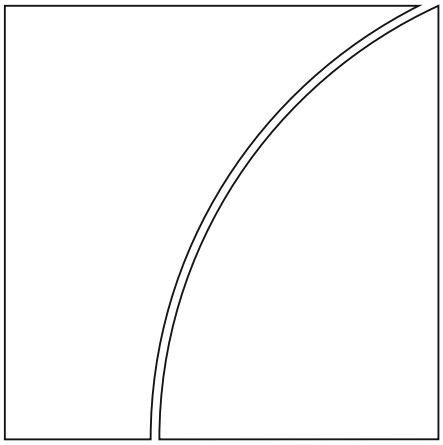
Markets Committee



Central bank collateral frameworks and practices

A report by a Study Group established by the Markets Committee

This Study Group was chaired by Guy Debelle, Assistant Governor of the Reserve Bank of Australia

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Preface

In July 2012, the Markets Committee established a Study Group to take stock of how collateral frameworks and practices compare across central banks and the key changes they have undergone since mid-2007. This initiative followed from the fact that, in the light of recent experience with market stress and other underlying changes in the financial landscape, many central banks have re-examined and adapted their collateral policies. It is also a natural extension of the Committee's previous work on central bank monetary policy and operating frameworks.

The Study Group was chaired by Guy Debelle, Assistant Governor of the Reserve Bank of Australia. The Group completed an interim report for review by the Markets Committee in November 2012. The finalised report was presented to central bank Governors of the Global Economy Meeting in early March 2013.

The subject matter of this study is of core relevance to central banking. I believe the report could become a reference piece for those who are interested in central bank liquidity operations in different jurisdictions. Moreover, given the growing attention focused on collateral-related issues in the broader financial system, this report, which covers one specific area of collateral practices, could also serve as factual input to the wider debate.

Hiroshi Nakaso
Chairman, Markets Committee
Deputy Governor, Bank of Japan

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Executive summary

The rules governing the eligibility of collateral and its terms of use are an integral part of how central banks provide liquidity to the financial system on a day-to-day basis. While it tends to attract little public attention in normal times, the role of central bank collateral policies came to the fore as the global financial crisis unfolded.

Experience gained from recent episodes of market stress, along with other ongoing changes in financial markets and the broader financial system, have prompted central banks to re-examine their collateral policies. In many cases, they have incorporated new features in the light of these developments. It is therefore timely to take stock of what central banks have done in this regard.

This report presents the findings of a stocktaking exercise conducted by a Study Group consisting of experts from 16 Markets Committee member central banks. The report has two parts. Section 1 examines how collateral frameworks compare across central banks and how they have changed since before the global financial crisis. The comparison is based on the key features of 12 collateral frameworks at two points in time: June 2007 and July 2012. The focus is more on the longer-term evolution of central bank collateral policies and less on the temporary measures adopted during the height of the crisis.

Section 2 looks at how collateral was actually used over the sample period. It presents data on the amount of collateral pledged by counterparties to each central bank at four points in time: June 2007, June 2008, March 2009 and July 2012. The data include a breakdown by issuer type (and selected security type) to shed light on the composition of collateral as well. The data were collected using a common template to enable comparability across central banks.

The key findings are summarised as follows:

- The information gathered illustrates different styles of collateral frameworks – in terms not only of eligible asset types, but also of other dimensions such as eligibility across lending facilities, haircut policies, collateral management (earmarked or in a pool), etc. The observed diversity reflects differences in local factors such as central bank legislation, financial market structure and state of development, and whether there is a structural liquidity surplus or deficit in the relevant financial system. That said, there are clearly some common principles underpinning these frameworks (eg transparency of eligibility criteria, centrality of risk management measures).
- Central banks in the sample have modified their collateral frameworks over the past five years to varying degrees. These modifications reflect changes in the operating environment and the lessons learned during the global financial crisis – though not all modifications are direct consequences of the crisis. Overall, central bank collateral frameworks today tend to be somewhat broader than in mid-2007, accepting more asset types, including in some cases cross-border collateral. The haircut/initial margin schedules today tend to be more granular, reflecting the information gained about the performance of different asset classes over time, and particularly in stressed conditions during the crisis.
- Notwithstanding a few exceptions, the amount of collateral pledged to central banks typically increased during 2008–09 and declined afterwards. In some cases, this pattern reflects a stabilisation of market conditions since 2009, but in

some others it reflects the adoption of non-conventional policies such as large-scale outright asset purchases, reducing the need for central banks to lend against collateral.

- There is considerable diversity in the composition of collateral across central banks and across time. Notably, the data suggest that central banks with wide frameworks do not always receive the full range of eligible collateral, nor do they always attract the least liquid assets, though the tendency for the latter is greater in stressed times than in less volatile times. Central banks can and do influence the relative cost of pledging different types of eligible collateral by adjusting haircuts/initial margins and/or the pricing of lending operations and facilities (if collateral eligibility differs across operations and facilities).

This study group report is deliberately narrow in scope to allow it to go deeper into the technical details of central bank liquidity operations and collateral practices. The aim of this report is to provide an organising framework for characterising different central banks' collateral policies. By instilling some structure, one can more easily identify the common elements that underpin central bank collateral policies, as well as the jurisdiction-specific features that result in the observed differences. This can facilitate a more coherent and meaningful discussion of collateral policy considerations and their impact on market functioning.

List of abbreviations

Central bank	**Central bank abbreviation**	**Jurisdiction abbreviation**
Reserve Bank of Australia	RBA	AU
Bank of Canada	BoC	CA
European Central Bank	ECB	Eurosystem
Bank of France		FR
Deutsche Bundesbank		DE
Reserve Bank of India	RBI	IN
Bank of Italy		IT
Bank of Japan	BoJ	JP
Bank of Korea	BoK	KR
Bank of Mexico		MX
Monetary Authority of Singapore	MAS	SG
Bank of Spain		ES
Sveriges Riksbank		SE
Swiss National Bank	SNB	CH
Bank of England	BoE	UK
Federal Reserve System		US

Introduction

Central banks' day-to-day liquidity operations attracted greater public attention with the onset of money market turmoil in August 2007. Besides adjusting the frequency, size, maturity and pricing of liquidity provision, central banks also altered to varying degrees their counterparty and collateral eligibility as the global financial crisis unfolded. In particular, as a temporary crisis management measure, many accepted a broader set of collateral (in terms of asset type, credit quality, issuer nationality or country of domicile, currency denomination, etc). After the most acute phase of the global crisis in 2008–09, central banks removed some of these measures while making others permanent.

These events, along with other changes in financial markets and the broader financial system, have prompted central banks to re-examine their collateral policies and, in many cases, incorporate new features to adapt to the new operating environment. It is therefore timely to take stock of how central banks have updated their collateral practices.

Against this background, in July 2012 the Markets Committee established a study group to examine how central bank collateral policies had evolved since mid-2007. This stocktake provides a factual basis for broader discussions of the implications of central bank lending operations/facilities (including for the availability of collateral). To compare the current state of play with that before the crisis, the study group, comprising experts from 16 central banks, collected information on the key features of 12 collateral frameworks at two points in time: June 2007 and July 2012. To document how the use of collateral evolved over this five-year period, the group also gathered data on the amount and type of collateral pledged to central banks at four points in time: June 2007, June 2008, March 2009 and July 2012. A common template was used to enable comparability across central banks.

This report presents the study group's findings. Section 1 looks at the various collateral *framework* styles represented in the group and the changes over the past five years. Although framework styles vary across central banks, there are some common principles underpinning these frameworks. One of them dates back to at least as far as Bagehot: namely, that a central bank should lend against good collateral at an appropriate price, while managing the risk associated with such activity. The risk management aspect is reflected in the haircut schedules adopted, the rate charged for the provision of liquidity, and access criteria to liquidity. That said, how these principles are applied in practice can differ across central banks. The observed diversity in collateral framework styles reflects differences in local factors such as central bank legislation, financial market structure and state of development, and whether there is a structural liquidity surplus or deficit in the relevant financial system. Central banks in the sample have modified their collateral frameworks over the past five years to varying degrees. These modifications reflect changes in the operating environment and the lessons learned during the global financial crisis – though not all modifications are direct consequences of the crisis. Overall, central bank collateral frameworks today tend to be somewhat broader than in mid-2007, accepting more asset types, including in some cases foreign-

issued and/or foreign-currency assets (cross-border collateral).[1] The haircut/initial margin schedules today tend to be more granular, reflecting the information gained about the performance of different asset classes over time, and particularly in stressed conditions observed during the crisis.

Section 2 discusses the evolution in the actual *amount and composition* of collateral pledged to central banks during this period. The amount of collateral pledged typically increased during 2008–09 and declined afterwards. This reflects in some cases a stabilisation of market conditions since 2009, but in others the adoption of non-conventional easing through outright asset purchases. There is considerable diversity in the composition of collateral across central banks and across time. Notably, the data suggest that central banks with wide collateral frameworks do not always receive the full range of eligible collateral, nor do they necessarily always attract the least liquid assets, though the tendency for the latter is greater in stressed times than in less volatile times. Central banks can and do influence the relative cost of different types of eligible collateral by adjusting haircuts/initial margins and/or the pricing of lending operations and facilities (if collateral eligibility differs across operations and facilities). Financial sector regulations may also affect counterparties' choice over collateral use, though an investigation of the impact of regulatory factors and of the interaction with market conditions and central banks' collateral rules is beyond the scope of this report.

1. Collateral frameworks

This section looks at how collateral frameworks vary across central banks both in terms of basic styles (Section 1.1) and disclosure and credit assessment practices (Section 1.4). In doing so, it provides an organising taxonomy that can be used to compare and contrast the various frameworks. It notes that while common principles underpin central banks' approaches to collateral, how these principles are applied can differ considerably across jurisdictions because of local factors (Section 1.2). It also documents how collateral frameworks have changed since mid-2007 (Section 1.3).

The discussion refers mostly to the collateral rules and practices applying to *standard* market operations (OMOs)[2] and standing liquidity facilities (SFs)[3] of each central bank. Lender of last resort type emergency liquidity assistance (ELA) is specifically identified where necessary. Outright transactions are mentioned where relevant but not discussed specifically. The collateral, if any, provided by central

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[1] Following the January 2006 report *Cross-border collateral arrangements* of the Committee on Payment and Settlement Systems, collateral is defined as foreign, or used *cross-border*, if, from the perspective of the jurisdiction in which the assets are accepted, at least one of the following is foreign: the currency of denomination, the jurisdiction in which the assets are located or the jurisdiction in which the issuer is established.

[2] Include repos and collateralised loans, typically conducted at the initiative of the central bank in the form of auctions or bilateral transactions.

[3] Include intraday, overnight and longer-term lending facilities that are accessed at the initiative of the counterparties.

banks to facilitate liquidity absorption is not discussed here, as this is typically governed by a different set of rules.

1.1 Basic styles: diversity across central banks

Among the 12 frameworks represented in the group, it is possible to identify three main points of differentiation.

Uniform vs differentiated. As of July 2012, five of the 12 frameworks apply *uniform* collateral eligibility to all lending operations and facilities (Table 1, column 1). The other seven frameworks have different sets of eligible collateral for different operations/facilities. In these *differentiated* frameworks, it is typical to see marginal lending or liquidity insurance facilities allow the use of less liquid collateral, while routine refinancing market operations allow only liquid collateral. This suggests that acceptance of less liquid collateral tends to be associated with lending with more penal pricing, in keeping with the principles of Bagehot, and to provide protection to the central bank's balance sheet.

Narrow vs wide. As to the range of asset classes that are accepted, both *narrow* and *wide* frameworks are represented (Table 1, column 2). For instance, in terms of eligible issuer types, the Reserve Bank of India (RBI) and the Monetary Authority of Singapore (MAS) have relatively narrow frameworks, accepting primarily (domestic) public sector securities (Table 1a). By contrast, the Eurosystem is an example of a uniformly wide framework, accepting also the obligations of financial and non-financial private sector entities. Some frameworks have narrow eligibility for some facilities and wider eligibility for others (eg CA, KR, MX, UK, US). This characterisation of narrow or wide is more nuanced when other eligibility requirements are taken into account. For example, the Swiss National Bank (SNB) is wide in terms of eligible issuer types and currencies, but is rather narrow with respect to ratings requirements (only very highly rated securities are eligible).

Some frameworks also have built-in **discretion** to allow the acceptance of additional types of collateral in some situations. For example, the Reserve Bank of Australia (RBA) framework permits the acceptance of related-party asset-backed securities (ABS), including self-securitisations, in "extraordinary circumstances" as determined by the central bank. The Bank of England (BoE) Extended Collateral Term Repo (ECTR) facility, which accepts a much wider range of collateral than do its other repo facilities, is part of the permanent operating framework but is activated only when the central bank sees "actual or prospective market-wide stress of an exceptional nature".[4]

Earmarked vs pooled. Currently, about half of the frameworks in the sample manage collateral in *earmarked* systems where the collateral delivered is earmarked for specific loans or repos (Table 1, column 3). A few others use *pooled* systems whereby collateral is pledged into a pool, with lending backed by the value of the whole pool and not linked to individual assets therein. The rest adopt *mixed* systems, with both earmarked and pooled collateral. Although whether collateral is

[4] In the BoE's Indexed Long-Term Repo (ILTR), by contrast, the amounts lent against "narrow" and "wider" collateral are determined by an auction mechanism (ie the level of stress is deduced from the bids), without any exercise of – or reliance on – central bank discretion.

