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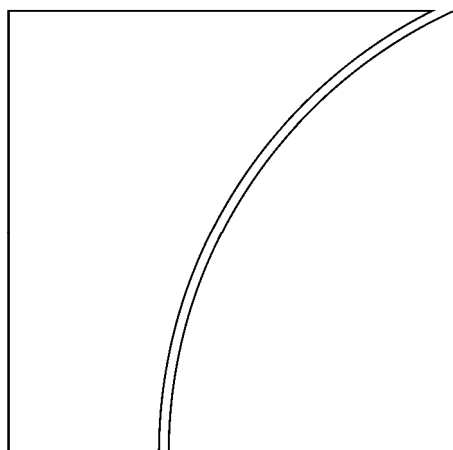
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# An assessment of financial sector rescue programmes

Fabio Panetta, Thomas Faeh, Giuseppe Grande, Corrinne Ho, Michael King, Aviram Levy, Federico M Signoretti, Marco Taboga and Andrea Zaghini

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## Introduction and executive summary<sup>1</sup>

Since the crisis intensified in September 2008, following the collapse of Lehman Brothers, governments in advanced economies have stepped in to provide support to banks and financial institutions, through both standalone actions directed at individual institutions and system-wide programmes. The measures introduced have consisted of: (i) capital injections to strengthen banks' capital base; (ii) explicit guarantees on liabilities to help banks retain access to wholesale funding; and (iii) purchases or guarantees of impaired legacy assets to help reduce banks' exposure to large losses.<sup>2</sup> The objective of such intervention was to avoid widespread bankruptcies of financial intermediaries and to contribute to restoring a normal functioning of financial intermediation.

This paper provides an overview of the government support measures introduced between September 2008 and June 2009 and an account of their effects on banks and on the functioning of credit and financial markets.

## Overview of the support measures

Governments became crucial during the crisis, as traditional sources of funding for financial institutions dried up. Banks' issuance of debt securities and equity instruments dropped off considerably in the third and fourth quarters of 2008. Bank mergers and acquisitions, which could have provided a private sector solution to bank restructuring, also remained subdued.

Against this background, the magnitude of the actions taken to support the banking system has been unprecedented. The overall amount of resources committed to the various packages by the 11 countries examined<sup>3</sup> totalled around €5 trillion or 18.8% of GDP; the outlays have been €2 trillion or 7.6% of GDP. The size of the interventions varies greatly across countries: it is higher in countries such as the United Kingdom and the Netherlands (where outlays have reached 44.1% and 16.6% of GDP, respectively) where the banking system is large relative to the real economy and is dominated by large institutions that have been severely hit by the crisis. It is lower in countries such as Japan (0.1% of GDP) and Italy (0.6%) where banks are more focused on traditional credit activities and so far have been less affected by the crisis.

Actions for addressing capital shortages and funding difficulties have been widespread and have mostly taken the form of system-wide programmes. Measures for improving the quality of bank assets have been less common and have mainly targeted individual large institutions. However, some of the most recent initiatives include comprehensive schemes for dealing with illiquid or "bad" assets. Among banks that participate in both recapitalisation and debt guarantee programmes, the intermediaries that have received more capital (in relation

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<sup>1</sup> Fabio Panetta (fabio.panetta@bancaditalia.it), Giuseppe Grande, Aviram Levy, Federico M Signoretti, Marco Taboga and Andrea Zaghini are from Banca d'Italia. Thomas Faeh, Corrinne Ho and Michael King are from the Bank for International Settlements. Some of the analyses reported in this paper were initially carried out with a view to providing inputs to the activity of the Committee on the Global Financial System. We are indebted to Leonardo Gambacorta for his contribution at the early stage of the project. Andrea Cardillo, Reto Hausmann and Mario Sanna provided excellent research assistance; thanks are also due to Angelika Donaubaue for graph production and to Thekla Grimm, Cynthia Lloyd and Tom Minic for editorial assistance. All errors are our own.

<sup>2</sup> A number of countries have also strengthened their deposit insurance scheme to help prevent bank runs.

<sup>3</sup> Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, the United Kingdom and the United States.

to shareholder equity) have also issued more liabilities under guarantee (in relation to total liabilities). Moreover, most instances of asset purchase/guarantee occurred after earlier capital injections, suggesting that this option was used after a first phase of government support failed to fully restore confidence in troubled institutions.

The average uptake rate by eligible institutions (ie the ratio of outlays under a given programme to total commitments) is higher for capital injections (around 50%) than for debt guarantees (less than 20%). The United Kingdom has the highest participation rate for both capital injections and debt guarantees, possibly reflecting the relatively small number of major banks and the tailoring of government programmes to their needs. A small number of ready-to-use programmes have seen zero participation so far.

For debt guarantees, the flat-fee scheme implemented in the United States – more favourable, in principle, for riskier banks than the European schemes, where fees vary with the bank's riskiness – did not induce a higher participation rate: indeed the US uptake ratio is lower than the average one for the European countries included in the sample.

## **The effects on bank risk and valuation**

Have government measures contributed to restoring the soundness of and confidence in the banking system? Analysing CDS premia for large international banks, our main findings are:

- (i) Government interventions have been effective in reducing banks' default risk, at least over a short time horizon. On average, the announcement of system-wide rescue packages was followed by a fall in CDS premia, especially for announcements of capital injections.
- (ii) Bank CDS premia have shown a further reduction when the government measures were actually implemented, under both comprehensive rescue programmes and standalone initiatives.
- (iii) The reduction of default risk is correlated with the amount of resources pledged, in particular with the size of capital injections.
- (iv) There seem to be positive spillover effects across countries: some countries' CDS spreads showed "early declines" after the announcements of packages by others.

Unlike CDS premia, bank stock prices in general did not show a positive reaction to the announcement of the rescue packages. Although in some countries immediately after the announcements banks' equities showed a slightly positive reaction, in all cases prices eventually fell to levels substantially below the pre-announcement levels. This may reflect several factors. First, capital injections at low prices substantially dilute investors' earning rights (ie the right to get a fraction of future earnings), thus penalising existing shareholders. In some cases, governments intervened by subscribing common stock, thus also diluting shareholders' voting rights. Second, concerns about national governments becoming important stakeholders might have negatively affected investors' perception of banks' long-run profitability, thus contributing to the depression of market prices. Finally, uncertainty regarding the duration of the interventions and the lack of a credible exit strategy for governments might have increased uncertainty, thus raising the risk premium on banks' equities.

