

# The Effective Supply of Collateral in Australia

Belinda Cheung, Mark Manning and Angus Moore\*

High-quality assets play an important role as collateral for a wide range of transactions and activities in wholesale financial markets. Regulatory changes since the global financial crisis are increasing the demand for high-quality assets, thereby raising concerns about possible collateral shortages. This article attempts to quantify the ‘effective’ supply of collateral assets in Australia by using a measure of supply that adjusts outstanding issuance for two important features of the collateral market. One feature is that a large proportion of Australian high-quality assets is held by long-term investors that do not make these assets available for sale, loan or use in repurchase agreements. A second feature is the ability to re-use collateral assets, thereby allowing a single piece of collateral to meet multiple demands. Using a new survey that adjusts for these features, the current effective supply of Australian government debt for collateral purposes is estimated to be around \$128 billion, comprising around \$80 billion of active supply that is re-used on average 1.6 times. This amount would appear to be sufficient to support current demand for collateral.

## Introduction

Fundamental changes are under way in the functioning of wholesale financial markets. These are driven in part by regulatory reforms since the global financial crisis, as well as by behavioural changes in response to lessons learned during the crisis. One important change has been an increased emphasis on high-quality assets, both within the regulatory framework and in market conventions and practices. A range of new regulations, such as those that require banks to maintain higher levels of liquidity and those that promote increased collateralisation in derivatives markets, are likely to increase market participants’ demand for high-quality assets substantially.

These changes have raised concerns about localised collateral shortages. The focus of most studies of collateral supply and demand to date has been the

level of outstanding issuance of high-quality assets. But it is important that policymakers and market participants understand the extent to which some of these assets are held by investors that do not make them available to meet collateral demands. They also need to consider how changes in regulation and market practices could alter the way that collateral assets circulate through the system. Adjusting for these factors will deliver an estimate of the ‘effective’ supply of collateral assets.

This article focuses on the use of high-quality assets for collateral purposes. It first introduces the role of collateral in financial markets and describes some of the changes occurring. With particular reference to Australia, it examines current and potential future developments in collateral use and considers the effective supply of high-quality collateral assets to meet current and future demand. To better understand the functioning of collateral markets in Australia, and to help to quantify the current effective supply of collateral assets, the RBA surveyed the 20 largest securities dealers in Australia on their institutions’ collateral market activity.

\* Belinda Cheung is from Domestic Markets Department, Mark Manning is from Payments Policy Department and Angus Moore is from Economic Research Department. The authors would also like to acknowledge the valuable input to this article from a number of colleagues, and in particular Matthew Boge and Nicholas Garvin.

## Collateral Use in Wholesale Markets

The basic role of collateral is to manage counterparty credit risk. Several typical attributes of collateral make it an effective tool for doing so. Collateral provides reliable and timely protection in the event of a default and provides a senior claim in bankruptcy. Compared with an unsecured exposure, collateral alleviates the information asymmetry between the borrower and lender regarding the borrower's creditworthiness, because the lender's principal interest is in the quality of the collateral. Relatedly, collateral helps to align the incentives of borrowers and lenders: unsecured borrowers may have an incentive to take riskier decisions since the risk is ultimately borne by the lender; secured borrowers, by contrast, risk losing their collateral.

Accordingly, collateral assets in wholesale markets are typically of high quality – that is, assets with low credit, market and liquidity risks – so they would be expected to retain their value and could be liquidated on a timely basis should the counterparty default. For instance, repurchase agreements (repos), the most common form of collateralised lending in wholesale markets (see 'Box A: The Legal Basis for the Exchange of Collateral'), are typically contracted against a defined set of high-quality assets. In Australia, most repos are contracted against 'general collateral', which includes Commonwealth Government securities (CGS) and securities issued by the states and territories ('semi-government' securities). Currently, around 85 per cent of repos outstanding are backed by government-related securities and most repos have maturities of less than 14 days.

The repo market is the most significant venue for the exchange and circulation of high-quality assets in the domestic financial market, and it plays an important role in institutions' funding and liquidity management activities. Active participants in the domestic repo market include securities dealers – typically large domestic and international banks that are market makers in domestic government

securities – as well as some smaller institutional non-dealer participants and the RBA (Wakeling and Wilson 2010). Two of the most significant areas of repo market activity in Australia are:

- *RBA operations.* Repos offer a flexible instrument for the RBA to manage the total amount of outstanding Exchange Settlement Account (ESA) balances in the banking system so as to keep the cash rate as close as possible to the target set by the Reserve Bank Board. By executing repos with its counterparties, principally as a cash provider, the RBA manages the aggregate of institutions' ESA balances. As at August 2014, repos with the RBA accounted for around 30 per cent of outstanding repo market positions.<sup>1</sup>
- *Market making in government securities.* Securities dealers are major participants in the Australian repo market. As market makers in domestic government securities, dealers match buyers and sellers of the same security, or – when timing mismatches arise – buy and sell for their own account. The repo market facilitates this activity. In particular, dealers are able to fund their inventory of securities by selling them under repo. Selling securities under repo allows dealers to raise funding without having to liquidate outright positions; alternatively, a dealer can source funding internally from its treasury desk. The principal provider of cash to the Australian repo market is the RBA. Dealers may also use repos to borrow securities they have agreed to sell to their customers. Much of this activity – around 20 per cent of outstanding repo positions – occurs between securities dealers. Investment funds and other non-dealer institutions are also providers of securities to securities dealers. These institutions typically use repos to manage their short-term funding without selling their high-quality assets outright.