Selected aspects of collateral framework styles

As of end-July 2012 Table 1

	Uniform or differentiated[1]	Narrow or wide[2] (in terms of issuer type)	Earmarked or pooled[3]	Counterparty eligibility for lending operations/facilities[4]
Australia	Uniform	Wide	Earmarked	Wide
Canada	Differentiated	Narrow for OMOs Wider for SF	Earmarked for OMOs Pooled for SF	OMOs are for Primary Dealers SF is for payment system (LVTS) participants
Eurosystem	Uniform	Wide	Mostly pooled[5]	Wide (in terms of both type and number)
India	Differentiated	Narrow (but in different ways across facilities)	Earmarked	LAF (OMO) and MSF (SF) are for banks and Primary Dealers SLF (SF) consists of (i) export credit refinance to banks, (ii) liquidity support to Primary Dealers, (iii) special refinance to financial institutions[6]
Japan	Uniform	Wide	Pooled	Wide but varies with facility
Korea	Differentiated	Narrow for OMOs Wider for SF	Earmarked for OMOs Pooled for SF	Narrow for OMOs Wider for SF
Mexico	Differentiated[7]	Narrow for OMOs Wider for SF	Earmarked	OMOs are for all local banks SF for private sector banks only
Singapore	Differentiated[7]	Narrow (narrower for OMOs than for SF)	Earmarked	Primary Dealers only for OMOs All RTGS participants for SF
Sweden	Uniform	Wide	Mostly pooled	Wide
Switzerland	Uniform	Wide	Earmarked for OMOs Pooled for SF	Wide (both in terms of type and country of domicile)
United Kingdom	Differentiated[7]	Varies with facility: "narrow" for RTGS, ST, OSF; "narrow"+"wider" for ILTR; include also "extended" for DWF, ECTR, FLS[8]	Earmarked	Varies with facility: banks only for liquidity insurance; some non-bank financial institutions can participate in short-term OMOs[9]
United States	Differentiated	Narrow for OMOs Wide for SF	Earmarked for OMOs Pooled for SF	Primary Dealers only for OMOs Wide for SF

[1] Uniform = same collateral eligibility for all lending (OMO and SF) in the normal monetary operating framework; differentiated = different collateral eligibility for different types of lending.

[2] Narrow = essentially only one type of eligible issuers (typically sovereigns/public sector); wide(r) = more than one type of issuers.

[3] Earmarked = collateral delivered is earmarked for specific loans or repos; Pooled = collateral is pledged into a pool, with lending backed by the value of the whole pool and not linked to individual assets therein.

[4] Narrow = restricted to a selected few institutions (eg a primary dealer only type system).

[5] Bank of Spain is currently the only Eurosystem national central bank with both earmarked and pooled collateral, which give counterparties more flexibility.

[6] LAF = Liquidity Adjustment Facility; MSF = Marginal Standing Facility; SLF = Standing Liquidity Facility.

[7] Became differentiated only within the previous five years (ie after June 2007).

[8] RTGS = Real time gross settlement (payment system); ST = short-term OMOs; OSF = Operational Standing Facility; ILTR = Indexed Long-Term Repo; DWF = Discount Window Facility; ECTR = Extended Collateral Term Repo; FLS = Funding for Lending Scheme.

[9] Regular short-term (one-week) OMOs are currently suspended.

pooled or earmarked does not affect eligibility, it has implications for how counterparties choose to use collateral (see Section 2).

1.2 Factors affecting the choice of collateral framework

The principles underpinning collateral frameworks across central banks tend to be similar. In general, there is a preference for assets that have low credit risk and price risk, assets that are liquid, as, in extremis, a central bank may need to sell the assets, and assets where risk can be equalised (mainly through the use of haircuts). In practice, however, the principles are applied in quite different ways to achieve policy goals. This reflects a number of factors:

1.2.1 Structural and institutional features

Key aspects of the **framework for monetary policy implementation**, such as the operating target (eg overnight rate, other rates, or quantities), reserve arrangements (eg over what period a bank has to meet a reserve requirement) and interest rate corridors influence how frequently a central bank needs to inject (or withdraw) liquidity. For example, central banks with exchange rate operating targets may need to design frameworks around the need to both inject and withdraw system liquidity, potentially for prolonged periods of time.

Particular institutional arrangements involving the central bank also play a role. For instance, if the government banks with the central bank (rather than with a commercial bank), government flows such as spending and tax receipts will affect system liquidity. The central bank needs to be able to manage the liquidity impact of such flows, factoring this into its market operations and collateral framework.

The same argument holds for other autonomous factors, ie flows that add to or subtract from system liquidity. These include foreign exchange flows, as mentioned earlier, and the system's demand for banknotes.

Some systems have **structural liquidity positions** – the typical state of system liquidity each day before the central bank conducts any liquidity management operations – that are persistently in surplus or deficit. Central banks in systems with structural surpluses typically absorb (rather than provide) liquidity. Accordingly, they tend to have less need for a broad range of eligible collateral than do central banks that face structural liquidity deficits.

Differences in **institutional profiles** can also lead to variances in approaches to collateral eligibility. In some jurisdictions (eg US), liquidity-providing OMOs are accessible only by a select group of securities firms (Primary Dealers), while SFs are open to a larger and more diverse group of deposit-taking institutions (Table 1, column 4). Reflecting this difference across facilities, OMOs accept only government securities, agency securities and agency mortgage-backed securities (MBS) as collateral, while SFs accept a much wider range of assets. By contrast, in jurisdictions that adopt a uniformly wide counterparty eligibility (eg Eurosystem, SNB), collateral eligibility must also be broad enough to accommodate both big and small counterparties with different business models and countries of domicile.

1.2.2 Market size and state of development

Central banks' choice of collateral framework can be influenced by the **availability of high-quality liquid assets**. For instance, in jurisdictions with sufficiently large supplies of actively traded domestic government bonds, such bonds could well be

the predominant type of eligible collateral for central bank operations. By contrast, in jurisdictions where government bonds are relatively scarce (due to a lack of bond issuance given a history of fiscal surpluses or small deficits) or are not sufficiently actively traded, central banks may accept a broader range of collateral, including private sector securities and foreign currency-denominated assets, to ensure that counterparties have sufficient eligible assets to access central bank liquidity.

Some collateral frameworks may also reflect a secondary aim of **promoting the development of certain financial markets**, such as the market for certain asset-backed securities. Central bank eligibility tends to improve the liquidity of these securities.

1.2.3 Legal and governance characteristics

Legal characteristics can influence collateral frameworks because they speak to the ease – and the degree of certainty – with which security interests can be effected. For example, central banks might take residential mortgage-backed securities (RMBS) as collateral but not individual mortgage loans from banks, even though the underlying asset is the same.

Some **central bank laws** have clear provisions on what asset types can or cannot be accepted as collateral or in outright purchases. Central banks that operate under a relatively restrictive legal framework would normally have less scope to expand collateral eligibility than do those that face fewer legal restrictions in this area.

The **availability of credit assessment expertise** within central banks also can influence the choice of collateral framework. To reduce mechanistic reliance on external credit ratings agencies, some central banks have developed internal credit assessment teams that can undertake sophisticated risk assessments and calculate relevant haircuts so that risk can be equalised. The build-up of such in-house expertise has in some cases meant an increased preparedness to accept collateral that might not otherwise have been part of standard collateral frameworks (see below).

1.2.4 History

History also plays a part in the development of collateral frameworks. For example, the Eurosystem's uniformly wide framework, which accepts obligations of both financial and non-financial private sector entities, reflects the wide range of collateral frameworks across the member national central banks prior to the creation of the euro.

The path of financial development, including the order in which various asset classes have developed depth and liquidity, has often varied across countries and resulted in differences in collateral frameworks. Likewise, past experiences with market turmoil, which again vary across jurisdictions, can inform current and future choices of collateral frameworks.

1.3 Changes over the past five years

During the height of the financial crisis in 2008–09, a number of central banks introduced, to varying degrees, crisis management measures such as a *temporary* acceptance of additional types of collateral, a *temporary* lowering of the minimum rating requirements of existing eligible collateral or a *temporary* relaxation of haircut

standards. Many of these temporary changes have expired. One notable exception is the Eurosystem, which currently still has a number of temporary measures (eg acceptance of some ABS with lower initial ratings, additional credit claims that satisfy national central bank-specific eligibility criteria and some foreign currency-denominated securities issued and held in the euro area;[5] the introduction of temporary measures to broaden collateral availability was also accompanied by some adjustments to risk control).

Central banks have by and large moved back to more normal collateral frameworks, but with changes which often reflect, among other things, the lessons learned about the performance of various asset classes though the crisis.

Some observations on how the current frameworks compare with the pre-crisis versions are outlined below. While some central banks have explicitly incorporated selected elements of their crisis measures into their revised frameworks, **not all of the observable changes are related to crisis management**. Some new features are simply the result of normal periodic reviews and updating to make the collateral framework consistent with developments in the broader financial system (including regulatory changes) and the market environment.

1.3.1 Mid-2007 versus now: key themes

Collateral type. Many collateral frameworks represented in the group are now broader than they were in mid-2007 (Table 1a). Some central banks now include *foreign currency* assets in their normal framework (eg CA, JP, MX, SG)[6] or *foreign-issued* domestic currency assets (eg AU, SG) in at least some lending facilities, if not all. In addition to foreign assets, new types of domestic assets have also become eligible at a number of central banks, eg AU (covered bonds),[7] CA (bank-sponsored ABCP, non-mortgage loan portfolio), Eurosystem (fixed-term deposits, additional types of credit claims), JP (obligations of real estate investment corporations, loans on deeds to municipal governments), KR (credit securities),[8] MX (MBS), SE (own covered bonds, some types of debt instruments issued by banks), US (covered bonds, term deposit facility),[9] and UK (addition of the "extended" collateral set, also reclassification of assets in the "narrow" and "wider" sets).[10]

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5 Easier implementation is the main reason for adding foreign-currency securities issued and held in euro area, but not those from outside the euro area (the latter may entail more legal hurdles).

6 See Section 1.3.3 for a further discussion of the acceptance of foreign currency collateral.

7 Bank debt issued under the temporary government guarantee programme established at the height of the crisis in 2008 have also been included as eligible collateral, though at the time of writing these instruments have nearly all matured and will soon no longer be relevant.

8 Credit securities refer to credit claims such as commercial bills acquired by financial institutions through loans. Bank debentures and special law bonds (similar to agency securities) were temporarily included as eligible collateral from November 2008 to November 2009.

9 See footnote 7.

10 See www.bankofengland.co.uk/markets/Documents/marketnotice110211.pdf for details of the asset reclassification.

Eligibility of key asset types

As of end-July 2012 Table 1a

	Public sector securities	Financial entity debt	Covered bonds	Other asset-backed[1]	Corporate debt	Non-securities[2]	Cross-border[3]	
							Issuer	Currency
Australia	✓	✓+	☑	☑	☑		☑	
Canada	✓	✓		☑	✓	☑	✓+	☑
Eurosystem	✓	✓	✓	✓	✓	✓+	✓[4]	(☑)[5]
India	✓					✓		
Japan	✓+	☑		✓	✓+	✓+	✓	☑
Korea	✓					✓		
Mexico	✓	☑		☑	☑	✓	☑	☑
Singapore	✓+						☑	☑
Sweden	✓	☑	✓+	✓	✓		✓	✓
Switzerland	✓	✓	✓		✓		✓+	✓+
United Kingdom	✓	☑	☑	☑	☑	☑	✓+	✓+
United States	✓	✓	✓+	✓	✓	✓+[6]	✓	✓

Excludes assets that were temporarily eligible during the global financial crisis but are no longer eligible as of July 2012.

✓ = this asset type is eligible as collateral

✓+ = there are more eligible sub-types of this asset now compared with mid-2007

☑ = this asset type is newly eligible (eligibility began sometime after mid-2007)

[1] Other asset-backed = securities such as ABS, MBS, RMBS, CMBS, ABCP.

[2] Non-securities = assets such as loans or other credit claims that are not securitised, deposits at central banks, etc.

[3] Cross-border/Issuer = obligations issued by foreign entities, can be denominated in any currency; Cross-border/Currency = assets denominated in foreign currencies.

[4] For marketable securities only; but must be issued in the euro area.

[5] There were two periods of this extension: 13 November 2008–31 December 2009 and again from 9 November 2012 (still in place at the time the report was finalised).