Overall, our analysis suggests that rescue packages have contributed to reducing banks' probability of default, to the benefit of creditors and CDS protection sellers. This result has



been achieved in part by redistributing resources from shareholders to creditors, as it emerges from the opposite reactions of banks' CDS premia and stock prices.<sup>4</sup>

## Government-guaranteed bond issuance by banks

We then analyse the issuance of government-guaranteed bonds by banks and draw the attention to, inter alia, a number of undesired side effects and distortions related to such guarantees.

The issuance of guaranteed bonds has been sizeable across regions and has provided banks with an important source of funding: as of May 2009, roughly 900 bonds totalling around the equivalent of €700 billion had been issued worldwide by 140 financial institutions. The guarantees have allowed banks to refinance maturing debt, although the intensity of the rollover differs across intermediaries and countries. For some 50 banks which had bonds maturing over the period examined (October 2008–May 2009), the median rollover ratio was 1.5 (ie issuance of guaranteed debt was equal to one and a half times the amount of matured non-guaranteed debt). At the country level, the median ratio ranged from 0.5 in Germany to 8.5 in the United Kingdom.

As mentioned, the guarantees may have caused undesired side effects or even distortions.

First and foremost is the significant tiering of spreads at issuance paid by banks from different countries. Banks with the same rating but different nationality have paid markedly different spreads. In some cases, banks with a better rating have paid much larger spreads than banks with a lower rating. We show that these differences can be quite large. For example, for bonds issued by banks rated A, the range is close to 80 basis points (from 20 basis points for some US banks to 100 basis points for some Spanish banks).

Econometric analysis indicates that the differences between the spreads paid by individual banks reflect to a large extent the characteristics of the sovereign guarantor (such as its rating or the timeliness of payments in case of default of the issuer), whereas bank-specific factors (such as its credit risk) play only a minor role. This finding represents an example of the distortions that may stem from government intervention, because it implies that “weak” banks from “strong” countries may have access to cheaper funding than “strong” banks from “weak” countries. Such a pricing of risk is not what one would expect in a well functioning and efficient market.

The paper also highlights other types of possible side effects of the guarantees. First, guaranteed issuance may have come at the expense of (ie crowded out) non-guaranteed issuance – less so in the euro area, where issuance of both asset classes has moved together, and in the United States; more so in the case of the United Kingdom, especially after January 2009. Second, a large portion of the guaranteed bonds have been issued by large banks, which have also recorded very large volumes of writedowns. This might suggest that the rescue programmes may be de facto subsidising large and complex financial institutions, which according to some commentators were at the root of the ongoing crisis and may be less likely to use the funds raised to increase lending to the real economy. Third, survey and market information on the investor base of guaranteed bonds in the euro area indicates that a large portion of guaranteed bonds (much larger than for non-guaranteed

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<sup>4</sup> This redistribution of resources could be considered unfair towards shareholders. However, shareholders bear non-negligible responsibilities for the eruption of the financial crisis, due to their insufficient monitoring of the banks they owned. Moreover, in order to attain the ultimate goal of rescuing banks, governments might have had no choice but to protect creditors (bondholders and depositors) at the expense of shareholders, in view of the fact that debt represents a much larger portion of banks' liabilities than equity.

bank bonds) is bought by domestic investors, in particular banks. This may signal that guaranteed bonds are contributing to a partial re-segmentation of the euro area bond market and, as far as the major role of banks among investors is concerned, that these bonds may not be stimulating lending to the real economy but just lending to other banks.

## **Effects on the supply of bank credit**

The paper provides some background information which may be useful for assessing whether rescue measures are proving effective in supporting credit supply to the private sector, which is their ultimate objective. This kind of assessment is fraught with conceptual and statistical pitfalls, related, *inter alia*, to the very short sample period available, to the difficulty of disentangling the effects of rescue measures from those of other factors at work (some of them policy-related) and to the fact that lending policies reflect several bank characteristics, only some of which are observable. Subject to these caveats, evidence from aggregate credit data shows that, at the end of 2008 and in early 2009, bank lending to firms and households kept slowing both in the United States and in Europe. Evidence from lending surveys and from loan pricing would suggest that the slowdown reflects both supply and demand factors. Credit conditions may have eased somewhat as of late, after the extreme tensions registered following the Lehman default, in terms of both credit standards and spreads on loans. It is, however, premature to conclude that the credit supply cycle has reached a turning point. In order to provide a more accurate assessment of the effect of rescue measures on bank credit, it will be necessary – and this is an avenue for further research – to look into the lending behaviour of individual institutions over a longer time span.

## **The need for an exit strategy**

Overall, it is fair to say that the rescue measures have contributed to an avoidance of “worst case scenarios”, in particular by reducing the default risk of major banks. Before the interventions, financial markets were not providing sufficient long-term funding to banks. On a net basis, capital markets were subtracting resources from banks. The measures implemented since September 2008 have mitigated the effects of this anomaly. Governments have played the role that is usually played by capital markets, supplying long-term resources to banks at reasonable cost, thus contributing to the stabilisation of the financial system. The fact that no major credit event took place after Lehman’s demise is certainly due, at least in part, to the implementation of the rescue measures.

At the same time, government intervention has not been sufficient, at least so far, to trigger a “virtuous circle” for banks, such as a mutually reinforcing increase in capital and borrowing on the one hand and lending and profits on the other. Indeed, between the first and the second quarter of 2009, the portion of overall bank funding provided or guaranteed by governments sharply declined – in the case of bank bond issuance, this portion dropped from 60% to 30% – but this increase in risk appetite may prove transitory and most banks continue to depend on government funds.

The rescue measures have been effective in stabilising the financial system, but this has come at a price, represented by the distortions and inefficiencies mentioned above. This is an example of the trade-off that exists between the stability and the efficiency of the financial system. The existence of these distortions has two important implications.

First of all, the distortions induced by government intervention should be taken into account in the design of the rescue measures. For example, bond guarantee programmes generally

expire at the end of 2009 but it cannot be ruled out that the authorities will decide to extend them into 2010. In such a case, in order to ensure a level playing field across countries, the pricing of the guarantees on bank bonds could be modified in a way that takes into account country-specific factors. For instance, “weaker” countries could be allowed to charge lower fees to their banks, in particular in the euro area, in order to offset those large differences in the cost of issuing bonds which are unrelated to the issuer’s characteristics.

