions for settlement. Settlement occurs after clearing and involves the exchange of funds for securities.

Clearing in the Australian bond and repo markets currently occurs bilaterally and reflects the complex web of transactions among participants that are yet to be settled (Figure 1). Central clearing involves placing a single counterparty as an intermediary for each transaction. The CCP becomes the buyer to every seller and the seller to every buyer (Figure 2). The result is a simpler hub and spoke network of transactions that are yet to be settled, but one that is dependent on the CCP.

### Review of changes since 2015

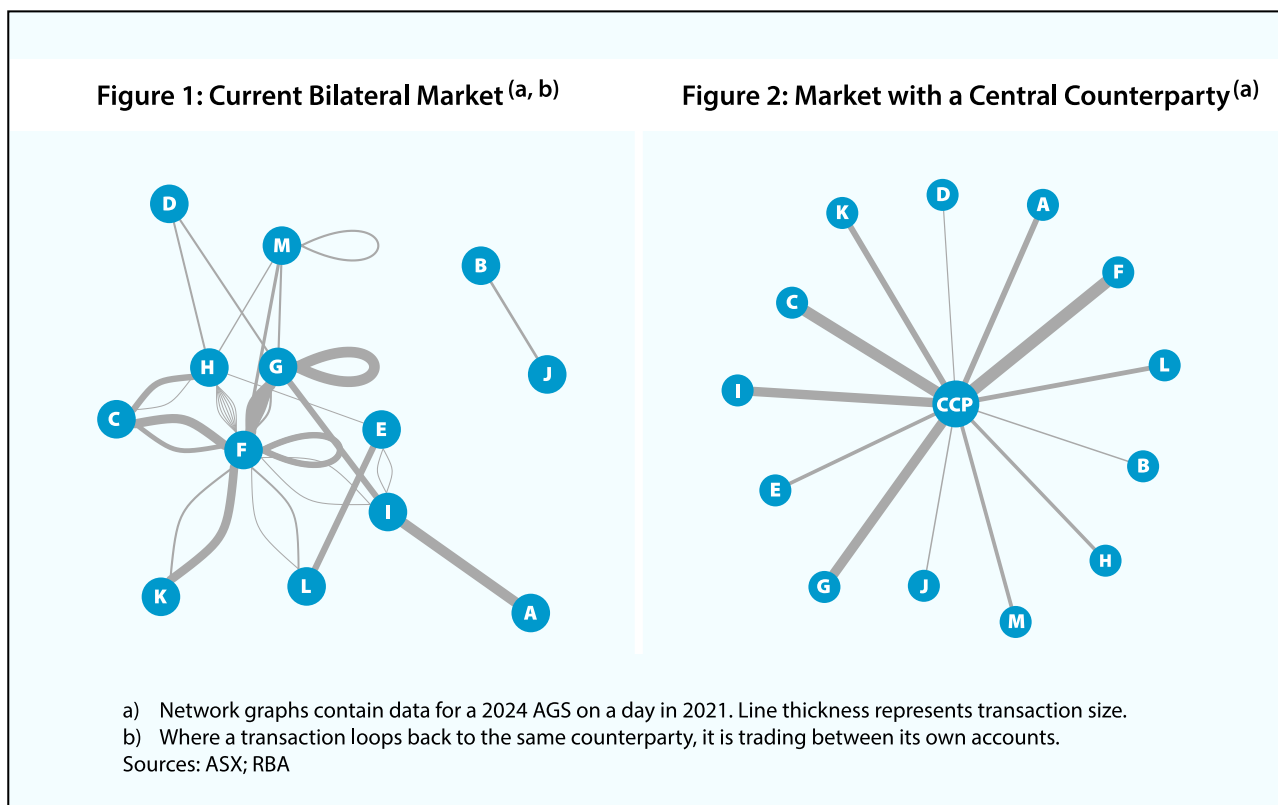
The 'dash for cash' in the US Treasuries market in early 2020 re-energised discussion over whether greater use of central clearing would improve the functioning of that market.<sup>[2]</sup> It is estimated that virtually all interdealer transactions in US Treasuries prior to the mid-2000s were centrally cleared. However, the entry of new participants since that time that do not centrally clear has accompanied a decline in its use, such that three-quarters of the current market is not centrally cleared (Chaboud *et al* 2022).