[6] Denotes mainly the addition of Term Deposit Facility deposits (a new central bank facility) as eligible collateral for the Discount Window, not expansion of eligibility in the more traditional sense.

Minimum rating requirements. Some central banks have adjusted their credit rating thresholds. A few have lowered the minimum rating requirements for at least some assets, eg AU (securities of deposit-taking intermediaries), Eurosystem (marketable securities and credit claims), SE (all assets, which are also all marketable). To diversify the credit assessment methodologies used, the Bank of Canada (BoC) now requires at least two ratings for assets to be pledged to the Standing Liquidity Facility. More generally, many central banks have endeavoured to reduce the role that credit ratings play in their collateral frameworks, with ratings being a guide and trigger for a review of collateral eligibility rather than a hard-edged criterion.[11] For example, after publicly affirming in 2010 that it always forms

[11] This trend is in line with the October 2010 FSB principles for reducing mechanistic reliance on credit ratings (*Principles for reducing reliance on CRA ratings*). In particular, Principle III.1 says, "Central banks should reach their own credit judgements on the financial instruments that they will accept in

its own independent view about collateral, the BoE removed in 2011 most references to credit ratings in its published framework. In particular, the "narrow" collateral set is now a defined list of sovereign securities that are judged by the central bank to be *robustly liquid* in almost all conditions, obviating the need for any external rating requirements. The "wider" collateral set still refers to credit ratings but only as one of several indicators of likely eligibility of ABS – actual eligibility is determined by the BoE's own analysis of the underlying collateral.

Valuation haircuts (or initial margins). Some central banks have adjusted, as part of their periodic reviews, the *size* of haircuts applied to collateral, eg JP (lower across the board), US (lower for some collateral, especially in longer-duration buckets, for the Discount Window), and SE (higher add-on haircuts for foreign exchange risk for USD- and JPY-denominated collateral to reflect higher FX volatility).[12] Some others have even revised the *structure* of their haircut schedules, in some cases adopting a more granular approach that shows more sensitivity to the various characteristics (type, maturity, credit, liquidity) of assets and their performance through the cycle and particularly in stressed market conditions, eg AU (new schedule in 2012), CA (review in 2010), Eurosystem (added a fifth liquidity category for marketable assets, made haircuts vary also with credit quality steps). In 2009 Korea shifted from using initial margins to using haircuts for its standing facilities.[13]

Other risk control measures. In addition to adjusting haircuts, there are examples of other risk controls being adjusted. The BoC recently introduced a more formalised margin call policy to all its term repo operations.[14] In addition, for non-mortgage loan portfolios (made eligible during the crisis, but now retained as part of the normal framework), it has lowered the concentration limit to 20% of total collateral pledged (down from 100% during the crisis). This also means that the concentration limit can now be used as an additional lever for scaling the eligible set of collateral up or down if needed. Sveriges Riksbank has removed the concentration limit on self-issued covered bonds (when these bonds were first accepted during the crisis, there was a limit of 25% of a borrower's total collateral value). From 2014, however, it will apply concentration limits on lower-rated securities and "close link" securities to discourage banks from pledging too much less liquid collateral to the central bank.[15] When the BoE reclassified the eligible assets in its "narrow" and "wider" sets in 2011, the concentration limit on "narrow" (ie most robustly liquid) collateral was dropped, but other collateral pledged to

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market operations, both as collateral and as outright purchases. Central bank policies should avoid mechanistic approaches that could lead to unnecessarily abrupt and large changes in the eligibility of financial instruments and the level of haircuts that may exacerbate cliff effects."

12 This change in turn has implications for the add-on margins for foreign currency-denominated lending (see Section 1.3.3).

13 This shift has to do with the fact that SF lending is in the form of loans, not repos. Prior to the change, there were initial margins but no built-in procedures for variation margins (mark to market). Switching to valuation haircuts helps to take into account better changes in market risk over the life of the loan.

14 For more details on this policy, see www.bankofcanada.ca/wp-content/uploads/2012/12/margin_call_practice_domestic_operations.pdf.

15 One of the changes resulting from a post-crisis review of collateral policy, announced on 5 October 2012. See www.riksbank.se/en/Press-and-published/Press/Notices/2012/Changed-regulations-for-collateral/.

OMOs continues to be subject to a per issuer concentration limit equal to the greater of GBP 250 million or 25% of the total market value of securities delivered for OMOs.[16] The Eurosystem also introduced a concentration limit for the use of unsecured bank bonds.

Collateral management. Two Eurosystem central banks migrated from an earmarked system to a pooled system (FR in February 2008 and IT in June 2010). The BoE is currently preparing to implement a Single Collateral Pool model.

1.3.2 Changes due to introduction of new operations or facilities

Some of the changes in collateral policies are linked to the adoption of new operations/facilities in central banks' permanent operating frameworks. A number of central banks have introduced **new standing liquidity facilities**, eg CA (Overnight Standing Purchase and Resale Agreement Facility for Primary Dealers),[17] IN (marginal standing facility in 2011, but takes same narrow collateral at OMOs), MX (liquidity lending facility in 2008, which takes a broader set of collateral than do OMOs).

Two central banks have introduced **securities lending/borrowing facilities** for liquidity insurance or management purposes, eg KR (December 2011, for the central bank to borrow securities to do reverse repos in normal times, and to lend high-quality securities to counterparties in stressed times) and UK (Discount Window Facility (DWF) in October 2008, which lends gilts against the "extended" eligible collateral set).

The BoE's Extended Collateral **Term Repo** (ECTR) facility (a contingent liquidity insurance facility introduced in 2011, first activated in June 2012) also accepts this "extended" set of DWF-eligible collateral.[18] The Indexed Long-Term Repo (ILTR) OMO, introduced in 2010 to permanently replace the extended long-term repos introduced in late 2007 as a temporary measure, only accepts "narrow" and "wider" but not "extended" collateral.

Two central banks have started issuing **central bank bills** (SNB in 2008, MAS in 2011), which in turn have become eligible collateral for these central banks.

1.3.3 Cross-border aspects

Over the past five years, a few central banks have joined the Riksbank, SNB, BoE and Federal Reserve in including some *foreign currency assets* as eligible collateral.

The BoC has included US Treasuries as eligible collateral for its Standing Liquidity Facility since 2008. The Bank of Japan (BoJ) began to accept in 2009 US, UK, German and French government securities denominated in their respective national currencies. The MAS also established cross-border collateral arrangements

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[16] This concentration limit applies to the Indexed Long-Term Repo (ILTR) but not to the Extended Collateral Term Repo (ECTR) facility. The BoE has discretion to vary haircuts on highly concentrated positions.

[17] This facility is available to Primary Dealers even if they are not LVTS (Large Value Transfer System) participants. LVTS participants already had access to the BoC's standing liquidity facility.

[18] DWF collateral is also used in the special Funding for Lending Scheme launched in July 2012, which lends UK Treasury bills to banks and building societies to incentivise them to lend to the real economy.

with seven central banks, thereby allowing USD, EUR, GBP, THB and MYR assets (cash, government securities and/or central bank securities, depending on the central bank) to be used at its standing facility. The Bank of Mexico has added US dollar deposits at the central bank as eligible collateral for OMOs (retaining a measure introduced during the crisis) and also made US dollar deposits and US dollar-denominated Mexican federal government securities eligible for its liquidity lending facility (part of the strategy to widen the eligible collateral for this facility).

Two central banks that have long accepted foreign assets have also broadened the range of eligible currencies and issuer nationalities (CH,[19] UK).

To compensate for FX risk, some central banks charge an add-on haircut (or simply a larger than otherwise valuation markdown or initial margin) when foreign currency-denominated collateral is used to secure domestic currency lending, eg CA (additional 4 percentage point haircut for US Treasuries), Eurosystem (16% or 26%, depending on the currency denomination of the temporarily accepted securities),[20] SE (additional 3, 4 or 5 percentage point haircut depending on the foreign currency),[21] UK (additional 6 or 8 percentage point haircut depending on the foreign currency), and US (in most cases, a 6 percentage point higher margin compared with similar but USD-denominated instruments).

Similarly, special collateral rules may apply in foreign currency lending operations to account for FX risk, eg Eurosystem (on top of usual haircuts, an additional margin of 12% for USD repos),[22] SE (on top of usual haircuts, an additional margin equal to the add-on haircut for foreign currency-denominated collateral), UK (additional haircuts of 6 or 8 percentage points, depending on the currency denomination of the non-USD securities, for USD repos).

One notable exception is the SNB, which applies no valuation haircut to collateral used in open market operations, regardless of the asset type and currency denomination of the collateral. The earmarked collateral in these operations is revalued twice daily to ensure sufficient coverage. The collateral rules for US dollar repos are the same as those for Swiss franc repos.

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[19] The SNB broadened the list of eligible collateral with effect from October 2007, but plans for this change predate the onset of financial market turmoil.

[20] On 6 September 2012, the ECB Governing Council announced, among other additional measures to preserve collateral, the acceptance of marketable debt instruments denominated in USD, GBP and JPY (but issued and held in the euro area, by issuers established in the European Economic Area) as eligible collateral in Eurosystem credit operations until further notice. On 10 October 2012, guidelines related to this temporary measure were adopted. See www.ecb.europa.eu/ecb/legal/pdf/l_28420121017en00140015a.pdf.

[21] Currently, the four eligible European currencies are assigned the same additional haircuts (3 percentage points). Starting from mid-April 2013, there will be slightly more differentiation across these currencies (GBP versus EUR, DKK, NOK) and the size of additional haircuts will be increased for all seven eligible currencies.

[22] USD operations are governed by a different legal framework from that for EUR operations.

Disclosure practices and credit assessment approaches

As October 2012 Table 2

	General criteria for eligibility[1]	Haircuts / initial margins (baseline) [1]	Individual securities' actual eligibility and effective haircuts / initial margins[2]	Credit assessment[3]
Australia	Published	Published	Securities/issuers, margins published	External
Canada	Published	Published	Not published	External
Eurosystem	Published	Published	Individual eligible securities are published Discretionary variations to haircuts are not published	Both internal and external accepted, subject to common framework (ECAF)
India	Published	Published	Not applicable since mostly domestic sovereigns	Not applicable since mostly domestic sovereigns
Japan	Published	Published	Not published	Internal
Korea	Published	Published	na (no discretionary selection of securities)	Internal
Mexico	Published	Not published	na; but amount of each government bond held as collateral for OMOs and SF is published daily	Internal
Singapore	Published for SGD assets; not for foreign currency assets under cross-border collateral arrangements (but available to counterparties upon request)		Details on individual securities are not published, but are available to counterparties upon request	Internal
Sweden	Published	Published	Published, including any discretionary variation to haircuts	External
Switzerland	Published	Published	Published (haircuts depend on facility, not security)	External
United Kingdom	Published	Published	Published list only for sovereigns and supranational bonds eligible as "narrow" or "wider" collateral Discretionary variations to haircuts are not published	Internal
United States	Published	Published for SF, not for OMOs	Not published	External

[1] Refers to disclosure of the general eligibility criteria and the basic scheme for valuation haircuts or initial margins.

[2] Refers to whether individual securities' actual eligibility and the effective haircuts/initial margin applied are published, ie including any discretion that the central bank may have exercised.

[3] External = external assessment (eg from credit rating agencies) plays a relatively big role; internal = in-house assessment by the central bank (may include external ratings, but only as one of many inputs).

1.4 Disclosure and risk assessment

The collateral frameworks are quite transparent. In particular, the eligibility *criteria* regarding security type, issuer type and currency denomination are usually publicly available on the central bank's website (Table 2, columns 1 and 2). Risk control features, such as the haircut (or initial margin) schedule, are typically also public. However, there is more variation in practice with respect to the disclosure of the

actual eligibility of *individual* securities and the effective haircuts (including any discretionary variations) applied to them (column 3). For example, those frameworks that admit only a narrow set of (mostly domestic sovereign) securities have less need to publish these details for individual securities.

The practice in disclosure is in part related to the credit assessment approach (column 4). Central banks that use internal assessments may be less inclined to publicise, in real time, any changes in the eligibility of individual securities and/or any discretionary variations to the haircuts applied, in case the decision triggers speculation over the credit quality of the issuers in question. But this is not an issue linked exclusively to internal assessment. As noted above, central banks that use external assessments usually also reserve the right to exercise some discretion over the treatment of particular assets as and when deemed appropriate. For instance, the RBA uses credit ratings primarily as a guide for haircuts, not a hard and fast criterion for eligibility. Another example is the BoE, which uses references to ratings only as a guide to the credit quality expected of collateral, not an absolute requirement. The Eurosystem also explicitly reserves the right to assess the credit standards of assets, issuers, debtors or guarantors on the basis of any information it may consider relevant. A number of other central banks reserve at least the right to refuse to accept particular assets under special circumstances, if it is judged appropriate from a risk management perspective.