A second implication is that, in order to contain the distortions, governments should dismantle the rescue measures as soon as financial market conditions allow. Even if it may take some time until these conditions materialise, governments should start preparing an exit strategy right now. A credible, quick-to-implement exit strategy is key to avoiding banks and other financial institutions devising their future strategies on the assumption that they will continue to benefit from government support for an extended period of time, possibly at the expense of their competitors.

The condition for dismantling the rescue measures without consequences for banks and for a successful exit strategy is to trigger the above-mentioned virtuous circle, in particular as far as funding is concerned. In this regard, a key ingredient for success is the resumption of the market for securitisation, which has represented a very important source of funding for banks until it dried up because of the financial crisis.

## 1. Government support and developments in bank financing

Since the full violence of the financial crisis erupted in mid-September 2008, following the collapse of Lehman Brothers, governments in virtually all advanced industrial economies have stepped in to provide support to banks and financial institutions, introducing both standalone actions directed at individual distressed institutions and system-wide support programmes (or even multi-programme packages). These measures have included reinforced deposit insurance to help prevent bank runs, capital injections to strengthen banks' capital base, explicit guarantees on liabilities to help banks retain access to wholesale funding, and purchases or guarantees of impaired "legacy" assets to help reduce the exposure of banks to large losses in their asset portfolios. The overall objective of such massive intervention was to avoid widespread bankruptcies of financial intermediaries and to contribute to restoring a normal functioning of financial intermediation.<sup>5</sup>

Government intervention became crucial during the crisis as traditional sources of funding for financial institutions dried up. In particular, financial institutions' issuance of debt securities and equity instruments dropped off considerably in the third and fourth quarters of 2008. Merger and acquisition (M&A) activity in the banking sector, which could have provided a private sector solution to bank restructuring, also remained subdued compared to preceding years. Although large-scale government support may have had side effects – for example, by slowing or even crowding out the revival of non-guaranteed funding and private sector investment in the banking sector – it has no doubt played a crucial role in stabilising banking markets, by meeting funding demands that could not have been fulfilled via the traditional channels during the height of the crisis.

This chapter provides an overview of the government support measures introduced since September 2008 and an account of the changes in the way banks financed themselves during this period. Section 1.1 reviews the timeline of events, identifying several distinct phases with respect to the introduction of government support measures in 11 industrial economies. Section 1.2 highlights the key cross-country patterns in adoption, magnitude and participation rate of such measures and seeks to relate any notable cross-country differences to the design or terms of the different schemes. Finally, Section 1.3 rounds up with a review of the evolution of the sources of bank financing before and after the introduction of government support measures, analysing also to what extent M&As have played a role in facilitating bank restructuring in the crisis.

### 1.1 Government support measures: what has been done since September 2008?

This section takes stock of the measures adopted between September 2008 and 10 June 2009 in 11 countries, which account for the bulk of these interventions: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, the United Kingdom and the United States. The discussion will be limited to central government and central bank actions that target bank balance sheets directly – assets, liabilities and shareholders' equity – and will focus on three main categories of measures: recapitalisations, debt guarantees and asset purchase/insurance (see Appendix for a detailed description of these measures).

1. *Recapitalisations*: Governments shore up banks' Tier 1 or Tier 2 capital by injecting resources in the form of common shares, preferred shares, warrants, subordinated debt, mandatory convertible notes or silent participations. In doing so, they improve banks'

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<sup>5</sup> Other measures, such as central bank liquidity provision, have also helped to stabilise the financial sector. Direct interventions in selected credit markets have contributed to sustaining the flow of credit to firms and households in the light of weakened bank intermediation. These measures, however, are outside the scope of this chapter, but will be mentioned in Chapter 4.

capacity to absorb further losses and strengthen protection for banks' creditors, contributing also to reducing the cost of financing on debt markets. Capital injections, by relieving balance sheet constraints, also seek to sustain banks' capacity to lend. Depending on the terms, recapitalisations could dilute existing shareholders' earning rights and depress stock prices. Recapitalisations via common shares also dilute voting rights.

2. *Debt guarantees*: Governments provide explicit guarantees against default on bank debt and other non-deposit liabilities. These measures help banks maintain access to medium-term funding at reasonable cost, offsetting the drying-up of alternative sources of funding (such as securitisation) and the increase in credit spreads. The intended effect is to reduce liquidity risk and lower overall borrowing costs. The potential adverse effects of this type of measure include segmentation and crowding-out of other credit markets and even distortions in the functioning of bond markets.

3. *Asset purchases or guarantees*: Governments assume part or all of the risk of a portfolio of distressed or illiquid assets. Asset guarantees remove the "tail risk" of insured portfolios from banks' balance sheets. Asset purchases improve bank liquidity, and may even provide capital relief, if purchase prices are higher than book values. The purchase of assets at prices below book value would instead imply a forced writedown for the recipient institution.

### ***A timeline of events***

Table 1.1 reports a timeline for the announcement of both system-wide support programmes and bank-specific standalone actions between September 2008 and 10 June 2009. Events so far can be divided into five distinct phases:

#### *Phase one (September 2008): standalone support actions for large institutions*

The earliest interventions were mostly support for single intermediaries. On 16 September, the day after the Lehman Brothers collapse, the first tranche of aid to AIG was accorded, whereby the US Treasury received a majority equity interest in the insurance firm. By late September, the authorities in Europe – where banks had until then been regarded as less vulnerable – also needed to take action. The Dutch and French governments took part in the recapitalisations of Fortis and Dexia, respectively, in concerted actions with the governments of Belgium and Luxembourg.

#### *Phase two (1–16 October 2008): comprehensive support packages*

As more and more financial institutions became affected by the crisis, it became apparent that ad hoc interventions to support individual institutions would not be sufficient to restore confidence in the system as a whole. Many countries announced comprehensive rescue packages involving some combination of recapitalisations, debt guarantees and asset purchases.<sup>6</sup> Nine out of the 11 countries under review announced a system-wide programme within the first half of October. Although Switzerland did not formally introduce any system-wide programme, the authorities offered help to the country's two biggest banks and eventually intervened in support of UBS.

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<sup>6</sup> Increases in the deposit insurance limit were also widely adopted during this period.