It is generally agreed that centrally clearing bond market trades can provide a number of benefits, including enhanced efficiency, transparency and market stability (ISDA 2022). Because of these benefits, some, including a G30 Working Group on Treasury Market Liquidity, have called for a mandate to encourage greater central clearing of US Treasuries; in September 2022, the US Securities and Exchange Commission (SEC) proposed a similar mandate (G30 2022; SEC 2022; McCormick and Schulhofer-Wohl 2022).

### The Australian bond market has become larger and more important

Significant growth in outstanding issuance in the Australian bond market prompts the question as to whether the bilateral clearing arrangements that served the bond market while it was considerably smaller remains appropriate today. Growth in the Australian bond market over the past decade or so has been particularly prominent in the case of Australian Government Securities (AGS), where outstanding issuance increased from around 10 per cent of GDP prior to the GFC to around

**Figures 1 and 2**



55 per cent in 2022. The larger volume of outstanding issuance has supported a greater level of activity in the Australian bond market. One example of this can be seen in the market for repos, which grew from a stock of around \$170 billion in 2015 to around \$300 billion in 2022.

As the bond market has grown, it has also come to play a more important role in the management of risks in the broader financial sector. Banks now make greater use of the bond market compared with a few years ago, holding over three times more AGS (as high quality liquid assets (HQLAs)) to meet their prudential liquidity requirements. Debt securities are also used by many participants in financial markets to meet margin and collateral requirements, which have increased in recent years.

It also worth noting that between 2001 and 2004, ASX operated the Bond and Repo Clearing service. It is estimated that, by June 2004, around 40 per cent of Australian bond transactions were cleared through the service (RBA 2015b); however, in July that year, the service was suspended due to the combination of the relatively small size of the market and a number of key market participants not using the service.

Against this backdrop, the growth in the Australian bond market over recent years is one consideration pointing to a strengthened case for centrally clearing the Australian bond market.

**The Australian bond market has become more international**

Growth in the size of the Australian bond market has attracted a greater range of participants. This expansion increases the complexity associated with the bilateral network of counterparties that must clear and settle their transactions. A particularly strong trend has been the increased involvement of non-residents, which currently hold over \$350 billion of AGS on issue, up from around \$200 billion in 2015 (Baker, Miller and Rankin 2021). Non-residents have also become much more heavily involved in the repo market, doubling their share of the stock of transactions outstanding since 2015 to around 50 per cent (Graph 1).

Non-resident investors typically access the Australian bond market through a different range of intermediaries compared with those used by residents. One example of this is the use of international central security depositories (ICSDs) to

hold and settle debt securities transactions. The ICSDs help to facilitate access to the Australian securities markets for international investors. They do this by linking to the domestic facility, Austraclear, where most Australian debt securities are held. However, the use of these intermediaries results in a more complex network of bond market participants (discussed further below).

**The Reserve Bank’s participation is no longer critical to the viability of a CCP**

The outright and repo markets for bonds are very important for the implementation of monetary policy. From 2020 to early 2022, the Reserve Bank increased its ownership of bonds in order to further ease monetary policy conditions. Over the same period, the Reserve Bank’s repo transactions declined and no longer represent a large share of the repo market. Overall, as the private market has grown, the Reserve Bank’s participation is no longer as critical to a CCP’s viability as was previously the case. While it is possible that the Reserve Bank’s operations in the bond market change in the future, it should be noted that central banks internationally are typically not participants in bond and repo market CCPs for their own currencies and do not use the CCP for monetary policy implementation.

Additionally, the experience internationally and in other domestic financial markets has shown that centrally cleared and non-centrally cleared markets can successfully coexist – an example in Australia is

the centrally cleared and non-centrally cleared markets for interest rate swaps.