2. Usage of collateral

This section documents how the amount (Section 2.1) and composition (Section 2.2) of collateral pledged to central banks have changed over the past five years. The primary focus is on collateral against central bank lending (ie repos, collateralised loans) through OMOs or SFs. Outright purchases are not discussed specifically, although they are referred to in connection with lending and collateral. The section concludes with a brief discussion of the implications of collateral use at central banks for collateral use in the market (Section 2.3).

Using a common template, each central bank in the group provided data on the amounts (value of collateral assets before haircuts, unless otherwise indicated) and types of collateral pledged by counterparties at four points in time: end-June 2007 (pre-crisis), end-June 2008 (after the onset of money market tensions but pre-Lehman), end-March 2009 (post-Lehman, onset of further non-conventional measures) and end-July 2012 (latest data available at the time when the group started work).

The template classifies collateral assets into four broad categories based on issuer type:

A. Securities issued by public sector entities (eg government of all levels, central bank, public agencies, supranationals)

B. Securities issued by private sector financial entities

C. Securities issued by private sector non-financial corporates

D. Other issuer types that cannot fit in the above, or assets that are not securities (eg non-marketable credit claims, deposits)

Private sector-issued securities (categories B and C) are further broken down into four sub-categories: unsecured debt securities, covered bonds, other asset-

backed instruments (eg ABS, MBS, RMBS, ABCP), and public sector-guaranteed securities. The template also allows central banks with earmarked collateral to break down collateral use by lending facility type (OMO and SF). Central banks with pooled collateral systems can report the total amount and types of collateral in the pool and the amount of lending outstanding backed by the pool, but cannot link types of collateral to types of lending.

Owing to the presence of both earmarked and pooled collateral systems in the sample and the wide variety of assets covered, there are limits to how far these data can lend themselves to detailed cross-country comparisons. Nonetheless, the data are sufficiently rich for conducting a preliminary investigation of how collateral use at each central bank has evolved across time.

2.1 Amount

Graph 1 shows the amount of collateral pledged to each of the central banks in the group at the four observation dates. The typical pattern over the past five years is that collateral amounts increased significantly during 2008–09 and then declined afterwards. Although collateral in pooled systems does not always vary with actual lending as closely as in earmarked systems over short time horizons, the variation in collateral amounts over a longer horizon does in most cases tend to point in the same direction as the variation in actual lending. Notably, a few central banks reported no *OMO* lending outstanding at end-July 2012 (CA, KR, SG, SE, CH, US) or a much lower amount than in June 2007 (MX,[23] UK).

In three cases (CA, SG and KR), the absence of OMO lending is normal from a historical perspective. In two of these cases (SG and KR), their systems have long tended to be in liquidity surplus, making liquidity absorption rather than provision the typical operation on a day-to-day basis.[24] By contrast, the waning need for OMO lending due to structural liquidity surplus has become the case in Sweden and Switzerland only since late 2009[25] and mid-2009,[26] respectively.

In two cases (UK, US), the decline in, or the absence of, OMO lending after 2009 is a consequence of non-conventional easing through large-scale outright purchases of domestic assets.

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[23] Attributable to an increase in FX purchases in past three years. As of late 2012, there was more liquidity absorption than injection.

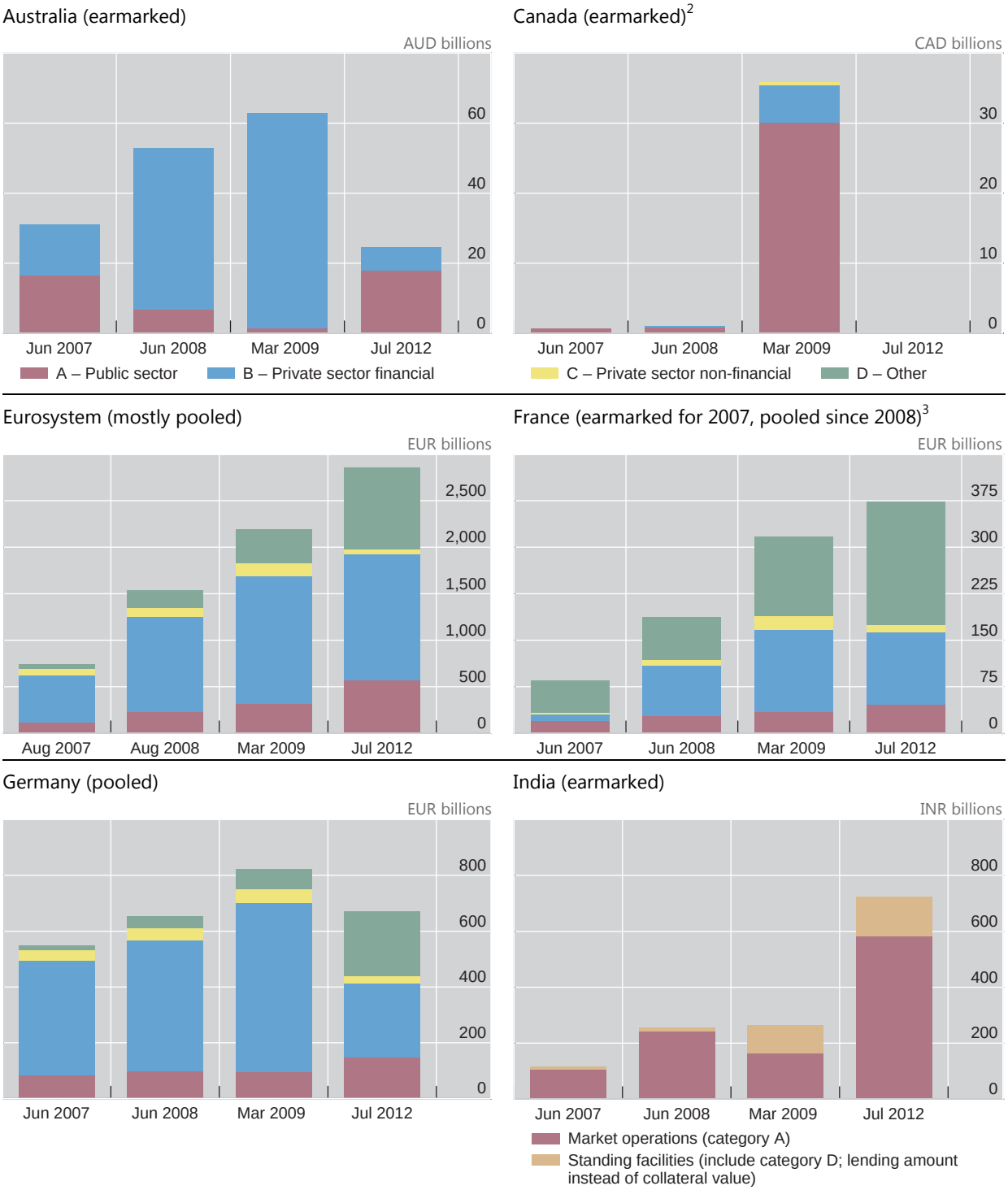
[24] In Korea, there was some lending through OMOs at the height of the crisis, temporarily accepting also bank debentures (category B) and special law bonds (category A, similar to agency securities) as collateral (see the Korea panel in Graph 1).

[25] Prior to September 2008, there were weekly refinancing operations (Monetary Policy Repos) in Sweden. At the height of the crisis, liquidity injection through term loans obviated the need to conduct the weekly repos. Starting late 2009, there was no longer a structural liquidity deficit; hence, even after all the term loans matured in late 2010, the system stayed in surplus, with no need to conduct weekly refinancing repos.

[26] The SNB's large-scale purchases of foreign currency, which started in 2009 and expanded in 2010, led to a substantial liquidity surplus in the banking system.

Amount of collateral pledged to central banks[1]

Collateral value before haircut, by issuer type — Graph 1

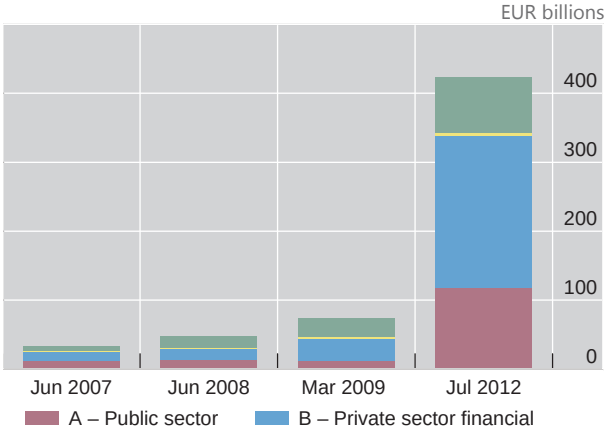


[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [2] There was no collateral in the SF pool on the four dates. [3] Collateral value after haircuts.

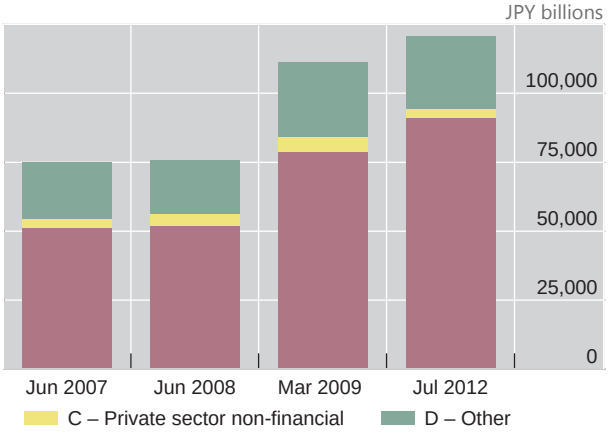
Amount of collateral pledged to central banks (cont)[1]

Collateral value before haircut, by issuer type — Graph 1

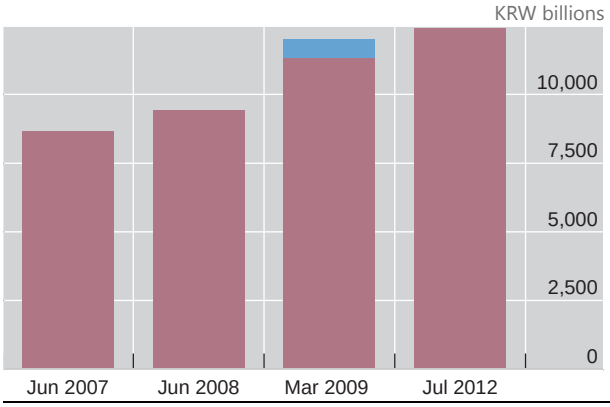
Italy (earmarked for 2007–09, pooled for 2012)



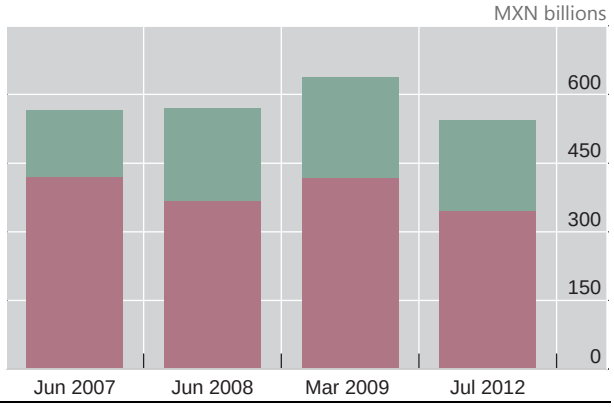
Japan (pooled)



Korea (pooled for SF and earmarked for OMOs)[4]

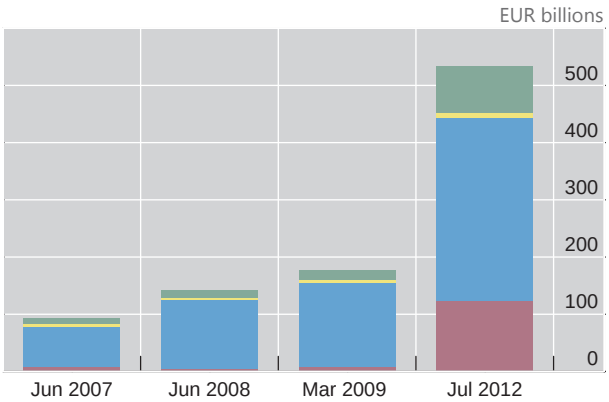


Mexico (earmarked)



Singapore (no lending outstanding)