<sup>1</sup> This excludes banks' 'open repos' with the RBA for the purpose of meeting settlement obligations.

Securities lending activity also supports the circulation of high-quality assets in wholesale markets. While in many ways similar to repo activity, securities lending is typically driven by the need to hold a particular security – often to meet a margin requirement or to cover a short sale or a failed settlement. Loaned securities are usually sourced from investment funds or superannuation funds. These funds typically operate via custodian banks that act as securities lending agents. In the Australian securities lending market, most loaned securities are equities, with only around a third of securities loans involving fixed income securities (Markit 2013). Loans may be collateralised by cash or other non-cash assets (subject to a haircut). Securities lending agents then reinvest cash collateral received.

Clearing via central counterparties (CCPs) is another source of collateral demand. CCPs help to manage counterparty credit risk in a wide range of markets, including equity, fixed income and, increasingly, over-the-counter (OTC) derivatives markets (see section below).<sup>2</sup> To manage the financial exposure it assumes in carrying out its function, a CCP collects collateral from its participants: variation margin, to cover observed changes in the mark-to-market value of participants' open positions; and initial margin, to manage potential future price changes before an exposure to a defaulted participant's position can be closed out. CCPs also typically collect collateral from participants to fund a buffer of pooled financial resources in case a defaulted participant's margin proves insufficient.

The collateral used to meet CCPs' margin requirements may take the form of cash or non-cash assets. Variation margin is generally always met in cash, since it is typically passed through from the participant with a mark-to-market loss to the participant with a gain. Initial margin requirements, on the other hand, may be met using cash or

high-quality assets.<sup>3</sup> In Australia, cash is commonly posted to meet initial margin requirements at the two domestic CCPs (ASX Clear and ASX Clear (Futures)).<sup>4</sup> In the year to the end of June 2014, on average, 57 per cent of initial margin obligations at ASX Clear were met with non-cash assets, primarily liquid equities; at ASX Clear (Futures), only 2 per cent were met with non-cash assets.

Collateral can also be exchanged between counterparties to non-centrally cleared OTC derivative contracts. To date, this has typically involved only the exchange of variation margin. Initial margin has not been widespread, although this is changing (see section below).

## The Increasing Demand for High-quality Assets

Non-regulatory demand for high-quality assets has been increasing as investors have shifted towards more collateralised lending. However, recent and upcoming regulatory changes are also driving an increase in the demand for high-quality assets for both collateral and non-collateral purposes (Heath and Manning 2012).

### Increased demand for collateral purposes

The most significant regulatory changes relate to the way counterparty risk is managed in the OTC derivatives market. While central clearing has long been a source of collateral demand, the range of products covered by CCPs' activities is expanding. Since the global financial crisis, the move to central clearing of OTC derivatives has accelerated following the G20's commitment in 2009 to ensure that all standardised OTC derivatives are centrally cleared. Mandatory central clearing of certain interest rate

2 A CCP stands between the buyer and seller in a financial market transaction. The CCP guarantees that if one party was to default on its obligations to the CCP, the CCP would continue to meet its obligations to the other.

3 Recently introduced international standards clarify requirements around the size and composition of CCPs' pooled financial resources, and also set expectations around eligible non-cash collateral and the reinvestment of cash collateral (CPSS-IOSCO 2012). The Australian Securities and Investments Commission and the RBA have implemented these standards in Australia.

4 ASX Clear provides CCP services for equities and equity options; ASX Clear (Futures) clears exchange-traded futures and OTC derivatives.

## Box A

## The Legal Basis for the Exchange of Collateral

There are several mechanisms by which collateral is exchanged in financial markets. The particular mechanism used may have implications for the rights and obligations of contracting parties and also for how collateral assets then flow through the system.

- *Repo.* Under a repo contract, one party sells a security to another at a price today, committing to repurchase that security at a specified future price and date; the difference between these prices reflects the interest rate paid by the securities provider to borrow cash. Legal title to the collateral passes to the cash provider for the duration of the repo agreement, while the economic benefits are retained by the securities provider. Since legal ownership of the security is transferred, the cash provider has an automatic right to re-use the securities. Repo transactions are generally agreed under industry standard documentation, typically the Global Master Repurchase Agreement. The master agreement governs the transaction, establishing the rights and obligations of the contracting parties.
- *Securities lending.* In a securities lending transaction, legal title to the security is transferred from the lender to the borrower for a specified period of time in exchange for collateral and in return for a fee. Economic benefits reside with the securities borrower. In many ways, where a securities loan is supported by cash, the transaction is economically equivalent to a repo. Securities lending transactions are, however, governed by different industry standard documentation. In Australia, securities lending transactions are typically governed by the

Australian Master Securities Lending Agreement. This documentation details matters such as the lender's right to recall the securities and any voting rights attached to the loaned security.

- *Security interest.* The mechanism for securing derivatives transactions differs among jurisdictions. However, a common approach is to grant a security interest over collateral assets. As an example, a pledge is a type of security interest under which the security giver, the pledgor, creates an interest over the collateral in favour of the security taker, or pledgee. The pledge agreement may impose certain duties, conditions and restrictions on the pledgee's use of the collateral. For example, since the pledgee only has a partial and limited security interest, collateral may need to be held in a segregated account. It is often the case that the pledge is governed by a bilateral contract between the pledgor and pledgee.