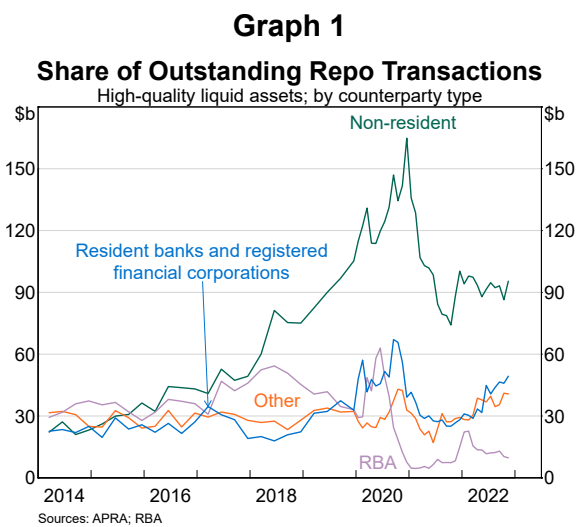
**Market participant support for, and experience with, CCPs has increased**

In liaison with the Reserve Bank, a number of dealers have expressed an appetite for reviewing the case for centrally clearing the Australian bond market. Among these firms, there is general support for a bond market CCP, reflecting the growth in the size of the market and number of participants, and the increased complexity resulting from the growing number of bilateral clearing arrangements.

The Reserve Bank’s liaison has also indicated that the benefits of a CCP, relative to its costs, are better understood by Australian market participants than in the past, including: operational efficiencies; standardisation of processes and contractual arrangements; and increased netting that would bring about capital savings and lessen balance sheet constraints. Firms have noted that growth in the bond market has outpaced the market capacity to warehouse bonds (where an entity stores bonds on its balance sheet for a period of time) and that central clearing could help to alleviate this constraint.

The greater understanding of the costs and benefits of a CCP among Australian market participants is due in part to the increased use of CCPs for other products and in overseas bond markets.<sup>[3]</sup> Many international jurisdictions now have CCPs for bond market transactions, including Canada, Japan, Europe, the United Kingdom and the United States (New York Fed 2019).<sup>[4]</sup>

It has also been noted in liaison that there is currently very little buy-side participation in the Australian repo market and that overseas repo CCP access models have resulted in increased participation from buy-side firms. Buy-side firms – such as hedge funds, mutual funds and pension funds – typically buy securities for money management purposes or as an investment. Further, under certain conditions there could be wider benefits for market functioning and resilience (see discussion below).



## Costs of central clearing

Should there be central clearing in the Australian bond market, market participants would face both set-up costs in joining a CCP, along with other financial costs, including the following:

- **Fees to the CCP** are paid by participants in return for the CCP's service.
- **Default fund contributions** are paid by CCP participants to cover losses incurred in excess of initial margin (financial resources paid to cover potential future changes in the value of a participants' position) when closing out a defaulting participant's positions. Outright bond and repo transactions are relatively low risk and as such the default fund at a bond market CCP is likely to be small, particularly in comparison with a CCP clearing equities.
- **Variation margin** covers changes in the value of a participant's positions resulting from changes in market prices. It prevents the build-up of current exposures. In the bilateral market, it is only used for some repo market transactions. As such, the cost to participants joining a CCP is likely to be similar for some but increase for others.
- **Initial margin** covers a CCP's potential future exposures on a participant's positions in the event the participant defaults. Some participants already pay an equivalent to initial margin in the bilateral repo market in the form of a haircut on the value of the collateral. As such, there may only be a change in this cost for some participants (Carter and Cole 2017).

However, the costs of joining a bond market CCP are expected to be relatively small when compared with other markets due to the low-risk nature of the products.

## Potential benefits of central clearing

One of the main benefits of CCPs is that they enable firms to net their exposures with all other counterparties.<sup>[5]</sup> This is referred to as multilateral netting and is described in Figures 1 and 2 above. It can create firm- and system-wide benefits, which are outlined below.