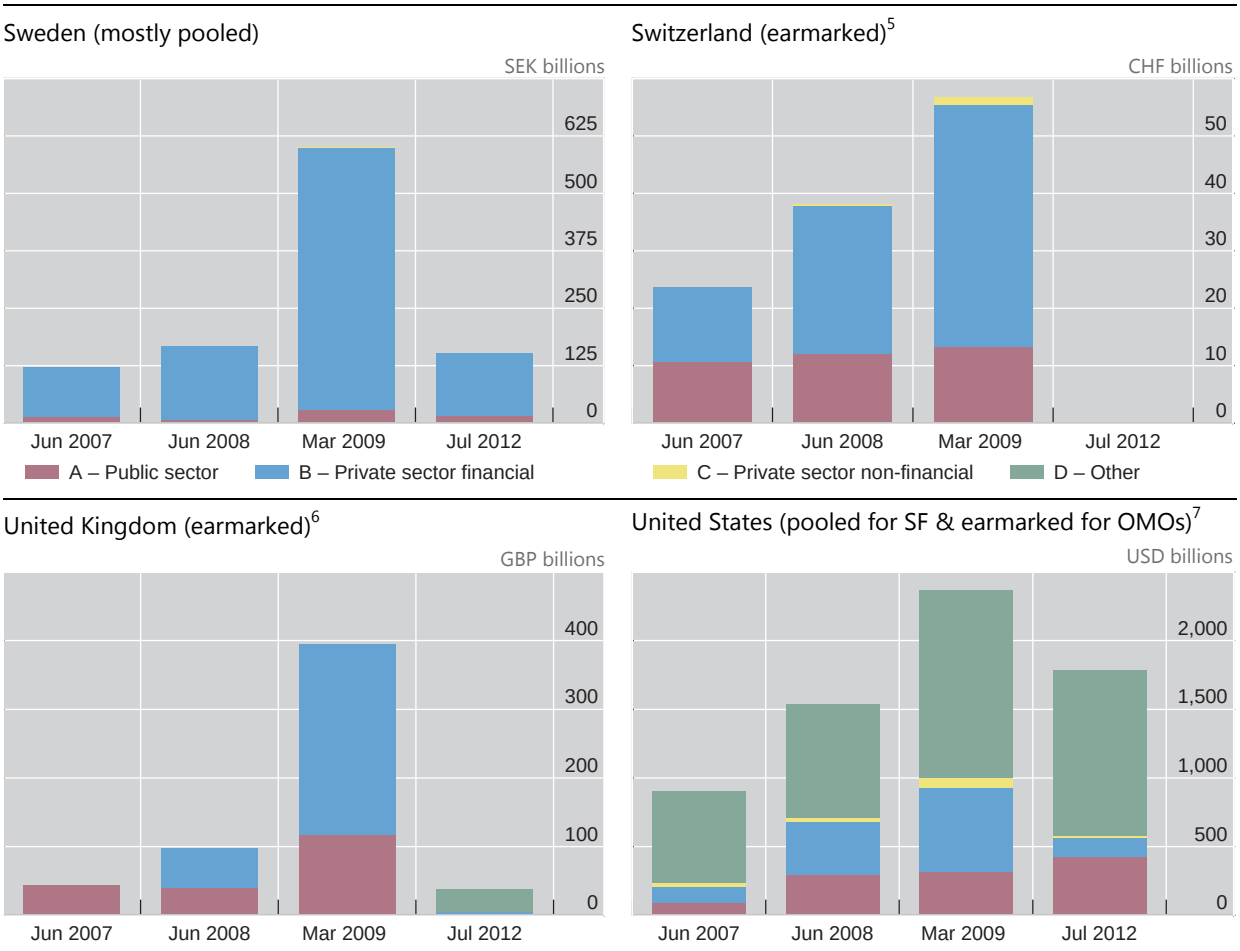
Spain (both pooled and earmarked)



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [4] Essentially all data refer to collateral in the SF pool; there was some earmarked collateral for OMOs only in the 2009 observation.

Amount of collateral pledged to central banks (cont)[1]

Collateral value before haircut, by issuer type — Graph 1



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [5] There was collateral in the SF pool but there was no SF lending outstanding; therefore, the SF pool data are not included. [6] July 2012 data cover only those facilities for which, at the time of writing, aggregate usage had already been disclosed under the Bank of England's normal disclosure schedule. In addition, pledging loans (category D) as collateral may result in very substantial over-collateralisation (or, equivalently, very high apparent haircuts). This is because the portfolios of loans are typically large, and pledged portfolios are encumbered in their entirety. [7] Majority of the total amount refers to collateral in the SF pool, which supports lending via the Discount Window and, for the 2008 and 2009 observations, the Term Auction Facility (TAF). The earmarked collateral in the data is for OMOs and some crisis-era ELA facilities.

In two other cases (Eurosystem, JP), by contrast, non-conventional easing with large-scale term lending has seen the amount of collateral pledged continue to grow after 2009. For the Eurosystem as a whole, the pre-haircut value of the collateral pool at end-July 2012 was over three times that in mid-2007, though not all euro area national central banks exhibit the same pattern and magnitude of lending/collateral growth (see the FR, DE, IT and ES panels in Graph 1). In the case of the BoJ, the growth of the collateral pool over the same period was much less dramatic.

One caveat: as mentioned above, since only four observations are shown for each central bank, care should be exercised in drawing inferences. For example, in India, the large amount of OMO outstanding in July 2012 is more a reflection of volatile autonomous factors (especially, government flows and currency in circulation) than of any underlying trend.

As mentioned above, for central banks with pooled collateral, the size of the pool may not vary one to one with the actual amount of lending. For example, at the Federal Reserve and the Bank of Korea (BoK), the amount of collateral pledged to the pool for standing facilities increased over time, even though actual borrowing is normally very limited. The tendency to pledge extra collateral is related to cost, among other factors.[27] In the case of the Federal Reserve, the opportunity cost of pledging to the pool is low since most of the pool consists of loans, which generally cannot be funded otherwise. For the BoK, the pool consists of public sector securities; but since securities lending in the market is not a main source of profit for counterparties, the opportunity cost of pledging extra collateral is relatively low. In the Eurosystem, which uses mostly pooled collateral for all lending facilities, the size of the pool also tends to exceed actual use (beyond the excess amounts required by the applied haircuts), though the degree of excess varies across counterparties. Some counterparties may find it convenient to keep excess collateral in their Eurosystem collateral accounts (for cost or other reasons). But for counterparties that are under stress, there is less scope for maintaining extra collateral buffers.

2.2 Composition

2.2.1 Data coverage and definition

Table 3 provides an overview of the richness of the data the group has gathered, while being transparent about the cross-country differences in coverage and data definition. Public sector-issued securities (category A) are present for all central banks. Securities issued by private entities – both financial and non-financial – are present in most cases. Non-marketable credit claims and other assets are not as common.

Some of the asset types included in the data became eligible collateral only *during* the financial crisis. As such, these asset types only appear in the 2008 and/or 2009 observations and have since declined in relevance or completely disappeared. For example, except in some euro area countries, bank debt guaranteed by government schemes set up in the wake of the Lehman bankruptcy have declined in importance as collateral, as these schemes have already expired and most, if not all, of the guaranteed debt has already matured.

[27] There may be operational, precautionary or supervisory reasons to pledge more collateral to the pool. For instance, counterparties may find it convenient to hold extra collateral if the collateral pool can be used for intraday liquidity (for everyday payment system purposes) as well as for other lending facilities.

Coverage and definition of the collected collateral data

Sample dates: end-June 2007, end-June 2008, end-March 2009 and end-July 2012[1] Table 3

	A – Public sector	B – Private sector financial	C – Private sector non-financial	D – Other	Definition of data (type of collateral included in data)
Australia	Gov, supra	ADI bonds and bills, securities w/ government guarantee, ABCP and RMBS	Private sector AAA		Collateral value before haircuts (earmarked)
Canada	Gov, gov-guaranteed	Banks and credit companies, bank BAs, bank ABCP	Private sector		Collateral value (earmarked)[2]
Eurosystem	Gov, CB, supra, agency	Credit institution (unsecured, covered, guaranteed), other financial corp (ABS)	Corp and other	Credit claims and RMBD,[3] fixed-term/cash deposit	Collateral value before haircuts (mostly pooled)
France	Gov, supra, agency	Covered, unsecured, ABS	Debt instruments issued by non-financial corp and other issuers	Non-marketable credit claims	Collateral value after haircuts[4] (earmarked for 2007, pooled since 2008)
Germany	Gov, supra, agency	Covered, unsecured, ABS, gov-guaranteed bank bonds	Corp debt	Non-marketable credit claims, fixed-term deposits, CB	Collateral value before haircuts (pooled)
Italy	Gov, supra, agency	Covered, unsecured, ABS, gov-guaranteed bank bonds	Corp debt	Non-marketable credit claims, fixed-term deposits	Collateral value before haircuts (earmarked for 2007–09, pooled for 2012)
Spain	Gov, supra, agency	Covered, unsecured, gov-guaranteed bank bonds, ABS	Obligations of non-financial entities	Non-marketable assets, other marketable	Collateral value before haircuts (both pooled and earmarked)
India	Gov			Export credit (for one of the SFs only)	Collateral face value for A (for OMOs), lending amount for D (for SF) (earmarked)
Japan	Gov, agency, gov-guaranteed	Obligations of real estate investment company	Corp bonds, bills	ABS and ABCP[5], loans on deeds	Collateral face value (pooled)

Combined coverage for the four sample dates (ie not every asset type is necessarily present for all dates); see Graphs 1 and 3 for more information on quantities.

[1] Except for the Eurosystem-wide data: early August 2007 and end-August 2008, instead of end-June.

[2] There was no collateral in the pool for standing facilities on the four dates.

[3] RMBD = retail mortgage-backed debt instruments, non-marketable debt instruments (eg promissory notes) backed by mortgages; currently only used in Ireland.

[4] Historical series of pre-haircut data are incomplete; post-haircut data are used instead for better quality.

[5] ABS and ABCP are put in category D only because the identity of issuers is not supposed to be disclosed.

Coverage and definition of the collected collateral data (cont)

Sample dates: end-June 2007, end-June 2008, end-March 2009 and end-July 2012 Table 3

	A – Public sector	B – Private sector financial	C – Private sector non-financial	D – Other	Definition of data (type of collateral included in data)
Korea	Gov, CB, gov-guaranteed, special law bonds	Bank debentures		Credit claims (for SF only)	Collateral value (both pooled for SF and earmarked for OMOs)[6]
Mexico	Gov, agency, CB			Deposits with CB	Collateral value incl margins and accrued interest (earmarked)
Singapore	No lending outstanding at all four sample dates				
Sweden	Gov, CB, supra, agency	Covered, state-guaranteed, unsecured, ABS	Unsecured		Collateral value (mostly pooled)
Switzerland	Gov, supra, cantons, federal states, provinces, gov agency	Banks and credit institutions (incl covered, unsecured)	Private sector entities		Collateral value (earmarked)[7]
United Kingdom	Sovereigns, supra	Covered bonds, RMBS, ABS, CMBS, ABCP		Loans	Collateral value (earmarked)
United States	Gov, agency, agency-backed MBS/CMO, supra, muni	MM instruments (CP, CDs, BAs), corp securities, covered bonds, securitised products (non-agency MBS/CMO, CMBS, ABS, ABCP, etc)	Corp securities, equity, CP	Non-marketable loans, cash, Term Deposit Facility reserves	Collateral value[8] (both pooled for SF and earmarked for OMOs)[9]

Combined coverage for the four sample dates (ie not every asset type is necessarily present for all dates); see Graphs 1 and 3 for more information on quantities.

[6] Essentially all data refer to collateral in the SF pool; there was some earmarked collateral for OMOs only in the 2009 observation.

[7] There was collateral in the SF pool but there was no SF lending outstanding; therefore the SF pool data are not included.

[8] Collateral value for SF, cash value for OMOs.