**Table 1.1: Timeline of main government actions: September 2008–June 2009**

Date of announcement	Country/ Institution	Type of action <sup>1</sup>	Type of measure <sup>2</sup>	Currency	Amount (billions) <sup>3</sup>	DESCRIPTION
16 Sep 2008	<b>AIG</b>	SAA	CI	USD	<b>85</b>	Emergency credit line to AIG from the NY Fed, in exchange for which the US Treasury gets a 79.9% equity interest.
29 Sep 2008	<b>Fortis</b>	SAA	CI	EUR	<b>4</b>	The Dutch government purchases 49% of the Dutch activity of Fortis Group (jointly with Belgium and Luxembourg).
30 Sep 2008	<b>Dexia</b>	SAA	CI	EUR	<b>3</b>	The French government recapitalises Dexia, replacing top management positions (jointly with Belgium and Luxembourg).
03 Oct 2008	<b>Fortis</b>	SAA	CI	EUR	<b>13</b>	The Dutch government completes the nationalisation of the Dutch arm of Fortis Group.
	<b>US</b>	PRO	AP	USD	<b>700</b>	Emergency Economic Stabilization Act, containing a commitment for up to \$700 billion to purchase bad assets from banks (TARP).
06 Oct 2008	<b>Hypo Real Estate</b>	SAA	DG	EUR	<b>50</b>	First round of help for HRE.
08 Oct 2008	<b>IT</b>	PRO	CI	EUR	<b>Unspecified</b>	Italy approves a law granting the government the possibility to recapitalise distressed banks.
	<b>GB</b>	PRO	CI	GBP	<b>50</b>	The United Kingdom adopts a comprehensive rescue plan, including CI and DG measures.
PRO		DG	GBP	<b>250</b>		
09 Oct 2008	<b>NL</b>	PRO	CI	EUR	<b>20</b>	The government announces that public funds can be used for bank recapitalisation, of which €20 billion immediately available.
10 Oct 2008	<b>CA</b>	PRO	DG	CAD	<b>Unspecified</b>	The government announces a scheme to guarantee bank liabilities.
12 Oct 2008	<b>AU</b>	PRO	DG	AUD	<b>Unspecified</b>	The government announces a scheme to guarantee bank liabilities.
13 Oct 2008	<b>FR</b>	PRO	CI	EUR	<b>40</b>	Over the weekend, euro area countries agree on a concerted action plan to preserve banking stability; as a follow-up national governments approve schemes including CI, DG and AP.
		PRO	DG	EUR	<b>265</b>	
	<b>DE</b>	PRO	DG	EUR	<b>400</b>	
		PRO	CI&AP	EUR	<b>80</b>	
	<b>IT</b>	PRO	DG	EUR	<b>Unspecified</b>	
	<b>ES</b>	PRO	DG	EUR	<b>100</b>	
PRO		CI	EUR	<b>Unspecified</b>		
14 Oct 2008	<b>NL</b>	PRO	DG	EUR	<b>200</b>	Debt guarantee scheme approved.
	<b>US</b>	PRO	DG	USD	<b>2,250</b>	Debt guarantee scheme approved.
16 Oct 2008	<b>UBS</b>	SAA	AP	USD	<b>54</b>	The Swiss government recapitalises UBS and the SNB sets up a vehicle to remove up to \$60 billion worth of illiquid assets from UBS's balance sheet, on which the bank will bear the first \$6 billion loss.
		SAA	CI	CHF	<b>6</b>	
05 Nov 2008	<b>CH</b>	PRO	DG	CHF	<b>Unspecified</b>	The government announces that it will - if needed - provide a guarantee on bank liabilities.
10 Nov 2008	<b>AIG</b>	SAA	AP	USD	<b>47</b>	Second round of help to AIG, including purchase of illiquid assets and capital injection via preferred shares (partly replacing the \$85 billion credit line).
		SAA	CI	USD	<b>15</b>	
13 Nov 2008	<b>Hypo Real Estate</b>	SAA	DG	EUR	<b>20</b>	The government provides a guarantee on loans to HRE worth €20 billion (partly replacing the first round of measures).
23 Nov 2008	<b>Citigroup</b>	SAA	AG	USD	<b>262</b>	The Treasury subscribes \$20 billion preferred shares and ring-fences troubled assets worth up to \$306 billion (later reduced to \$301 billion - on which Citigroup bears a first loss).
		SAA	CI	USD	<b>20</b>	
28 Nov 2008	<b>IT</b>	PRO	CI	EUR	<b>Unspecified</b>	The government approves a law to inject capital into sound banks.
17 Dec 2008	<b>JP</b>	PRO	CI	JPY	<b>12000</b>	A law is approved increasing the available funds for recapitalisation of banks from JPY 2 trillion to 12 trillion.
16 Jan 2009	<b>Bank of America</b>	SAA	AG	USD	<b>97</b>	The Treasury subscribes \$20 billion of preferred shares and ring-fences troubled assets worth up to \$118 billion (on which BoA bears a first loss).
		SAA	CI	USD	<b>20</b>	
19 Jan 2009	<b>GB</b>	PRO	AG	GBP	<b>Unspecified</b>	A new plan is announced by the government, including the possibility for financial institutions to ring-fence selected portfolios of illiquid assets through a government backstop insurance.
26 Jan 2009	<b>ING</b>	SAA	AG	EUR	<b>28</b>	The Dutch government provides a backup facility to cover the risks of the bank's securitised mortgage portfolio worth €35.1 billion (of which ING bears a 20% loss).
03 Feb 2009	<b>JP</b>	PRO	AP	JPY	<b>1000</b>	Japan reintroduces a previously abandoned programme to purchase stocks from banks' balance sheets will resume.
10 Feb 2009	<b>US</b>	PRO	CI	USD	<b>Unspecified</b>	The Obama administration announces a new plan, including the Capital Assistance Program (stress tests and capital injections) and the Public-Private Investment Program (to remove legacy assets from banks' balance sheets; committed resources have been later quantified in \$75-100 billion).
		PRO	AP	USD	<b>Unspecified</b>	
02 Mar 2009	<b>AIG</b>	SAA	CI	USD	<b>30</b>	Third round of help to AIG: the Treasury commits to a further \$30 billion equity line, converts part of earlier preferred stock investments into instruments more closely resembling equity and restructures parts of AIG activities.
17 Mar 2009	<b>JP</b>	PRO	CI	JPY	<b>1,000</b>	The Bank of Japan announces a framework for providing subordinated loans to banks.
13 May 2009	<b>DE</b>	PRO	AG	EUR	<b>200</b>	Facility for banks to transfer toxic assets to a SPV, in exchange for government-guaranteed bonds.
09 Jun 2009	<b>US</b>	PRO	CI	USD	<b>-68</b>	The US Treasury allows 10 big banks to pay back funds received under the Capital Purchase Program.