## Improved operational efficiency

In a centrally cleared bond market, multilateral netting can increase operational efficiencies for participants. This is possible because the number and value of transactions that each counterparty must process and settle may be lower than in a bilaterally cleared market that has no netting.

These benefits can be illustrated by comparing transactions that would be settled under bilateral and centrally cleared arrangements. Taking a single AGS bond on one day in 2021, there were 64 outright transactions among 20 counterparties (Table 1). In this particular security on this one day, two counterparties conducted multiple transactions (Y and Z), while several counterparties, including W and X, only had one transaction.

In a bilateral market with no netting, all 64 transactions would have to be settled individually. If the market were centrally cleared, each counterparty would settle only one transaction – the net of their purchases and sales. The number of transactions Y and Z must settle is significantly reduced. As W and X only had one transaction each and therefore no possible offsetting transactions, they do not receive operational benefits from central clearing for this security on this day. Two participants had perfectly offsetting transactions – same value of purchases and sales – of this security on this day and would have had no net settlement obligation.

## System-wide liquidity benefits from multilateral netting

These firm-level netting benefits, aggregated across all participants and securities, leads to a reduction in the amount of cash and securities required in the market to effect settlement, which can reduce the size of positions held on firms' balance sheets.

In a bilaterally cleared market with no netting or payment sequencing, each counterparty would need to fund its gross settlement obligations, which is the sum of all purchases and sales in each security. In a centrally cleared market, a counterparty only needs to fund its net settlement obligation because its purchases and sales in the same security, on the same day, have been netted.



**Table 1: Reduced Trades Improve Operational Efficiency<sup>(a)</sup>**

Counterparty	Bilateral market Count of settlements	Centrally cleared market Count of settlements	Bilateral market Value (\$billion)	Centrally cleared market Value (\$billion)
W	1	1	0.09	0.09
X	1	1	0.02	0.02
Y	26	1	0.82	0.29
Z	15	1	0.82	0.16
Aggregate market	64	18	2.58	1.30

(a) AGS data on a selected day in 2021. Only selected counterparties shown.

Sources: ASX; RBA

A comparison of gross and net settlement obligations for debt securities settled in Austraclear (the Australian securities settlement facility) over a 12-month period to late November 2021 indicates net settlement obligations would have been around 60 per cent lower. This amounts to a reduction of around \$60 billion per day, on average, in the amount of cash and securities that participants would need to make available for settlement if all debt securities transactions in Austraclear were centrally cleared (Graph 2).<sup>[6]</sup>

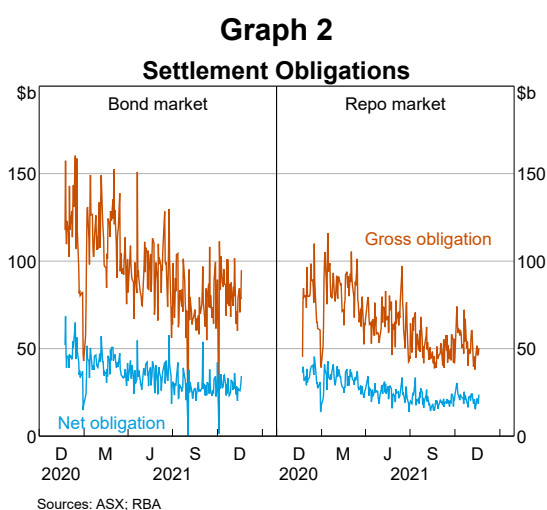
The liquidity netting benefits in the Australian bond market are calculated with an assumption that there is no sequencing of trades or netting present in the bilateral market. However, it is known that these arrangements do exist in the market. Therefore, the liquidity netting benefits calculated may overstate the benefits of moving from a bilateral to a centrally cleared market structure in Australia. However, the bilateral netting benefits of

interbank participants are approximately half of the possible multilateral netting benefits from central clearing (see discussion below). Further, the estimate of potential netting benefits is calculated using only Australian dollar denominated debt securities settled in Austraclear. There is also a material share of Australian dollar denominated debt securities settled outside Austraclear that could also be centrally cleared by a bond market CCP.<sup>[7]</sup>