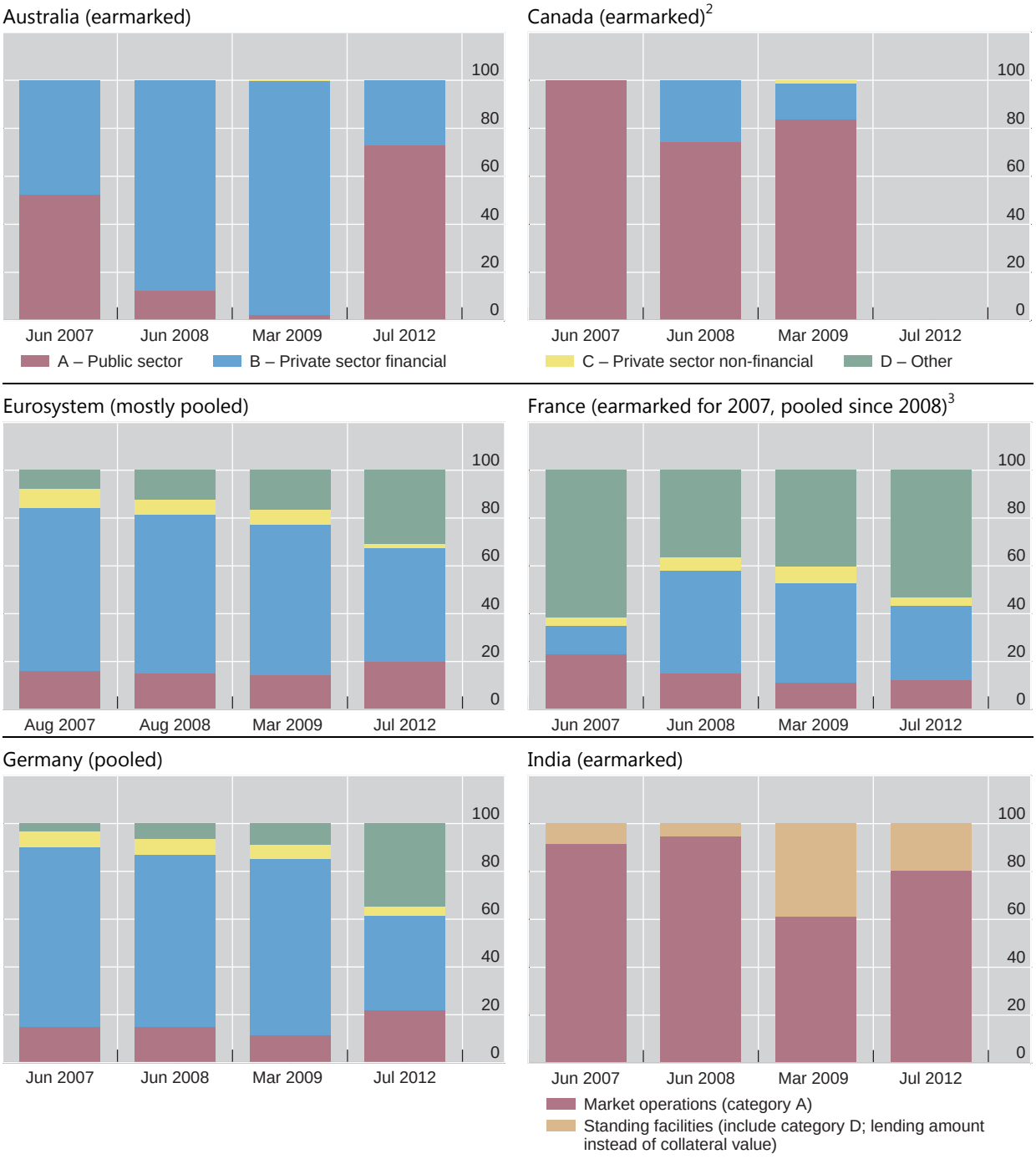
[9] Majority of the total amount refers to collateral in the SF pool, which supports lending via the Discount Window and, for the 2008 and 2009 observations, the Term Auction Facility (TAF). The earmarked collateral in the data is for OMO and some crisis-era ELA facilities.

2.2.2 Variation in composition

Graph 2 shows the composition of collateral pledged to central banks, in terms of the percentage shares of the four main categories. There are considerable variations in composition not only across central banks but also across time. The experiences of the central banks in the sample can be roughly categorised as in Table 4.

Composition of collateral pledged to central banks[1]

Percentage share by issuer type — Graph 2

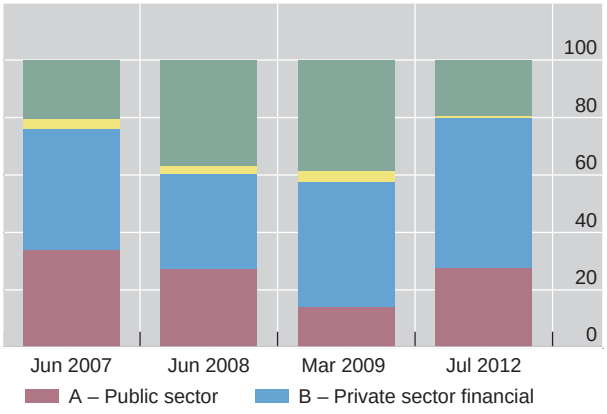


[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [2] There was no collateral in the SF pool on the four dates. [3] Based on collateral value after haircuts.

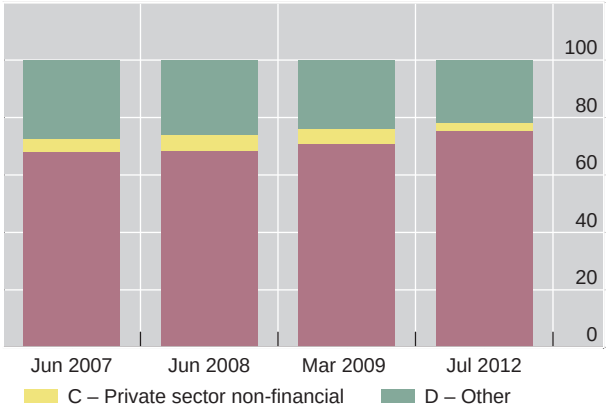
Composition of collateral pledged to central banks (cont)[1]

Percentage share by issuer type — Graph 2

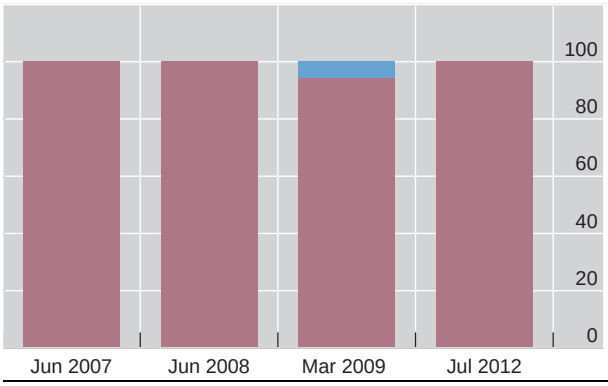
Italy (earmarked for 2007–09, pooled for 2012)



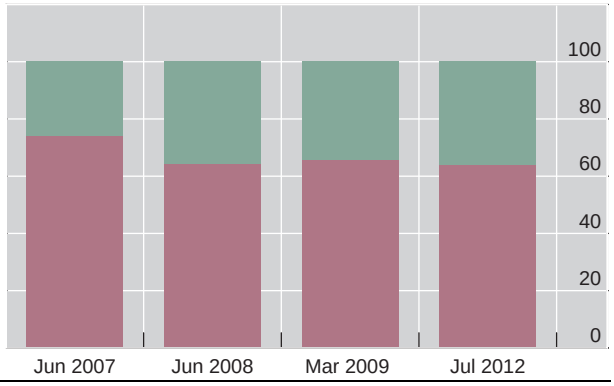
Japan (pooled)



Korea (pooled for SF & earmarked for OMOs)[4]

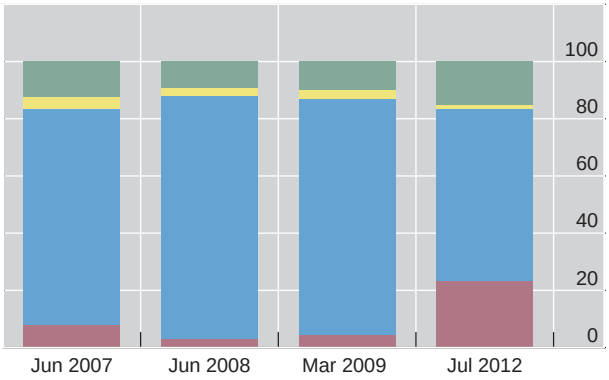


Mexico (earmarked)



Singapore (no lending outstanding)

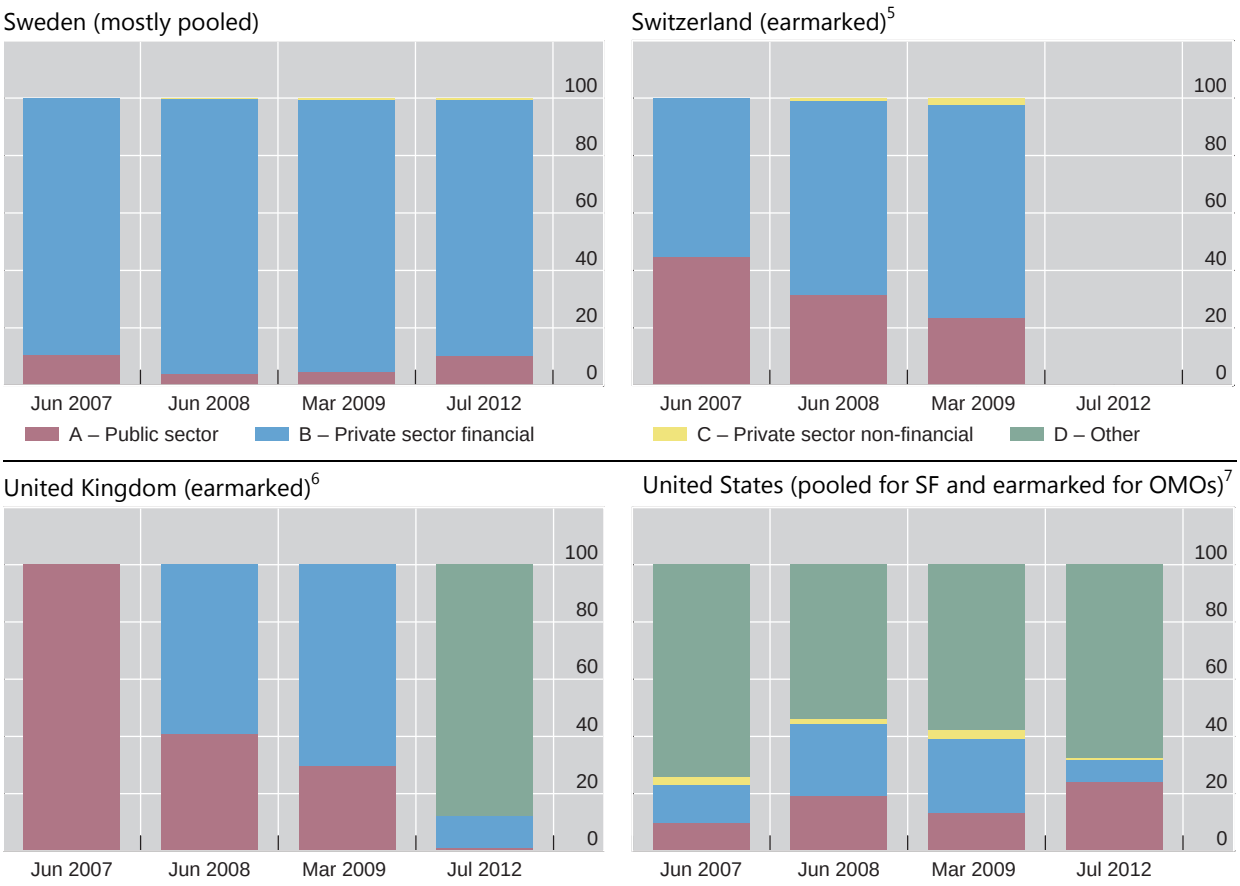
Spain (both pooled and earmarked)



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [4] Essentially all data refer to collateral in the SF pool; there was some earmarked collateral for OMOs only in the 2009 observation.

Composition of collateral pledged to central banks (cont)[1]

Percentage share by issuer type — Graph 2



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions. [5] There was collateral in the SF pool but there was no SF lending outstanding; therefore, the SF pool data are not included. [6] July 2012 data cover only those facilities for which, at the time of writing, aggregate usage had already been disclosed under the Bank of England's normal disclosure schedule. In addition, pledging loans (category D) as collateral may result in very substantial over-collateralisation (or, equivalently, very high apparent haircuts). This is because the portfolios of loans are typically large, and pledged portfolios are encumbered in their entirety. [7] Majority of the total amount refers to collateral in the SF pool, which supports lending via the Discount Window and, for the 2008 and 2009 observations, the Term Auction Facility (TAF). The earmarked collateral in the data is for OMOs and some crisis-era ELA facilities.

Looking across central banks at a given point in time

It is not surprising to see central banks with relatively narrow collateral frameworks receive predominantly one category of collateral (typically A), while those with wider frameworks receive a more varied set. However, it does not follow that counterparties always need to fully utilise wide collateral eligibility or that they always tend to pledge the least liquid collateral to the central bank (see below). For example, despite a relatively broad framework, the BoJ tends to receive category A assets (around 70% of total). The relative abundance of government securities may have lessened the need to use other types of collateral in this case.

A number of central banks tend to receive mostly private sector securities instead, especially category B, which may contain unsecured, secured and/or guaranteed securities. Graphs 3 and 4 provide further details on the amount and composition of the private sector securities (categories B and C) pledged to central banks. The diversity is apparent. For example, of the private sector securities pledged to the Riksbank, essentially all are domestic covered bonds. In contrast,

private sector securities pledged to the Eurosystem are much more varied, with unsecured bonds, covered bonds, ABS and later also guaranteed debt securities.[28]

Looking at specific central banks across time

Collateral composition for some central banks is relatively stable (eg JP, SE, CH) – in some cases because the collateral framework has remained relatively narrow (eg IN, KR, MX). For some other central banks, however, collateral composition did change noticeably over time. For example, the share of category A collateral at the RBA shrank significantly during the crisis, overtaken by category B (first unsecured bank debt and later RMBS and ABCP), but it has since returned to more or less its pre-crisis norm (see Graph 2). Similarly, the composition of earmarked collateral used in the Federal Reserve's lending operations and facilities (excluding the Discount Window) became more mixed during the crisis. After taking into account the collateral pool for the Discount Window, however, the overall composition is dominated by category D. The BoE provides yet another example of significant shifts in collateral composition over time (from all public sector securities, to mainly covered bonds and other asset-backed instruments, to mainly loans).