<sup>1</sup> SAA = standalone action; PRO = programme. <sup>2</sup> CI = capital injection or emergency loan; DG = debt guarantee; AP = asset purchase; AG = asset guarantee. <sup>3</sup> Indicates the size of government exposure for the various interventions.

Sources: Central bank, government and company websites; press reports.

The announcement of such a large number of comprehensive programmes was in part a result of international coordination, fostered both by the global scale of the crisis and by concerns over potential competitive distortions arising from uncoordinated measures. The G7 meeting on 10 October established guidelines for assistance to systemically relevant institutions; as a follow-up, on 12 October euro area countries adopted an action plan which a few days later was extended to all EU countries and formed the basis for national plans.

*Phase three (November–December 2008): fewer programmes, more standalone actions*

The rollout of new programmes slowed down towards the end of the year, while implementation of existing ones gained pace: as private capital markets suffered heavily from the high uncertainty, government support for capital and debt issuance quickly became crucial to ensure bank financing. In early November, the Swiss authorities announced their readiness to provide guarantees on new bank debt – although no formal framework was set up. Later in the month, the Italian government approved a scheme to inject capital into listed banks. Notably, November saw the emergence of further problems for AIG and Citigroup, prompting further actions from the US authorities: both institutions received a combination of capital injection and asset purchase or guarantee.

*Phase four (January–April 2009): new packages with more emphasis on the assets side*

On 19 January 2009, the UK authorities announced new measures, which included an asset protection scheme, whereby the Treasury provided insurance against large credit losses in one or more defined asset portfolios. Two major banks had joined the scheme by the end-March application deadline. On 10 February, the new US administration outlined the Financial Stability Plan, an articulated framework including a compulsory stress test for the 19 biggest banks, a new capital injection programme (*Capital Assistance Program – CAP*) and a legacy asset purchase programme (*Public-Private Investment Program – PPIP*). Under the Plan, those institutions deemed in need of additional capital – and which could not raise capital from private markets – would obtain support from the CAP. The increased emphasis on legacy assets was reflected in standalone actions, which included an asset guarantee scheme (in combination with another capital injection) for Bank of America (on 16 January) and a backstop facility for a portfolio of mortgages held by ING (26 January).

*Phase five (May–10 June 2009): exiting for some, just getting started for others*

On 7 May, the main US regulators released the results of the stress test, which required 10 institutions to raise a total of \$74.6 billion in capital. In the meantime, in the light of the improved equity market conditions, a number of institutions were able to raise a substantial amount of equity from the market soon afterwards. On 9 June, 10 large banks were also allowed to repay funds previously received under the October scheme (*Capital Purchase Program – CPP*).<sup>7</sup> However, not all CPP recipients were prepared to repay in the near future and, indeed, capital injections continued. In Europe, capital injections through existing programmes or new standalone actions proceeded. At the time of writing, the Spanish government was considering the creation of a fund to facilitate the restructuring and consolidation of regional banks. In Germany, a “bad bank” draft law was passed in mid-May, creating the possibility for banks to swap their impaired assets for government guaranteed bonds.<sup>8</sup> The debt guarantee programmes in several countries were extended and/or expanded.

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<sup>7</sup> A number of smaller recipients had already started repaying from end-March 2009.

<sup>8</sup> The law was expected to gain parliamentary approval in July.

## 1.2 Cross-country snapshot as of June 2009

### Adoption

Table 1.2 provides a snapshot of the measures undertaken by each country with an indication of commitments and outlays. One immediate observation is that actions aimed at addressing capital shortages and funding difficulties (capital injections and debt guarantees) have been widespread: all countries in the sample have taken some measures of either type. Moreover, these types of interventions have mostly taken the form of system-wide programmes and have been implemented in the early phase of government intervention (see previous section). By contrast, measures for removing or guaranteeing banks' assets have been adopted by fewer countries. In addition, in most of these cases the actions addressed problems at big systemic institutions rather than taking a systemic approach and were implemented at a later stage (see Box 1.1). This pattern has in part changed, however, as some recent initiatives in the United States and Germany have included comprehensive schemes for dealing with illiquid or impaired "legacy" assets.

#### Box 1.1: Asset insurance of bank portfolios

The United States, the Netherlands and the United Kingdom have provided asset insurance to a handful of banks (see table). Under these schemes, the government assumes a share of the potential losses on a portfolio of assets, usually after a first loss (or deductible) is absorbed by the bank. In return, the bank pays a fee or insurance premium based on the riskiness of the portfolio. While the bank continues to hold the assets, some or all of the associated "tail risk" is removed from the bank's balance sheet. By limiting the bank's potential losses, asset insurance reduces the regulatory capital it must hold. The government, however, is left with a large potential liability if the assets fall substantially in value. In all five cases, the asset insurance was accompanied by capital injection(s). All five beneficiaries made commitments to increase lending, limit compensation, and restrict dividends or share repurchases.

	<b>Citigroup</b>	<b>Bank of America</b>	<b>ING</b>	<b>RBS</b>	<b>Lloyds Banking Group</b>
Date announced	23 Nov 08	16 Jan 09	26 Jan 09	26 Feb 09	07 Mar 09
Insured portfolio	\$301bn	\$118bn	\$35.1bn	£325bn	£260bn
Portfolio as % of trading assets, investment and loans	23.2%	8.4%	2.3%	14.8%	24.2%
Guarantee fee as % of portfolio	2.4%	3.4%	Not disclosed	4.0–6.0% <sup>1</sup>	6.0%
Bank's first loss as % of portfolio	13.1%	8.5%	None	6.0%	9.6%
Bank's subsequent share in loss	10%	10%	20%	10%	10%
Government's subsequent share in loss	90%	90%	80%	90%	90%
Max downside for government	\$228bn	\$93bn	\$28bn <sup>2</sup>	£269bn	£196bn
Reported increase in Tier 1 capital ratio	1.5%	1.6%	0.4%	Not disclosed	8.1%

<sup>1</sup> Includes £4.6 billion of deferred tax assets. <sup>2</sup> Less any income and fees received.