### Netting benefits increase with trading volume

Netting benefits are greatest on days when there is a high volume of transactions that need to be settled, as there are typically more opportunities for offsetting transactions. In a bilateral market in which participants must fund and settle each transaction, operational and financial risk management balance sheet constraints are more likely to be binding on high-volume days. This is because there are more transactions occurring on these high-volume days and as such there is more financial and operational risk to protect against, which results in increased use of participants' balance sheets. As the trading volume increases, so too do the average netting benefits. The maximum potential netting benefit increases to over \$80 billion on days in the 90th percentile of trading volume (Graph 3).

High-volume days tend to be correlated with higher volatility in markets. While causation between activity and volatility can occur in either direction, increased balance sheet capacity to warehouse and facilitate transactions among interbank participants is likely to dampen volatility.<sup>[8]</sup>



### System-wide operational benefits and reduced settlement failures

The greater the number of transactions that must be settled in a bilateral market, the greater the number of dependencies – that is, one counterparty requires delivery of a bond from another counterparty in order to deliver it to a third counterparty. These dependencies are referred to as settlement chains or circles in securities markets. A settlement chain entails a chain of securities transactions among three or more counterparties involving the purchase and sale of a single security on a single date. A settlement circle is an extension of a settlement chain where the same security is due to pass between several participants on the same day without a clear start or end point.

In a bilateral market with no netting, settlements of transactions in a chain or circle would typically need to occur in a sequence such that all parties must have and deliver the securities. If one of the counterparties is unable to fulfil its obligation, this has the potential to result in a settlement failure of other transactions further through the chain or circle.

As the Australian bond and repo markets have grown and become more international, the complexity of the clearing and settlement processes for these securities has increased. Settlement chains or circles in the Australian bond market occur frequently.

A settlement failure occurs when a counterparty to a transaction fails to deliver all or part of the cash or

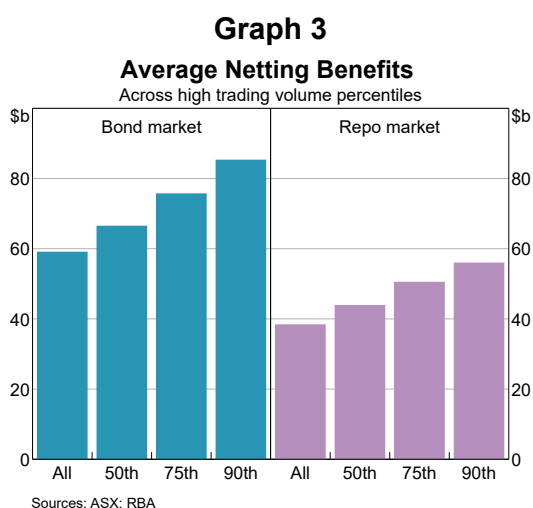
security they have contracted. The maximum exposure to settlement fails can be reduced through central clearing. In the above example, if one of the counterparties (Y) with the largest bilateral settlement exposures in this security on this day were to default, it would result in an exposure of \$0.82 billion. Under central clearing, this could be reduced to \$0.29 billion (Table 1).

Settlement failures are not common in the Australian bond market because counterparties instead facilitate settlement by borrowing securities in the market or from the Reserve Bank (Aziz and Jackman 2022). While providing a useful backstop mechanism, this step adds complexity to the facilitating of bond and repo market transactions. A central clearing facility would net obligations across counterparties prior to settlement, reducing the frequency and amount of securities that counterparties on aggregate would need to borrow. Central clearing could further reduce the already low number of failures, as well as the potential for a single transaction failure to have a systemic impact, and could improve market efficiency.