Although changes in eligibility during the crisis may have been responsible for the variations in collateral composition at some central banks, changes in the market environment have also played a role. In the Eurosystem, for example, falls in asset prices, rating downgrades and a difficult environment for issuing unsecured debt in the past few years have prompted greater use of certain asset types, including government bonds, covered bonds and government guaranteed bank debt, as collateral.

Evolution of collateral composition

Based on the four asset categories in the collected collateral data — Table 4

	Pre-crisis, Jun 2007	2008–09	Jul 2012
Mainly (≥50%) A	CA, IN, JP, KR (for SF pool), MX, UK	CA, IN, JP, KR, MX	AU, IN, JP, KR (for SF pool), MX
Mainly A+B (similar shares)	AU, IT		IT
Mainly (≥50%) B	Eurosystem, DE, ES, SE, CH	AU, Eurosystem, DE, ES, SE, CH, UK	ES, SE (SF only)
Other	FR (mainly D), US (mainly D if Discount Window pool included, mainly A if excluded)	FR (mainly B+D), IT (mainly B+D), US (mainly D if Discount Window pool included, mixed if excluded)	Eurosystem (mainly B+D), FR (mainly D), DE (mainly B+D), UK (category D), US (mainly D in Discount Window pool)
Special cases	KR,[1] SG[2]	SG[2]	CA,[2] KR,[1] SG,[2] CH,[2] US[1]

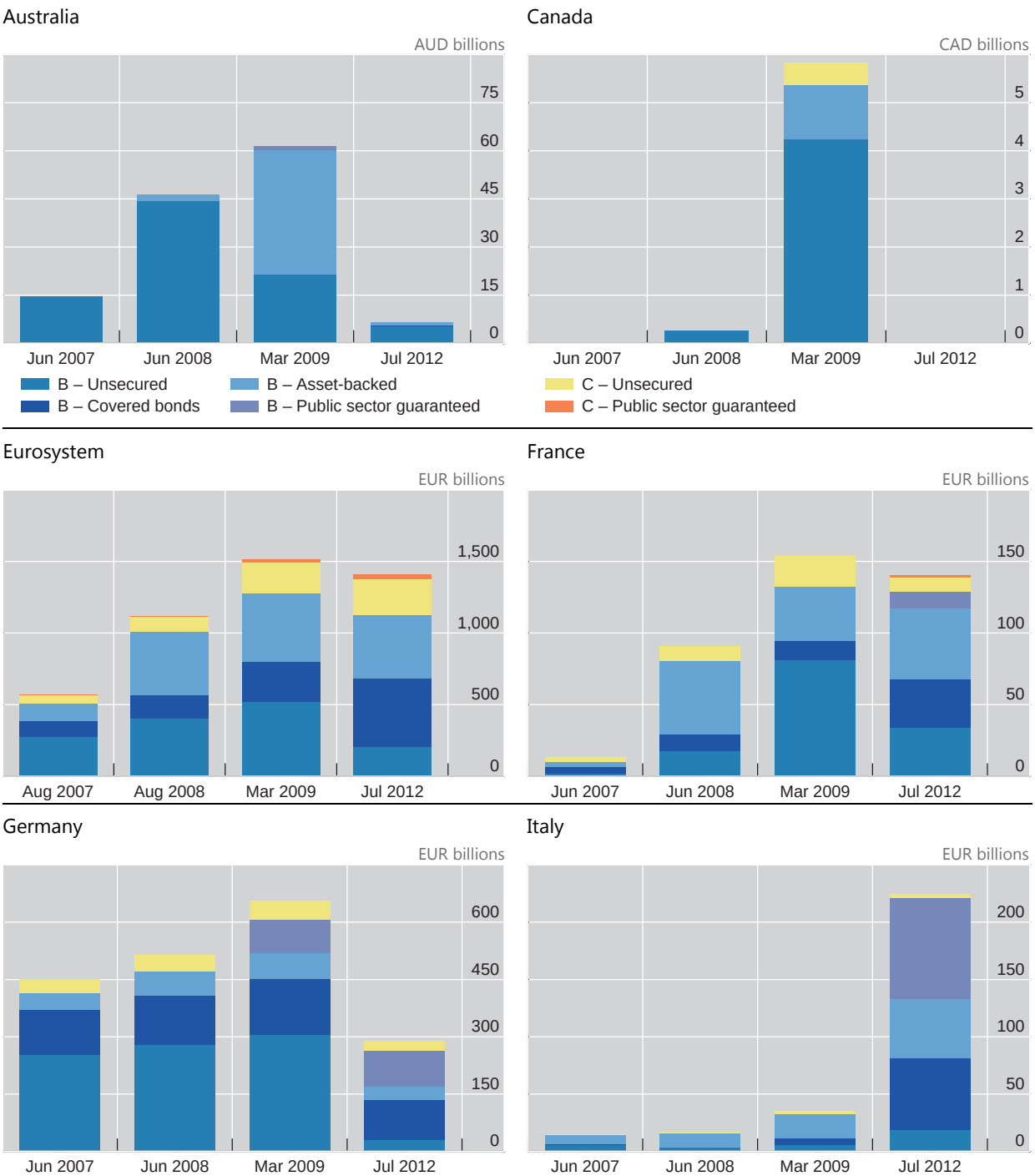
[1] No repo OMOs outstanding at the relevant sample date(s).

[2] No central bank lending (whether OMO or SF) outstanding at the relevant sample date(s).

[28] The relative shares of different sub-types of private sector securities can vary considerably across euro area national central banks (see the FR, DE, IT and ES panels in Graphs 3 and 4).

Amount of private sector-issued securities pledged to central banks[1]

Collateral value before haircut, by issuer and security sub-type — Graph 3

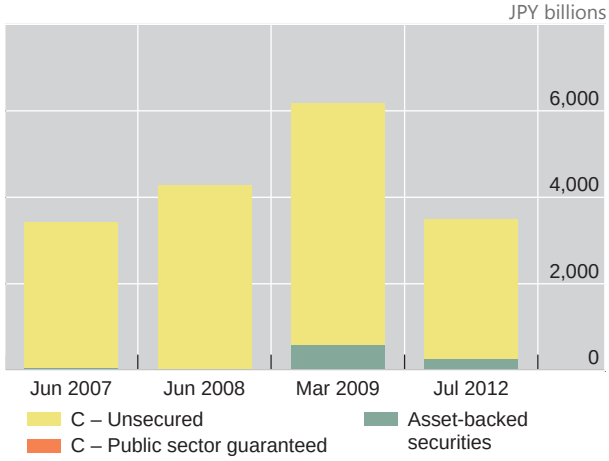


[1] See Table 3 for more information on the coverage of asset sub-types and data definitions.

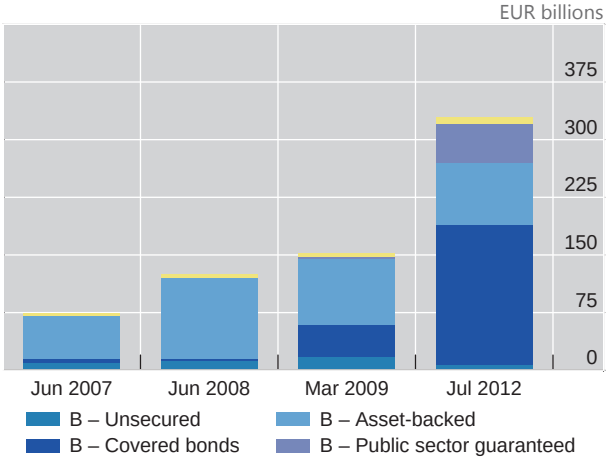
Amount of private sector-issued securities pledged to central banks (cont)[1]