Sources: Company and government websites; author's calculations.



### Box 1.1: Asset insurance of bank portfolios (cont)

The insured portfolios contain property loans and mortgage-backed securities, although other loans and securities have also been included. The size of the insured portfolio as a percentage of the bank's trading assets, investments and loans varies from 2.3% for ING to 24.2% for Lloyds Banking Group. The average size of the insured portfolios of US and UK banks is 17.6%. The guarantee fee for the US insurance is between 2.4 and 3.4% of the insured portfolio, and is typically paid in preferred shares. The headline guarantee fee paid to the UK government ranges from 2.0% for RBS to 6.0% for Lloyds Banking Group. When the £4.6 billion of tax losses forfeited by RBS are taken into account, its fee is estimated to be between 4.0 and 6.0% of insured assets. The fee for ING has not been disclosed, but is reported to be 17.5% of the insured portfolio value.

Asset insurance is analogous to a put option, sold by the government, on the portfolio with an out-of-the-money strike price. The maximum upside for the government is the upfront fee it receives plus any agreed share of income. The maximum downside is the government's share in the losses less the fee. Given that this fee has been typically paid in preferred shares, the value of the fee is affected by the future performance of the bank. In theory, the value of such a put option would depend on the market value and volatility of the portfolio, the time horizon of the insurance, and the level of interest rates. Given the hard-to-value nature of these portfolios, it is difficult to determine the option's intrinsic value.

This type of insurance raises the question of its cost to taxpayers and its effectiveness in supporting financial institutions. By providing insurance to selected banks, governments signal both the extent of the problems on the banks' balance sheets and the systemic importance of the beneficiaries. On the positive side, asset insurance provides capital relief by reducing a bank's risk-weighted assets, although the effect is hard to disentangle from the capital injections that accompanied them. Based on company reports, these schemes increased the Tier 1 capital ratios by 0.4% for ING, 1.5% for Citigroup, 1.6% for BoA and 8.1% for Lloyds Banking Group. However, since the insurance covers only part of the bank's risky assets it does not eliminate uncertainty over future losses and cannot guarantee the restoration of investor confidence.

Asset insurance has the advantage of not requiring any upfront outlay of public funds and may therefore be less politically difficult to implement. At the same time, the government's contingent liability may be very large: compare, for instance, the potential maximum downside of the Citigroup scheme, at \$228 billion, with the size of the US Capital Purchase Program, at \$250 billion.

The risk-return trade-off in the US and UK cases appears to favour the banks, as the government has assumed much of the downside (beyond the first loss), with limited or no share in the upside should the portfolio values prove higher. Only in the Dutch case does the state share in the upside directly.

### **Magnitudes**

In Table 1.2, the outlay figures provide an indication of the magnitude of the actions undertaken so far.<sup>9</sup> Thus, the UK and the US interventions have been the largest relative to the size of the national banking sector (see Figure 1.1, left-hand panel). If outlays are scaled by the size of GDP, then the Netherlands appears to have taken massive action, while the United States appears to have done less.

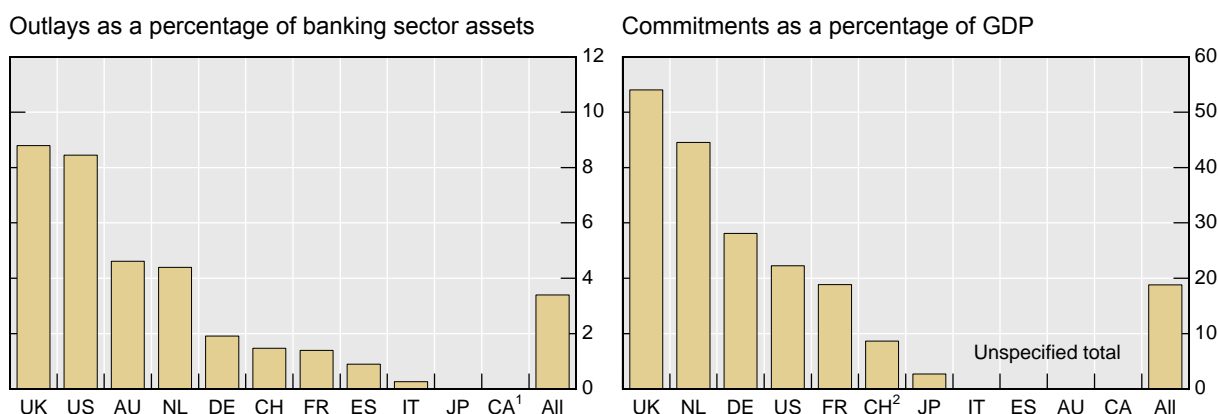
The commitment figures provide an indication of the overall exposure of governments vis-à-vis the financial sector (Figure 1.1, right-hand panel).<sup>10</sup> The United Kingdom and the Netherlands stand out in terms of exposure, with overall commitments hovering around 50%

<sup>9</sup> Outlays in the case of capital injections or asset purchases refer to the actual amount injected or purchased. In the case of debt and asset guarantee, outlays are defined as the government's exposure given the actions actually taken.

<sup>10</sup> Commitments include the announced size of programmes as well as actual outlays under standalone actions.

of GDP, a figure that might raise concerns about the long-term sustainability of those commitments.<sup>11</sup> The high ratios are only partly a reflection of the relatively larger size of the banking sector in those two countries: even when scaled by total bank assets, commitments are still bigger than for all other countries except the United States.<sup>12</sup>

Figure 1.1  
**Snapshot of rescue packages**  
 In per cent



<sup>1</sup> No outlays so far. <sup>2</sup> Excludes the unspecified verbal commitment of possible debt guarantee.

Source: Table 1.2

Further insights into the provision of assistance to the financial system can be gained from bank-level information. Table 1.3 shows the participation figures for 85 financial institutions that have obtained government assistance. Around half of the sample (44) has received capital injections while three quarters (64) has issued guaranteed bonds; only 8 institutions have benefited from asset purchase or guarantees. Half of the banks that have received capital (22) have also issued guaranteed bonds, while all the banks participating in asset purchase/guarantees have also received at least one capital injection.