The term 're-use' covers a broad category of transactions, where securities delivered as collateral supporting one transaction are then used to collateralise another transaction. The term 'rehypothecation', a form of re-use, is used in a narrower context to refer to the right of a financial intermediary to sell, pledge, invest or perform other transactions using a client's assets.

As discussed later in this article, whether or not collateral is re-used is important for how high-quality collateral assets circulate through the system. In particular, this has implications for the 'effective' supply of collateral assets.

and credit derivatives is already in place in some jurisdictions, including the United States. And, under the Basel bank capital regime, there are incentives to centrally clear derivative positions. Almost two-thirds of the outstanding value of interest rate derivatives globally (the largest segment of the OTC derivatives market) is therefore now centrally cleared. Since non-centrally cleared trades typically did not previously involve either side posting initial margin, the transition to central clearing has been accompanied by an increase in the demand for, and use of, high-quality assets.<sup>5</sup> In Australia, in response to recommendations from the Australian Prudential Regulation Authority (APRA), the Australian Securities and Investments Commission (ASIC) and the RBA, the government has consulted on a proposal to adopt mandatory clearing for interest rate derivatives denominated in the major currencies and the Australian dollar (Australian Treasury 2014).

The proportion of non-centrally cleared derivatives transactions that is collateralised, at least with variation margin, has also increased significantly over the past decade. This has occurred both in Australia and internationally, particularly since the global financial crisis. A recent survey by the International Swaps and Derivatives Association reports that, globally, around 90 per cent of non-centrally cleared transactions in credit, fixed income and equity derivatives are subject to a collateral agreement (ISDA 2014). From December 2015, collecting both variation and initial margin on non-centrally cleared transactions will become a mandatory requirement globally for transactions between certain counterparties. The government, in consultation with APRA and ASIC, is considering how these requirements may be implemented in Australia.

## Increased demand for non-collateral purposes

At the same time, regulatory changes are increasing the demand for high-quality assets for purposes other than collateral requirements. Such competing demands are relevant for the availability of high-quality assets to meet institutions' collateral needs. In particular, the Liquidity Coverage Ratio (LCR) introduced under the Basel III reforms requires that banks hold an amount of specified high-quality assets sufficient to withstand 30 days of outflows in stressed market conditions. In the Australian context, APRA has defined these high-quality 'liquid' assets (HQLA) to comprise reserve balances with the RBA, CGS and semi-government securities. Banks have already begun to adjust their high-quality asset holdings in anticipation of the regulations formally taking effect in 2015. The share of liquid assets on Australian banks' balance sheets has risen to more than 10 per cent of banks' total assets since the global financial crisis, with the proportion of these held in CGS and semi-government securities increasing from just 10 per cent to almost 45 per cent.<sup>6</sup>

## Estimates of increased demand for high-quality assets

There have been a number of attempts to quantify the implications of some of these regulatory developments for the demand for high-quality assets in a range of markets globally. Estimates of the implications of central clearing and margining of non-centrally cleared derivatives are sensitive to assumptions about the volatility of cleared products, the proportion of OTC derivatives trades that will eventually transition to central clearing, and the extent to which trades will be fragmented across multiple CCPs (Table 1). Several studies have emphasised the greater scope for collateral efficiency if trades are centrally rather than non-centrally cleared (Heath, Kelly and Manning 2013). These studies also

<sup>5</sup> In addition, the international standards for CCPs require segregation of client assets. These additional protections have the effect of increasing collateral demand, since they reduce the scope for netting against client positions.

<sup>6</sup> This is based on data for March 2014 from the Australian Bureau of Statistics, APRA and the RBA. In this context, the definition of liquid assets is wider than APRA's definition of HQLA.

**Table 1: Estimates of International Demand for High-quality Assets**

| Source                                  | Coverage                                                                                                                                                                         | Range of Estimates                                                                                                                                                                                                                   |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duffie, Scheicher and Vuillemeay (2014) | Subset of the OTC credit derivatives market: initial margin.                                                                                                                     | 4.5–8 per cent of net notional outstanding, depending on the market structure used. A number of alternatives are considered.                                                                                                         |
| CGFS (2013)                             | Global: LCR; initial margin for (centrally cleared and non-centrally cleared) OTC derivatives.                                                                                   | Estimated increase of US\$4 trillion.                                                                                                                                                                                                |
| Capel and Levels (2012)                 | Euro area: LCR; initial and variation margin for (centrally cleared and non-centrally cleared) OTC and exchange-traded derivatives; Eurosystem operations; repo market activity. | €4.7 trillion by the end of 2014. This reflects an estimated increase of €2 trillion between 2012 and 2014.                                                                                                                          |
| Heller and Vause (2012)                 | Largest 14 global dealers: initial margin for centrally cleared OTC interest rate and credit derivatives.                                                                        | Separate CCP for each asset class (high volatility scenario): US\$107 billion for credit derivatives; US\$43 billion for interest rate derivatives. The estimates vary significantly according to the chosen volatility level.       |
| ISDA (2012)                             | Global: initial margin for non-centrally cleared OTC derivatives across all asset classes.                                                                                       | US\$800 billion–US\$1.7 trillion in normal market conditions, with firms using internal margin models to calculate requirements.                                                                                                     |
| Sidanius and Zikes (2012)               | Global: initial margin for centrally cleared and non-centrally cleared OTC interest rate and credit derivatives.                                                                 | Between US\$200 billion and US\$800 billion, depending on the netting efficiency achieved by central clearing. This reflects an estimated increase of US\$130 billion to US\$450 billion from pre-reform levels of central clearing. |

Source: RBA

highlight the efficiencies of concentrating clearing in one CCP or a few CCPs, rather than clearing in several CCPs operating in different markets or products (Duffie and Zhu 2011).