### Lower credit risk exposures and capital requirements

For participants in a CCP that are banks, the reduction in operational, credit and liquidity risks leads to lower capital requirements than if the transactions were not centrally cleared. The reduction in credit risk is a result of the removal of a firm’s direct exposures to multiple counterparties, replaced with a single net exposure to the CCP. As credit risk is reduced, it frees up space on firms’ balance sheets, which makes it less likely that capital and other constraints limit the capacity of participants to transact in the markets.

However, market participants have noted that reduced credit risk is not seen as a significant benefit of central clearing in bond and repo markets. This is because the credit risk exposures for bond and repo market transactions is not high. Bond market transactions typically settle two days after a transaction occurs, while repo transactions, by definition, are well collateralised. It is estimated that there will be a capital benefit from central clearing compared with bilateral clearing, but the



benefit is expected to reduce once Basel III regulations are implemented in 2023.

### Potential benefits to market resilience

Reforms to the OTC derivatives markets, including increased central clearing, in the wake of the GFC have been widely acknowledged to have made the financial system more resilient. Increased central clearing has standardised risk management, including: the use of margin to manage risk and coordinated default management; a more complete and less complex/segmented hub and spoke network of participants; and reduced exposures and potential for contagion through multilateral netting. It is worth noting that central clearing reduces contagion in the event of participant defaults; however, as the market is more concentrated around the CCP in this model, should the CCP itself default there could be major flow-on effects.

In assessing whether a market is suitable for central clearing, it is likely that the resilience benefits are larger for products that are widely traded and give rise to large exposures when not centrally cleared. Growth in the size of the Australian bond and repo markets naturally increases the potential benefits to centrally clearing these markets. The increased internationalisation of these markets through the greater participation of non-residents and the greater use of ICSDs has also contributed to a more complex network of bilateral relationships that could benefit from moving to a simplified hub and spoke model.

Evidence from the OTC derivatives markets suggests that moving towards central clearing can increase the liquidity of a market (Slive, Witmer and Woodman 2012; BlackRock 2018). It is also possible that centrally clearing the Australian bond market would increase market liquidity, particularly in AGS.

#### Case study: Lehman Brothers default in Japan

In Japan, the default of Lehman Brothers in 2008 led to greater use of central clearing in the Japanese Government bond (JGB) market. Prior to the Lehman Brothers default, there was modest participation in the JGB market CCP. Banks were already netting transactions bilaterally and did not realise large additional netting benefits or

efficiencies from joining the CCP. However, the benefits of central clearing beyond netting and efficient settlement were apparent to participants.

At the time of default, Lehman Brothers had a large value of trades yet to settle in the JGB bilateral market. As a consequence of Lehman Brothers' failure to settle these transactions, there were chains of settlement failures that took weeks to resolve.

This disruption was greater and took longer to resolve in the bilateral JGB market than in the centrally cleared JGB market where Lehman Brothers was a participant (Sato 2014; Bank of Japan 2009). Participants of a CCP are required to provide financial resources, including initial margin, proportional to their risk exposure. The CCP can draw upon these resources to cover any exposure or losses in the event of a default. Should a default occur, the netting provided by a CCP would have likely already decreased the overall exposure compared with the default occurring in the bilateral market. In the centrally cleared market, all losses incurred during the Lehman Brothers default were fully covered by its initial margin (IMF 2012).

Further, when Lehman Brothers failed to fulfil its obligations, participants in the CCP did not experience the flow-on effects to other trades that the bilateral market did, as the CCP took on those obligations. Surviving participants are better protected against replacement cost risk, which is the potential loss incurred from market movements should a participant need to close and re-establish its position because the original counterparty defaulted. The CCP was able to meet the obligations it assumed from Lehman Brothers to all non-defaulting participants.

After the Lehman Brothers default, there was a move by participants towards the cleared market. In comparison with the bilateral market, a CCP offers the additional benefit of coordinated default management processes. A CCP has predefined rules and procedures that participants agree to prior to joining the CCP that can contribute to more orderly market conditions in the event of a participant default, as it did during the Lehman Brothers default.<sup>[9]</sup>



## What affects the viability of a CCP?

A challenge that CCPs face is to incentivise a set of counterparties to join the CCP that will yield sufficient benefits from the central clearing market structure. The potential benefits are influenced by the network that the CCP can construct, including both the scope of products and participants. For example, the potential liquidity netting benefits noted above can only be achieved if all participants join a CCP.