Among banks that have received capital injections, the average amount of capital injected was close to 30% of the book value of shareholder equity. Among banks that have issued bonds under government guarantee, the average amount of bonds issued was small when compared with total liabilities, at 4.3%. Average intervention via asset purchase or guarantee amounted to 11.1% of total assets.

<sup>11</sup> It is worth noting that, for the United Kingdom, around three quarters of overall commitment comes from the asset protection schemes for RBS and Lloyds Banking Group, for which the government's potential exposure measures more than £400 billion. Excluding such exposure, commitments would fall to around 10% of GDP.

<sup>12</sup> The US banking sector is small relative to the size of the US economy.

Table 1.2: Overview of commitments and outlays<sup>1</sup>

Euro billions and percentage points	Capital injections			Debt guarantees (1)			Asset purchase			Asset guarantees (1)			Total			
		% of GDP (2008)	% of banking sector assets (end 2008)		% of GDP (2008)	% of banking sector assets (end 2008)		% of GDP (2008)	% of banking sector assets (end 2008)		% of GDP (2008)	% of banking sector assets (end 2008)	Euro billions	% of GDP	% of banking sector assets (end 2008)	
<b>Australia</b>																
Commitments	-	-	-	UNS	UNS	UNS	-	-	-	-	-	-	UNS	UNS	UNS	
Outlays	-	-	-	62	10.4	4.6	-	-	-	-	-	-	62	10.4	4.6	
<b>Canada</b>																
Commitments	-	-	-	UNS	UNS	UNS	-	-	-	-	-	-	UNS	UNS	UNS	
Outlays	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-	
<b>France</b>																
Commitments	43	2.2	0.6	320	16.4	4.2	-	-	-	5	0.2	0.1	368	18.9	4.8	
Outlays	28	1.4	0.4	72	3.7	0.9	-	-	-	5	0.2	0.1	104	5.3	1.4	
<b>Germany (2)</b>																
Commitments	80	3.2	1.0	420	16.9	5.3	UNS	UNS	UNS	200	8.0	2.5	700	28.1	8.9	
Outlays	22	0.9	0.3	129	5.2	1.6	0	0	0	0	0	0	151	6.1	1.9	
<b>Italy (3)</b>																
Commitments	20	1.3	0.5	UNS	UNS	UNS	-	-	-	-	-	-	UNS	UNS	UNS	
Outlays	10	0.6	0.3	0	0	0	-	-	-	-	-	-	10	0.6	0.3	
<b>Japan</b>																
Commitments	105	2.5	0.9	-	-	-	8	0.2	0.1	-	-	-	113	2.7	0.9	
Outlays	3	0.1	0.0	-	-	-	0	0.0	0.0	-	-	-	3	0.1	0.0	
<b>Netherlands</b>																
Commitments	37	6.2	1.7	200	33.6	9.0	-	-	-	28	4.7	1.3	265	44.6	11.9	
Outlays	31	5.1	1.4	40	6.8	1.8	-	-	-	28	4.7	1.3	99	16.6	4.4	
<b>Spain</b>																
Commitments	UNS	UNS	UNS	100	9.1	3.0	-	-	-	-	-	-	UNS	UNS	UNS	
Outlays	0	0	0	31	2.8	0.9	-	-	-	-	-	-	31	2.8	0.9	
<b>Switzerland</b>																
Commitments	4	1.1	0.2	UNS	UNS	UNS	27	7.6	1.3	-	-	-	UNS	UNS	UNS	
Outlays	4	1.1	0.2	0	0	0	27	7.6	1.3	-	-	-	31	8.7	1.5	
<b>United Kingdom</b>																
Commitments	54	3.4	0.7	269	17.2	3.4	-	-	-	523	33.4	6.7	845	54.0	10.8	
Outlays	54	3.4	0.7	113	7.2	1.4	-	-	-	523	33.4	6.7	690	44.1	8.8	
<b>United States (4)</b>																
Commitments	335	3.0	3.4	1,760	15.7	18.0	115	1.0	1.2	281	2.5	2.9	2,491	22.3	25.5	
Outlays	237	2.1	2.4	271	2.4	2.8	36	0.3	0.4	281	2.5	2.9	825	7.4	8.4	
<b>Total commitments (5)</b>	<b>677</b>	<b>2.6</b>	<b>1.1</b>	<b>3,131</b>	<b>11.8</b>	<b>5.2</b>	<b>150</b>	<b>0.6</b>	<b>0.3</b>	<b>1,036</b>	<b>3.9</b>	<b>1.7</b>	<b>4,994</b>	<b>18.8</b>	<b>8.3</b>	
<b>Total outlays</b>	<b>387</b>	<b>1.5</b>	<b>0.6</b>	<b>719</b>	<b>2.7</b>	<b>1.2</b>	<b>64</b>	<b>0.2</b>	<b>0.1</b>	<b>836</b>	<b>3.2</b>	<b>1.4</b>	<b>2,006</b>	<b>7.6</b>	<b>3.3</b>	

<sup>1</sup> As of 10 June 2009 unless otherwise specified. UNS = unspecified amount; "-" = no programme/action. Banking sector assets are consolidated data of: for Australia, banks, credit unions, building societies and corporations; for Canada, chartered banks; for Japan, depository corporations (banks and collectively managed trusts); for Switzerland, all domestic banks; for the five euro area countries and the United Kingdom, monetary financial institutions; and for the United States, commercial banks. (1) Outlays indicate the value of liabilities/assets actually under government guarantee. Debt guarantee outlays comprise only bonds publicly issued up to 29 May, except for: Australia, where they indicate average daily outstanding amounts of both deposits and wholesale funding in May 2009; and for the United States, where they include all outstanding FDIC-guaranteed liabilities as of 31 May. (2) Part of the €80 billion set aside for recapitalisation can be used also for asset purchase. (3) The commitment for capital injection indicates the upper bound of the global budget for the measure as approved by the European Commission; outlays include the intended (publicly announced) requests for funds not yet finalised. (4) Figures exclude the capital injections to Freddie Mac and Fannie Mae and the \$700 billion TARP commitment to buy illiquid assets (later modified for other purposes); capital injection outlays are net of funds already repaid by the time of writing. (5) Unspecified commitments are proxied by actual outlays.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