The same factors will determine the magnitude of the increase in collateral demand associated with the clearing and margining of OTC interest rate derivatives in Australia.

The notional value of Australian dollar-denominated interest rate derivatives outstanding is around \$11 trillion, with Australian-headquartered participants accounting for around half of this amount. While the notional value outstanding is large, the increase in collateral demand arising

from clearing these derivatives may be relatively small.<sup>7</sup> Indeed, since most new trades are already being centrally cleared ahead of a mandatory requirement, the increase in demand has to an extent already been accommodated. Some participants, particularly non-dealers, may nevertheless face greater liquidity constraints. Non-dealers may also be more likely to have directional positions that cannot easily be netted. Accordingly, the Australian

<sup>7</sup> Most global OTC interest rate derivatives are currently cleared by the SwapClear service operated by LCH.Clearnet Ltd. SwapClear currently holds around US\$36 billion in initial margin against more than US\$200 trillion in notional outstanding exposures, suggesting an effective initial margin rate of less than 0.02 per cent. Even allowing for less netting efficiency or higher market risk in Australian market positions than the average in SwapClear, the effective margin rate may be relatively low.

regulators' recommendation to the government was that the proposed scope of mandatory central clearing requirements should not extend beyond internationally active dealers.

The proposed coverage of international standards for initial margining of non-centrally cleared derivatives may limit the ultimate effect on collateral demand in the Australian market. The largest segments of the currently non-centrally clearable component of the Australian OTC derivatives market are foreign exchange derivatives and cross-currency swaps. Heath and Manning (2012) estimate that if initial margin requirements were imposed on foreign exchange derivatives positions, the additional collateral demand in the Australian market could be as much as \$35 billion. An increase in collateral demand of this magnitude could impose costs and liquidity risks that would outweigh the benefits. Accordingly, consistent with treatment elsewhere, the RBA and ASIC argued that foreign exchange derivatives should be exempt from margining requirements under the international standards. These products were ultimately excluded from the scope of the new standards. Effective margin rates on positions in the other non-centrally clearable asset classes (credit, equity and commodity derivatives) will be much higher than for interest rate derivatives and the scope for netting potentially lower. However, Australian market positions in these asset classes are currently relatively small (APRA, ASIC and RBA 2014).

## The Effective Supply of High-quality Collateral Assets

While the range of estimates is quite wide, the studies in Table 1 have typically concluded that a global shortage of high-quality assets is unlikely. CGFS (2013), for instance, notes that while demand for high-quality assets could increase by an estimated US\$4 trillion as a result of regulatory changes, between 2007 and 2012 the supply of high-quality government securities increased by US\$10.8 trillion.

Nonetheless, it is acknowledged that while the total supply of high-quality assets is important,

the geographical distribution of that supply also matters. Localised shortages could arise. This may be particularly important for markets, such as Australia, that have a smaller supply of government debt outstanding. Furthermore, looking solely at the supply on issue will not fully capture the availability of high-quality assets to meet collateral needs.

The 'effective supply' of collateral is more indicative of both the availability of high-quality assets to support collateral dependent activities and the way these assets are used. Determining effective supply requires two important adjustments to a measure of the total supply of high-quality assets, with partially offsetting effects:

- *Active supply.* Many high-quality assets are 'locked away' in buy-and-hold portfolios and are unavailable for sale, loan or repo. They may alternatively be unavailable because they are held to meet certain minimum regulatory requirements. These assets may therefore be considered 'inactive' for collateral purposes.
- *Collateral re-use.* In many collateralised transactions, the collateral receiver has the legal right to re-use the collateral, particularly where the legal basis for provision of collateral is a transfer of title. Re-use allows a single piece of collateral to simultaneously support multiple demands and assists in intermediation between source providers of collateral assets and the ultimate users of those assets. The source provider of a collateral asset may be thought of as the starting point in a 'collateral chain', with the ultimate user the end point. For instance, CCPs do not typically re-use collateral received, other than in exceptional circumstances, such as the default of a clearing participant. While collateral re-use helps a participant in a CCP to access the collateral that it needs to meet the CCP's margin requirements (through, for instance, repo markets), the delivery of the collateral to the CCP is the end point in the collateral chain. Singh (2013) describes the important role of collateral re-use – which he terms 'collateral velocity' – in supporting wholesale financial market activity.



Securities dealers have traditionally relied significantly on their ability to re-use collateral received under repo from institutional investors for a range of activities, including: supporting their market-making activity in the government bond market; raising short-term funding and managing short-term liquidity needs; meeting other market participants' demand for high-quality assets; and matching repo or derivatives trades between clients.