Collateral value before haircut, by issuer and security sub-type — Graph 3

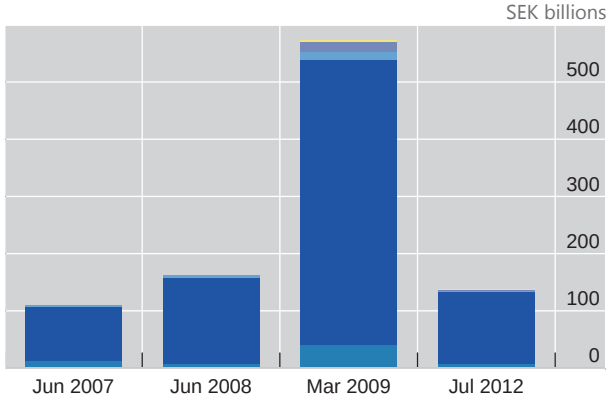
Japan



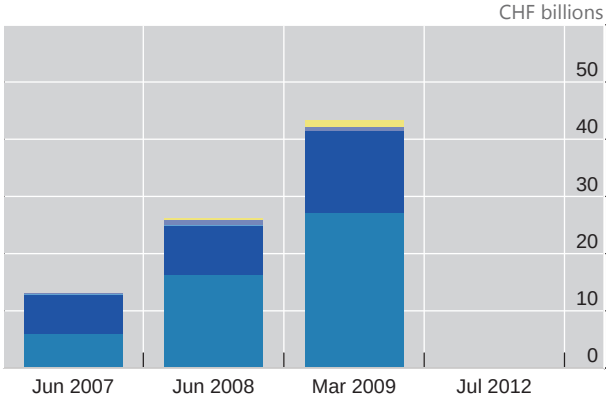
Spain



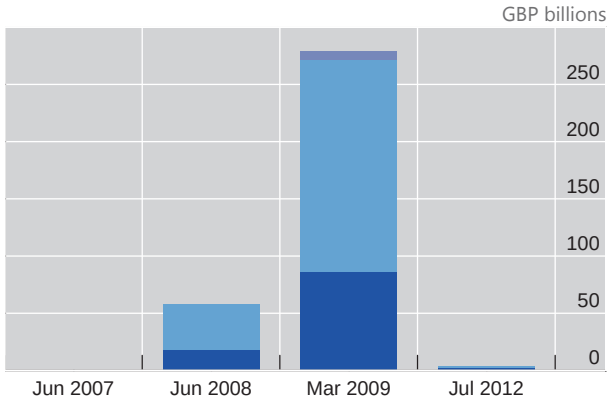
Sweden



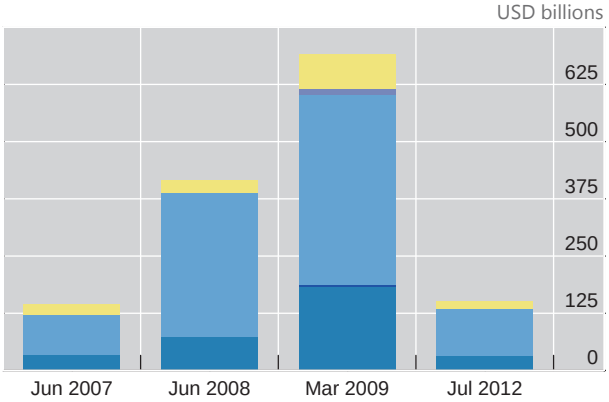
Switzerland



United Kingdom



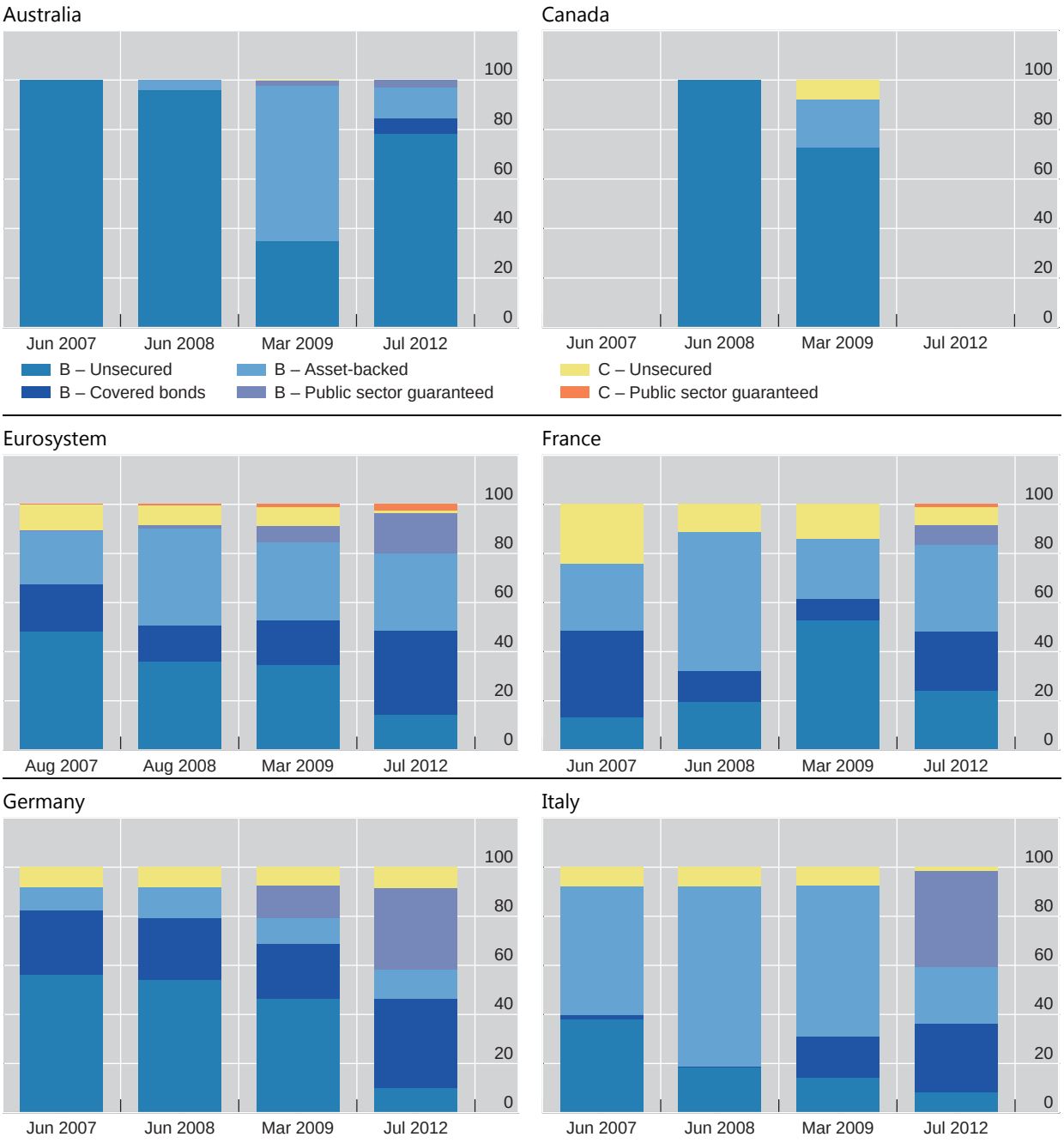
United States



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions.

Composition of private sector-issued securities pledged to central banks[1]

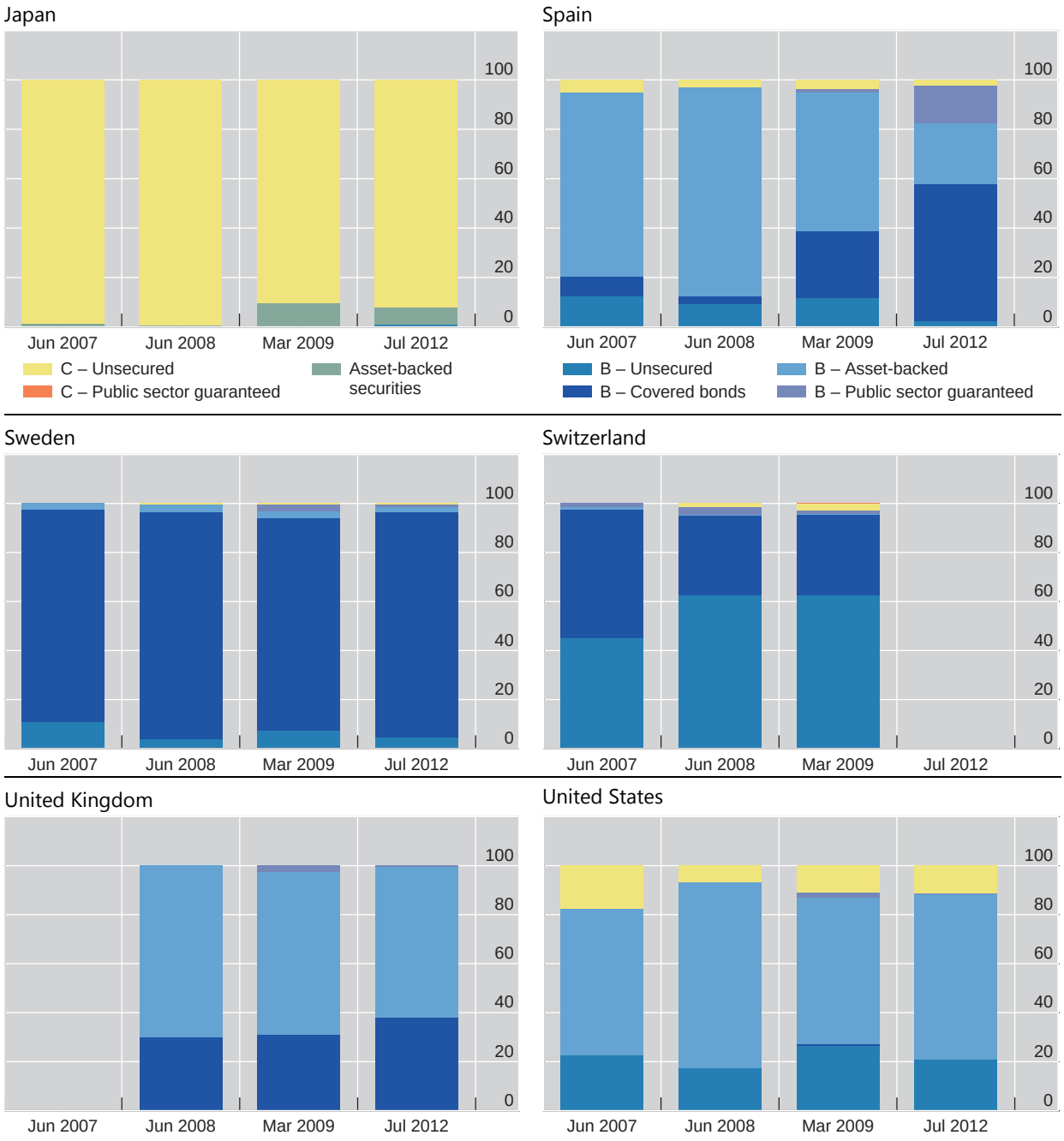
Percentage share by issuer and security sub-type — Graph 4



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions.

Composition of private sector-issued securities pledged to central banks (cont)[1]

Percentage share by issuer and security sub-type — Graph 4



[1] See Table 3 for more information on the coverage of asset sub-types and data definitions.

Tendency to pledge less liquid collateral?

At central banks with broad collateral eligibility, the tendency for counterparties to increase the use of less liquid assets as collateral during *stressed times* can be observed. As the ability to obtain market funding wanes or even vanishes, counterparties have a greater need to access central bank liquidity. In this environment, the opportunity cost of bringing less liquid assets to the central bank may fall, given that these assets are no longer as valuable in the market. On the other hand, some less liquid assets could be downgraded and lose eligibility. This would force counterparties to revert to using the relatively more liquid assets that are still eligible.

In *less volatile times*, however, it seems that wider eligibility does not necessarily always attract less liquid collateral. The collateral composition discussion above suggests that counterparties in some jurisdictions with broad collateral eligibility do not always exploit the full range of eligible collateral. At times when there is relatively little need for central bank credit, the liquid assets held by counterparties may already suffice and there is no need to resort to using less liquid assets.

More importantly, central banks can influence the relative cost of using liquid versus less liquid eligible assets through their choice of valuation method, haircuts/initial margins and pricing of lending facilities. In *uniform* frameworks that do not differentiate collateral eligibility by lending facility, the haircuts or margins affect this relative cost. In *differentiated* frameworks, an additional layer of cost can be imposed by making the facilities that accept less liquid collateral more expensive. Furthermore, quantity measures such as concentration limits on particular types of assets can also preclude (or at least increase the cost of) the use of such assets beyond a certain point.

Apart from changing market conditions and central banks' own collateral rules, financial sector regulations may also affect counterparties' incentive to use less liquid collateral. Ideally, collateral rules and liquidity and capital rules would be consistent with each other in order to prevent regulatory arbitrage, but differences in domestic financial structures and practices mean that this consistency is not always possible. One example is the implications of the new Basel III liquidity standards for central bank operations. Central banks in jurisdictions with domestic rules that are in line with (or even more restrictive than) the new Basel rules are less concerned about regulatory arbitrage than central banks in other jurisdictions. As other regulatory reforms are gradually being implemented, the overall impact on central bank counterparties' incentives to use different types of collateral will become more apparent. But as discussed above, central banks have the option of adjusting the parameters of their collateral policies and/or the pricing of their lending operations and facilities so as to discourage undesirable behaviour among counterparties.[29]

[29] For example, central banks could in principle deter arbitrage between regulatory liquidity requirements and their own collateral rules by raising the cost of using less liquid assets as collateral at their lending facilities (eg through higher haircuts). However, from a pure risk management perspective, central banks may find it preferable to accept less risky assets (with smaller haircuts) in order to limit "tail risks".

2.3 Implications for collateral use in the market

Collateral use at central banks influences collateral practices in the market.

One longer-term influence comes from the design of central bank collateral policies. In some jurisdictions, central bank collateral essentially sets the market standard. For example, in Switzerland, more than 99% of all repo transactions in the prevailing interbank repo market are covered by SNB-eligible collateral. It is also not uncommon to see central bank collateral policies designed with a view to facilitating market development. For example, the MAS now includes as eligible collateral, SGD-denominated AAA securities issued by public sector entities other than the Singapore government. By taking the lead in accepting these securities, the central bank makes it potentially more attractive for the private sector to hold these securities; greater demand could eventually attract more issuance from high-grade foreign issuers and in turn develop a deeper market.[30] Another example is the BoC's acceptance of certain ABCP since 2008. With not only eligibility criteria but also additional disclosure requirements, this policy intends to help develop a well functioning market for ABCP by promoting more transparency in these securities.[31]

The progression of some central banks, such as the RBA and the BoE, to accept pools of loans as collateral in some lending facilities is also driving changes in the market.[32] The use of loan pool collateral can create a more flexible and efficient mechanism for enabling collateral, and is reducing the extent to which asset-backed securities need to be structured specifically for use in central bank operations.

In some other economies, however, one prominent (but arguably temporary) influence is non-conventional central bank policies. All else being equal, such large-scale operations – whether collateralised (term) lending or outright purchases – take assets out of the market. But at the same time, these operations are injecting significant amounts of liquidity into the system, reducing the need for at least some counterparties to borrow (and thus use collateral) in the market. Ultimately, whether or not large-scale central bank operations induce a shortage of collateral has to be assessed also against the supply of collateral.

As mentioned in Section 1, in addition to the traditional type of securities lending intended for bond market-makers, there are now some central bank securities lending facilities that are designed for liquidity insurance purposes. These can help alleviate temporary shortages of high-quality securities in the market.

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30 Some of the extraordinary lending facilities adopted by major central banks during height of the global financial crisis in 2008–09 are essentially also based on this rationale, though applied to less highly rated securities.

31 See www.bankofcanada.ca/2008/03/notices/eligibility-criteria-conditions-accepting-asset-backed-commercial/ for more details.

32 The RBA will accept "self-securitised" assets (ie securitised portfolios of loans that remain on banks' balance sheets) on a case by case basis in its new Committed Liquidity Facility (CLF) as part of Australia's implementation of the Basel III liquidity reforms. The BoE accepts, among other eligible assets, portfolios of certain types of loans to non-banks in its Discount Window Facility.

Concluding remarks

Central banks' collateral policies have evolved through time in response to changing operational needs and financial market developments. But the experience in the five-year period beginning in mid-2007 provides ample motivation for central banks to review and update their collateral practices.

Lessons have been learned regarding the magnitude, scope and duration of market strains, the relative effectiveness of different policy tools, including some novel ones, and the performance of different asset classes in a stressed market environment. As a result, one can observe some common aspects in the recent evolution in collateral policies across central banks. These include the acceptance of more asset types, including cross-border collateral in some jurisdictions, and the increased granularity of haircut/initial margin schedules.

The extent of change varies, however, reflecting in part the degree to which different financial systems have been subject to financial stress in recent years. But even in jurisdictions that have experienced considerable financial stress, not all of the changes in central bank collateral policies have resulted directly from crisis management. Policy changes have also resulted from periodic reviews of other factors – institutional, structural, developmental, legal and historical – which also affect the choice of collateral frameworks over the longer term.

The aim of this report is to provide an organising framework for characterising different central banks' collateral policies. By instilling some structure, one can more easily identify the common elements that underpin central bank collateral policies, as well as the jurisdiction-specific features that result in the observed differences. This can facilitate a more coherent and meaningful discussion of collateral policy considerations and their impact on market functioning.

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	Lucas Marc Fuhrer
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	Deborah Leonard
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