While some countries have been able to develop successful bond market CCPs without mandates, others have encountered difficulty. As noted above, a reduced level of participation in the US debt securities CCP has led the SEC to propose mandated central clearing for all US Treasuries purchases and sales between a clearing member and registered broker-dealers, government securities brokers, dealers or hedge funds so that greater benefits can be realised (SEC 2022). Mandates were also used in developing central clearing in OTC swaps.

## Participants face different incentives to join CCPs

The netting benefits from joining a CCP fall unevenly across participants. This may result in a lower incentive for some participants to join, even though there are potentially large system-wide benefits. Possibly reflecting these considerations, participation in bond market CCPs has been variable in jurisdictions where they exist.<sup>[10]</sup>

Participants with the most offsetting trades will have the greatest netting benefits. In the analysis of Australian bond market (outright and repo) settlements in Austraclear, the top 20 participants are all interbank participants and would receive 98 per cent of the potential netting benefits (Table 2). Participants with fewer offsetting trades receive much smaller benefits. However, for the larger participants to realise the full netting benefits, participants with smaller potential benefits must also join the CCP.

**Table 2: Cumulative Share of Netting Benefits**

Participant	Cumulative share Per cent
Top 3 participants	40
Top 5 participants	58
Top 10 participants	83
Top 15 participants	93
Top 20 participants	98
All 101 participants	100

Sources: ASX; RBA

There are different trade-offs between the costs and benefits to less active trading participants or those with directional portfolios. While these participants would receive small to no netting benefits, joining a bond market CCP would expand the pool of counterparties smaller participants could easily transact with to include all other participants in the CCP, and reduce frictions such as bilateral agreements. In this way, central clearing can facilitate all-to-all trading, which tends to result in improved market liquidity. In a bilateral market, smaller participants would face insurmountable costs in setting up the legal agreements and operational arrangements required to transact with every other market participant. Participation in a CCP could increase the network for smaller participants, reducing the segmentation among market participants, and would likely increase competition for transactions, improve pricing and add depth to the market. Some overseas bond market CCPs have developed sponsored access models that cater for participants with lower levels of activity.<sup>[11]</sup>

## Netting across products and settlement facilities increases the benefits

The benefits of using a CCP are also dependent on the number of products that are eligible to clear. If a CCP were to operate for only the Australian dollar repo market that is settled within Austraclear (and not for the outright bond market), the overall netting benefit would drop to around \$40 billion per day on average. Allowing for cross-netting the settlement obligations of outright bond and repo

transactions increases the aggregate benefit in nominal terms by \$20 billion per day (Graph 3).

A CCP in the Australian bond market would also yield greater benefits if it netted transactions that took place in the ICSDs as well as Austraclear.

**Netting benefits are impacted by the market structure**

It is likely that not all of the activity in the bond and repo markets would be cleared through a CCP should one be set up. A more likely outcome is for a bond market CCP to realise only part of the maximum potential netting benefits. The following scenarios highlight the importance for any CCP to acquire participation from active counterparties, particularly those in the interbank market, in securities where there is a high level of activity (Graph 4):

- **Maximum benefit:** A bond market CCP clears all products and all potential counterparties join the CCP.
- **Interbank market:** Around 80 per cent of the maximum benefit is realised if 22 interbank market participants clear all of their outright and repo transactions.
- **AGS only:** Around 80 per cent of the maximum benefit is realised if only outright and repo transactions in AGS are centrally cleared.
- **Combined:** Around 70 per cent of the maximum benefit is realised if all outright and repo AGS transactions are centrally cleared by the 22 interbank participants that account for 90 per cent of activity.
- **Excluding a large participant:** The benefits of a bond market CCP are highly dependent on large participants joining. If a single large participant did not join the CCP, the aggregate netting benefit of using one would drop dramatically.