Taking into account these two adjustments, the effective supply of collateral may be calculated by first subtracting the inactive component from the total supply of high-quality assets on issue to yield the 'active supply', and then multiplying this active supply by an estimate of the number of times that each piece of collateral is re-used on average:

$$\text{Active supply} \times \text{re-use of collateral} = \text{Effective supply}$$

where  $\text{re-use of collateral} = \frac{(\text{Total collateral use})}{(\text{Total source collateral})}$

Of course, even if there is sufficient effective supply of high-quality assets, accessing these assets may be more challenging or more costly for some institutions. For instance, where non-financial corporations or investors use derivatives markets only to hedge illiquid assets or future cash flows, increased collateralisation could be a source of liquidity risk (APRA *et al* 2014).

## The Effective Supply of Collateral in Australia

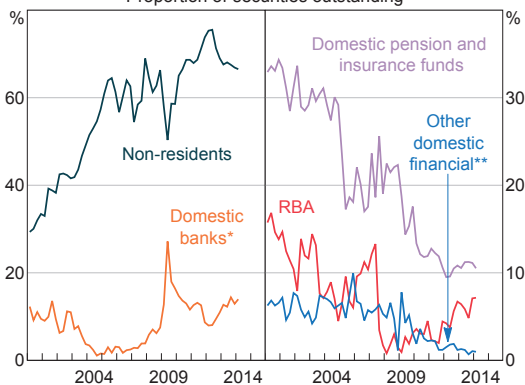
Applying the concepts introduced above, this section attempts to estimate the effective supply of high-quality assets to meet collateral demands in Australia. This analysis focuses on the highest quality collateral issued in Australia: CGS and semi-government securities. As noted, these assets are currently the most commonly used form of non-cash collateral in Australia. This section begins with a discussion of the holders of Australian

high-quality assets, which shows that a large proportion of Australian high-quality assets are held for non-collateral purposes and are not made available for collateral purposes. They are therefore not part of the 'active supply'. It then introduces data from a survey of Australian securities dealers' collateral market activity to help estimate the active supply of CGS and semi-government securities and the rate of collateral re-use.

## Holders of Australian high-quality assets

The majority of Australian high-quality assets are held by non-resident entities and domestic banks. The proportion of total CGS outstanding that is held by non-resident entities has grown substantially over the past two decades, to around two-thirds, or almost \$230 billion of the more than \$340 billion on issue, as at the end of March 2014 (Graph 1). Around 30 per cent of total issuance of semi-government securities, or more than \$80 billion, is also held by non-resident entities (Graph 2). These entities typically do not use these assets for collateral-related activities and generally do not make them available for such activities. As a result, a very large proportion of Australian high-quality assets are inactive for collateral purposes.

**Graph 1**  
 **Holders of Federal Government Debt**  
 Proportion of securities outstanding

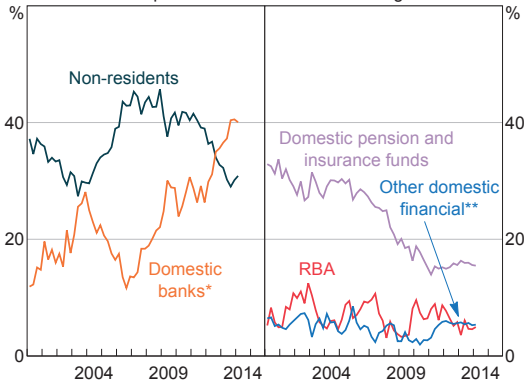


\* Includes other domestic depository institutions  
 \*\* Includes domestic investment funds

Source: ABS



**Graph 2**  
**Holders of State and Local Government Debt**  
 Proportion of securities outstanding



\* Includes other domestic depository institutions  
 \*\* Includes domestic investment funds

Source: ABS

As noted, domestic banks’ holdings of high-quality assets have risen markedly in recent years in anticipation of new liquidity regulations; banks’ holdings of CGS have increased over tenfold from June 2008 – just prior to the height of the global financial crisis – to almost \$48 billion, and their holdings of semi-government securities nearly fivefold to more than \$100 billion. Given the dominance of non-resident investors and domestic banks, other domestic private sector investors

(such as pension, insurance and investment funds) collectively hold only around 12 per cent of total issuance of CGS and around 20 per cent of semi-government debt.

**A survey of Australian securities dealers’ collateral use**

To better gauge the effect of the developments described in this article on the functioning of the Australian collateral market and to assist in estimating both active supply and the rate of collateral re-use, the RBA surveyed the 20 largest securities dealers in Australia on their collateral market activity as at June 2014. A particular focus was collateral re-use.

To the extent that most collateral market activity involving Australian high-quality assets is intermediated by major securities dealers, a survey of these entities should provide a reasonable estimate of collateral use and re-use in the Australian market as a whole. The survey sought a breakdown of dealers’ counterparties and also separately identified dealers’ activities using the highest quality general collateral (GC 1) (Table 2).