**Bilateral netting benefits are lower than multilateral netting**

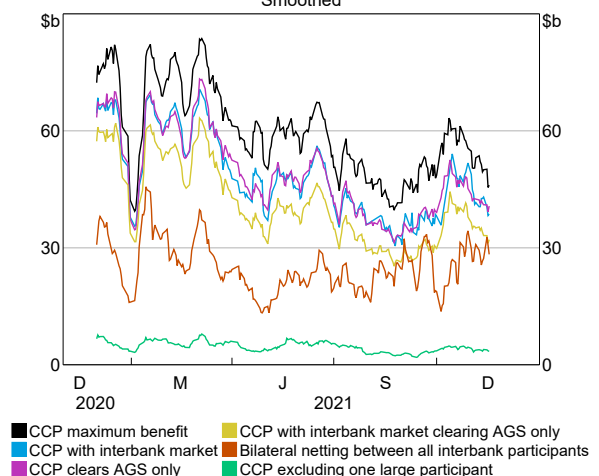
Some market participants have suggested that much of the benefit of multilateral netting from a CCP can also be achieved through bilateral netting. Our comparison of the bilateral and multilateral

netting benefits for 22 interbank participants indicates that around half of the netting benefits of a CCP could be realised through bilateral netting (Graph 4). For these to be realised, the 22 interbank participants would need to have bilateral netting arrangements with every other counterparty. Depending on the participant, this may be more or less costly than joining a CCP. A limitation of bilateral netting is that it is less likely to reduce issues arising from settlement chains or circles.

**Next steps**

The introduction of a CCP in the Australian bond market would entail costs and benefits. Overall, the public policy case for central clearing in the Australian bond and repo markets is stronger than in 2015 when the Reserve Bank last considered the case. However, the Reserve Bank intends to engage further with market participants on this topic to ensure that a wide range of perspectives are considered. One area that will be discussed is whether a potential Australian bond market CCP provider should be located in Australia, which has previously been the Reserve Bank’s view (RBA 2015a). Other areas of focus will be the incentives faced by different types of participants for joining a CCP and the interaction of financial stability issues and business case considerations as they relate to potential operators, market participants and the broader financial markets industry. ✎

**Graph 4**  
**Netting Benefits Under Different Scenarios**  
 Smoothed



Sources: ASX; RBA

## Endnotes

- [\*] The authors are from Payments Policy Department and would like to thank Bradley Jones, Ellis Connolly, Adam Cagliarini and Richard Finlay for feedback and Mia Pahljina for contributing analysis.
- [1] This article does not address all of the requirements for introducing a CCP outlined in World Bank (2022).
- [2] See, for example, Brainard (2021); FIA PTG (2021); DTCC (2021); Chaffee and Schulhofer-Wohl (2021); Brookings (2021).
- [3] In the context of a CCP, a participant is a direct member of the CCP and not a client of a participant.
- [4] In Europe and the United Kingdom, LCH's RepoClear services clear euro and sterling denominated repo trades; in the United States, FICC operates the Government Securities Division that centrally clears US Treasuries.
- [5] For a general discussion of the costs and benefits of CCPs, see RBA (2015b).
- [6] The liquidity netting benefits have been calculated using a similar methodology to Fleming and Keane (2021). See also Ziqing Chen *et al* (2022).
- [7] Both Clearstream Banking and Euroclear Bank settle Australian dollar denominated securities; some banks may also provide settlement within their own books.
- [8] For a discussion on the effect of dealer business models on liquidity in fixed income markets, see Cheshire (2016).
- [9] For example, the default rules in place at RepoClear (2022) (bond clearing service in the United Kingdom and Europe) and the Government Securities Division of FICC (2022) (US bond clearing service).
- [10] For example, in the United States, in 2017 only 13 per cent of Treasury transactions were centrally cleared.
- [11] See, for example, RepoClear (2023); FICC (2023). For a discussion of sponsored clearing, see BIS (2021).

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