As Table 2 shows, a material proportion of the collateral used by dealers draws on assets that these institutions own outright. Consistent with data cited

**Table 2: Collateral Use and Re-use by Securities Dealers in the Australian Market<sup>(a)</sup>**  
 Outstanding positions, \$ billion, GC 1 securities,<sup>(b)</sup> June 2014

|                                                      | Other survey respondents | Institutional investors | Other banks | Central banks <sup>(c)</sup> | Total <sup>(d)</sup> |
|------------------------------------------------------|--------------------------|-------------------------|-------------|------------------------------|----------------------|
| Owned outright and pledged/repo’d/loaned to:         | 12.8                     | 2.9                     | 1.7         | 17.5                         | <b>35.0</b>          |
| Received as collateral from:                         | 20.7                     | 17.1                    | 11.7        | 0.3                          | <b>49.8</b>          |
| <i>Of which:<sup>(e)</sup></i>                       |                          |                         |             |                              |                      |
| Received as collateral and pledged/repo’d/loaned to: | 7.5                      | 1.9                     | 3.0         | 24.6                         | <b>37.1</b>          |

(a) Based on a survey of 20 securities dealers in the Australian repo market. Due to non response by some smaller entities, the reported numbers do not capture all collateral activity; as a result, the collateral received by survey respondents from other survey respondents does not balance exactly the collateral pledged/repo’d/loaned by survey respondents to other survey respondents.

(b) Includes actively traded CGS and semi-government bonds, Treasury notes and Commonwealth and state government indexed bonds; note that GC 1 assets are a subset of APRA defined HQLA, in that only actively traded CGS and semi-government securities are eligible for GC 1

(c) Includes the RBA and, to a small extent, foreign central banks

(d) Components may not sum to totals due to rounding

(e) Of total collateral received

Source: RBA

elsewhere (Wakeling and Wilson 2010), Table 2 confirms the high level of activity between securities dealers. Also, as expected, more than half of the collateral received by respondent securities dealers is provided by institutional investors and other banks, which includes securities lending agents acting on behalf of institutional investors. Table 2 also reveals that survey respondents used around \$42 billion in CGS and semi-government securities in June 2014 to support their participation in the RBA's operations.<sup>8</sup>

The survey additionally sought information on collateral activities using the broader second tier of general collateral (GC 2), which includes some non-government-related securities. By comparison with the data on GC 1 assets, the use of GC 2 assets as collateral is much lower (less than \$10 billion in total). This may reflect the tendency for haircuts on these assets to be higher. Of this, around \$6 billion was used to support central bank operations.

### Active supply of high-quality assets in Australia

Adjusting for the inactive component of the stock of high-quality assets may be particularly significant in the Australian context. This is because a large proportion of high-quality assets on issue is held overseas and understood to be held by long-term investors – largely official sector investors – that typically do not make their assets available for sale, loan or repo.

The survey data provide a basis for estimating how much of the outstanding supply of CGS and semi-government securities is currently 'actively used' as collateral – either under pledge, repo or a securities lending agreement. This is outlined in Table 3.

According to the survey data, banks and securities dealers currently actively use around \$47 billion of CGS and semi-government securities that they own outright. Institutional investors, such as

**Table 3: Holdings and Use of Australian Government Debt**  
'Holdings' data as at end of March 2014, 'actively used' data as at June 2014

|                              | \$ billion   | Holdings <sup>(a)</sup><br>Per cent of total<br>outstanding<br>securities | Actively used <sup>(b)</sup><br>\$ billion |
|------------------------------|--------------|---------------------------------------------------------------------------|--------------------------------------------|
| Banks and securities dealers | 155.9        | 25.5                                                                      | 46.7                                       |
| Institutional investors      | 95.6         | 15.6                                                                      | 17.1                                       |
| Non-residents                | 310.9        | 50.8                                                                      |                                            |
| Other <sup>(c)</sup>         | 49.7         | 8.1                                                                       | na                                         |
| <b>Total<sup>(d)</sup></b>   | <b>612.0</b> | <b>100.0</b>                                                              | <b>63.8</b>                                |

(a) Holdings refers to the securities held by the institution as at the reporting date. To the extent that securities have been pledged/ repo'd/loaned to the institution, these would be included in the holdings figures. Accordingly, these data do not capture the sources of actively used high-quality assets, but rather the final end points of collateral chains.

(b) The data are drawn from data in Table 2 on securities owned outright and pledged/repo'd/loaned by respondent securities dealers, and securities received as collateral by respondent securities dealers (other than from other respondent securities dealers). Note that the breakdown of institution types in the survey data does not match precisely the breakdown in the data on holders of high-quality assets. Also, data on active use by institutional investors may be higher, and those for banks and securities dealers correspondingly lower, to the extent that use by banks and securities dealers captures intermediation of collateral use by institutional investors (e.g. banks acting as securities lending agents for institutional investors).

(c) Includes RBA, federal, state and local government, and public and private non-financial corporations

(d) Components may not sum to totals due to rounding

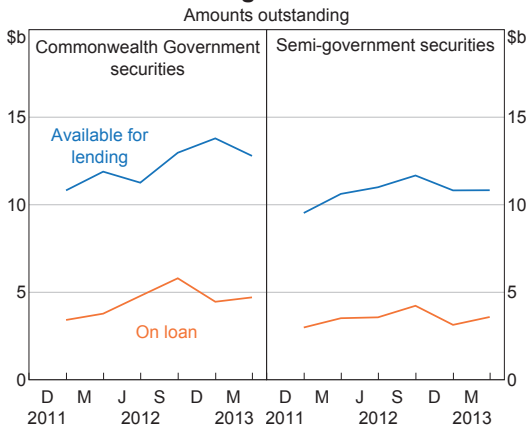
Sources: ABS; Data Explorers; Markit; RBA

<sup>8</sup> The sum of the first row and third row of the fourth column of Table 2.

superannuation or insurance funds, provide around \$17 billion of high-quality assets for collateral purposes. The current actively used supply is therefore around \$64 billion, which is small relative to the outstanding supply of these assets.

The actual available supply of high-quality assets is, however, greater than that which is currently actively used. This includes securities committed to securities lending programs that are not currently on loan. The utilisation rate of government securities committed to lending programs is only around a third (Graph 3). These committed, but unutilised, securities should also be regarded as part of active supply.

**Graph 3  
Securities Lending in Government Debt**



Sources: Data Explorers; Markit

Adding the unutilised component of securities committed to lending programs to the \$64 billion of currently actively used supply yields a total current active supply of around \$80 billion, or around 13 per cent of total CGS and semi-government securities outstanding.

### Collateral re-use and effective supply in Australia

Table 2 may be used to estimate the current rate of collateral re-use. The relevant metrics are:

- *Total source collateral.* This is equivalent to the current actively used supply, calculated above as around \$64 billion.

- *Total collateral use.* This may be estimated from the sum of total source collateral (above) and total collateral received and then re-used by respondent dealers (i.e. the 'Total' in the third row of Table 2): around \$101 billion.

The rate of collateral re-use may then be estimated by dividing total collateral use by total source collateral. This returns a rate of current re-use of a little under 1.6 times.

Applying this to the estimate of active supply derived earlier, \$80 billion, yields a current effective supply of \$128 billion. This is around 20 per cent of total outstanding issuance.

### Changes in the Effective Supply of Collateral

Importantly, neither active supply nor re-use are fixed quantities. The regulatory changes identified above will have implications not only for demand, but also for the way that collateral circulates through the system and is ultimately used. Increased use of CCPs and greater segregation of derivatives-related client margin, for instance, will reduce the rate of re-use of collateral. More generally, market participants' responses to changes in relative prices, loan terms and repo rates will influence their investment and asset allocation decisions, potentially altering both active supply and the rate of re-use.

### Potential changes in active supply

Active supply could, of course, change as the total issuance of high-quality securities changes, depending on how new supply is absorbed into the market. Over time, adjustments in relative asset prices could also create an incentive for some existing holders of high-quality assets to reallocate their portfolios. However, there is traditionally 'stickiness' in many investment mandates. Even price-sensitive investors may adjust with a considerable lag. Furthermore, some investors will naturally react slowly to price changes, perhaps because their fixed income investments are hedging long-term cash flows or other liabilities. Nevertheless, if loan terms or

repo rates on high-quality assets became attractive, some of these assets could be encouraged into securities lending programs or repo markets, and thereby become 'active'.

Although it is not possible to reliably predict how active supply will change over time in response to changing relative prices or changing loan terms and repo rates, some observations may be made:

- In the case of banks and securities dealers, there may be limited scope for additional government-related asset holdings to be actively used as collateral. As noted, the increase in these institutions' holdings is largely in anticipation of the formal introduction of the LCR. Accordingly, to the extent that relative prices encouraged banks to retain these holdings in government-related securities rather than ESA balances, they would need to remain unencumbered on banks' balance sheets. APRA has estimated that the LCR could generate a total demand for LCR-eligible assets in excess of \$400 billion. If met entirely with government-related securities, this would require a substantial further increase in banks' holdings of these securities, to more than two-thirds of the total outstanding supply. Such an increase, if it was even possible, would cause significant disruption to the functioning of the market and adversely affect the liquidity of the market. Hence, it would be self-defeating. Given this, authorised deposit-taking institutions (ADIs) will be able to establish a committed liquidity facility (CLF) with the RBA to help meet these requirements (Debelle 2011). A related justification for the CLF is that, if a supply-demand imbalance left government securities too expensive, banks would meet the LCR using ESA balances with the RBA. This would have the potential to affect monetary policy implementation by making the demand for ESA balances unstable. With the CLF, the RBA commits to making available a pre-agreed amount of liquidity under repo against any securities that are eligible in the RBA's

normal operations. This extends beyond CGS and semi-government securities.<sup>9</sup>

- Given the current very low active use of CGS and semi-government securities by institutional investors/non-residents as a proportion of their holdings, the release for loan or repo of a small additional proportion of these holdings could materially increase the active supply of these securities.

### Potential changes in collateral re-use

Similarly, the rate of collateral re-use is not fixed. Faced with tightness in collateral markets, financial institutions could seek to re-use the collateral they receive more effectively. This may be supported by the emergence of centralised collateral management services and other technological or institutional advances that assist market participants in optimising their collateral use.

The scope to increase the rate of collateral re-use may at the same time, however, be limited by regulatory and behavioural developments. As noted, increased use of CCPs (and segregation of client assets at CCPs) will reduce collateral re-use since CCPs are end points in collateral chains. Restrictions on re-use in the forthcoming international standards for margining of non-centrally cleared derivatives will have a similar effect.

In addition, behavioural changes are important. With the experience of the default of Lehman Brothers there is increased awareness of the risks of rehypothecation and re-use of collateral. Some investors no longer permit the practice; others are restricting it and are requiring greater transparency of the activity. In a similar vein, investors are increasingly seeking better segregation of client assets and managing exposures to their agents more carefully.

<sup>9</sup> ADIs will be charged a fee of 15 basis points for this commitment. The fee has been set to reflect the typical liquidity premium between assets eligible for the CLF and high-quality liquid assets, thereby leaving ADIs indifferent between meeting the LCR using high-quality liquidity assets to the extent available and doing so by establishing the CLF.

The effect of these developments has been observed in other markets. Singh (2013) reports that collateral re-use in the United States has fallen sharply since the global financial crisis. This has coincided with an observed decline in repo activity.

## Discussion

At present, the current effective supply of high-quality assets would seem to be sufficient to support collateral demand. Current repo rates do not suggest that there is a shortage of securities available for repo and the utilisation rate of government-related securities committed to lending programs is relatively low. The Australian collateral market should be able to adapt to regulatory and market developments, including the incremental collateral demand arising from initial margining of non-centrally cleared derivatives, as well as both increased demand and potentially reduced re-use due to central clearing of OTC derivatives. Again, however, the distribution of eligible collateral holdings is important, and some market participants may still face liquidity constraints.

The analysis in this article supports the measured approach taken by the Australian authorities to the implementation of new regulations. The decision to permit ADIs to establish a CLF with the RBA to assist in meeting the new LCR requirement when it comes into force next year acknowledges the potential implications of these new requirements for the active supply of high-quality assets. The analysis also supports the Australian authorities' opposition to applying initial margin requirements to non-centrally cleared foreign exchange transactions, and the recommendation that mandatory central clearing requirements should not be extended to non-dealers. More generally, the RBA's collateral eligibility criteria for its market operations permit a broader range of assets to be used than the CGS and semi-government securities that are currently typically used. If market participants faced material collateral constraints, greater use could potentially be made of RBA-eligible non-government securities.

Finally, the article highlights the important role of collateral re-use in boosting effective supply, particularly in markets such as Australia with relatively low active supply. Seeking to address concerns around the financial stability risks associated with collateral rehypothecation and re-use by placing tight restrictions on such activity could therefore be counterproductive. This lends support to the findings of recent work by the Financial Stability Board, which instead focused on greater transparency of securities lending and repo activity and better disclosure to clients about the extent to which their collateral would be rehypothecated (FSB 2013). Data such as those collected by the RBA to inform this article could be a useful addition to policymakers' information set in this area. ✎

## References

- APRA (Australian Prudential Regulatory Authority), ASIC (Australian Securities and Investments Commission) and RBA (Reserve Bank of Australia) (2014)**, 'Report on the Australian OTC Derivatives Market', April.
- Australian Treasury (2014)**, 'Implementation of Australia's G20 Over-the-Counter Derivatives Commitments: AUD-IRD Central Clearing Mandate', Proposals Paper, July.
- Capel J and A Levels (2012)**, 'Is Collateral Becoming Scarce? Evidence for the Euro Area', *Journal of Financial Market Infrastructures*, 1(1), pp 29–53.
- CGFS (Committee on the Global Financial System) (2013)**, *Asset Encumbrance, Financial Reform and the Demand for Collateral Assets*, CGFS Papers No 49, Bank for International Settlements, Basel.
- CPSS-IOSCO (Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions) (2012)**, *Principles for Financial Market Infrastructure*, Bank for International Settlements, Basel.
- Debelle G (2011)**, 'The Committed Liquidity Facility', Speech to the APRA Basel III Implementation Workshop, Sydney, 23 November.
- Duffie D, M Scheicher and G Vuillemy (2014)**, 'Central Clearing and Collateral Demand', NBER Working Paper No 19890.

**Duffie D and H Zhu (2011)**, 'Does a Central Clearing Counterparty Reduce Counterparty Risk', *Review of Asset Pricing Studies*, 1(1), pp 74–95.

**FSB (Financial Stability Board) (2013)**, 'Policy Framework for Strengthening Oversight and Regulation of Shadow Banking', Final Policy Framework, 29 August.

**Heath A and M Manning (2012)**, 'Financial Regulation and Australian Dollar Liquid Assets', *RBA Bulletin*, September, pp 43–52.

**Heath A, G Kelly and M Manning (2013)**, 'OTC Derivatives Reform: Netting and Networks', in A Heath, M Lilley and M Manning (eds), *Liquidity and Funding Markets*, Proceedings of a Conference, Reserve Bank of Australia, Sydney, pp 33–73.

**Heller D and N Vause (2012)**, 'Collateral Requirements for Mandatory Central Clearing of Over-the-Counter Derivatives', BIS Working Paper No 373.

**ISDA (International Swaps and Derivatives Association) (2012)**, 'BCBS-IOSCO Proposal on Margin Requirements for Non-Centrally-Cleared Derivatives', Letter to BCBS (Basel Committee on Banking Supervision) and IOSCO, 12 December.

**ISDA (2014)**, 'Margin Survey – 2014', ISDA Market Research Report, 10 April.

**Markit (2013)**, 'Securities Finance Review – Q1 2013', Markit Research Report, 10 May.

**Sidanius C and F Zikes (2012)**, 'OTC Derivatives Reform and Collateral Demand Impact', Bank of England Financial Stability Paper No 18.

**Singh M (2013)**, 'The Changing Collateral Space', IMF Working Paper WP/13/25.

**Wakeling D and I Wilson (2010)**, 'The Repo Market in Australia', *RBA Bulletin*, December, pp 27–35.