Table 1.3

**Government intervention: bank-level data<sup>1</sup>**

	Capital injected <sup>2</sup> / book value of shareholder equity			Guaranteed bonds issued / book value of liabilities			Assets purchased or guaranteed / book value of total assets		
	CI	DG	AP	CI	DG	AP	CI	DG	AP
Average (%)	29.0	29.1	58.1	2.5	4.3	3.7	11.1	13.6	11.1
Std. deviation (%)	33.0	18.2	61.7	2.0	7.9	2.8	15.8	17.8	15.8
Total amount (€ bn)	387	228	231	291	562	185	899	835	899
No of banks	44	22	8	22	64	6	8	6	8

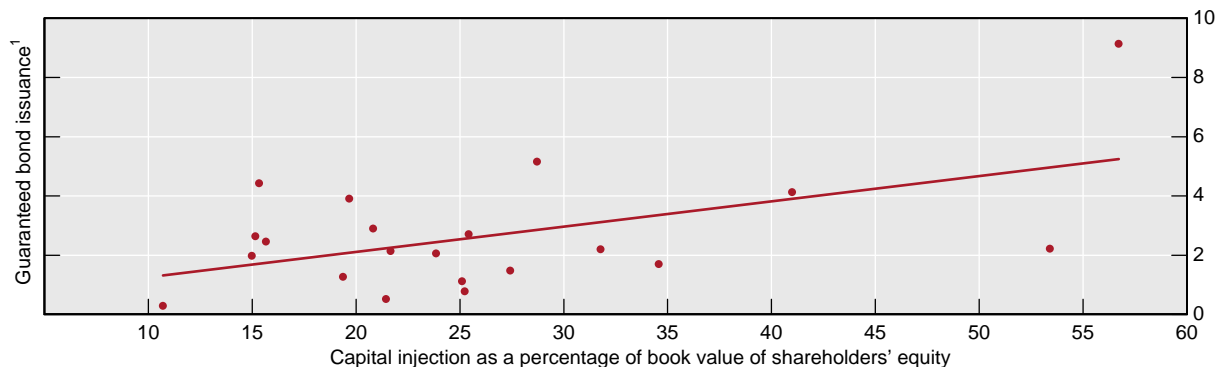
CI = banks that have received capital injections; DG = banks that have issued guaranteed bonds; AP = banks that have participated in asset purchases or guarantees.

<sup>1</sup> Based on a sample of 85 financial institutions that have obtained government assistance; bank balance sheet data as of end-2008. <sup>2</sup> Figures for capital injections do not take repayments into account.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

It is of note that among those banks that have participated in asset purchase/guarantee, the average size of capital injection is much higher, at almost 60% of shareholder equity; moreover, as mentioned earlier, participation in asset purchase/guarantee usually occurred after earlier capital injections. This suggests that measures addressing illiquid asset portfolios were used only after a first phase of government support failed to fully restore confidence in troubled institutions.

Figure 1.2

**Capital injections and guaranteed bond issuance**

Note: Based on a subsample of 21 financial institutions that have participated in both capital injections and debt guarantees. Figures for capital injections do not take into account funds already repaid.

<sup>1</sup> As a percentage of book value of liabilities.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

Finally, the banks that have received bigger capital injections also tend to be the ones that have borrowed more under government guarantees. Figure 1.2 shows a positive correlation between the uptake size of government support under the two types of interventions.

## Participation in programmes

The uptake rate for eligible institutions is often mentioned as a possible measure of “effectiveness” of government rescue plans. In practice, however, this indicator is probably imperfect in many respects.

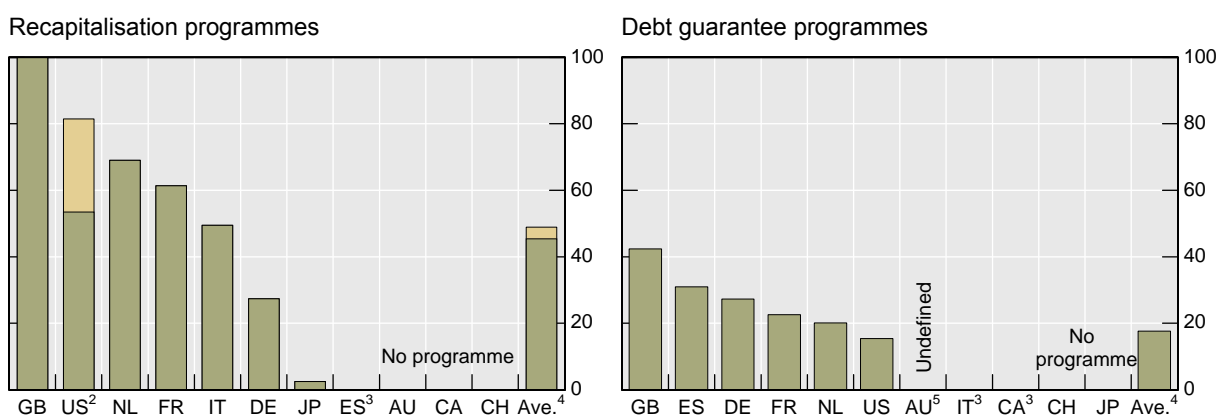
The participation rate would be artificially high if the conditions of the programme (both price conditions and non-price conditions, such as limits to dividend distribution or caps on managers’ remuneration) were too favourable or if the programme were custom-designed to suit the needs of the intended beneficiary banks. Moreover, the participation rate could be higher in one country, irrespective of the characteristics of the programme, simply because domestic banks need government support more than banks in other countries. Yet another factor potentially affecting participation rates is the existence of stigma effects associated with participation. What also makes cross-country comparisons at any one point in time difficult is the fact that not all programmes have been in place for the same length of time: newer programmes are likely to show lower participation compared with programmes that have been in operation for a while. Finally, participation in debt guarantees might be partly driven by the maturity structure of liabilities. Unless these factors are taken into account, the uptake rate may not be a conclusive indicator of participation.

In spite of these weaknesses, such an indicator is nonetheless interesting in that it provides a sense of how uptake varies across measures and across countries. Figure 1.3 shows the participation rate for the recapitalisation and debt guarantee schemes in the sample, defined as the share of outlays in total commitments.<sup>13</sup>

Figure 1.3

### Programme participation rate<sup>1</sup>

In per cent



<sup>1</sup> Outlays under a programme as a percentage of the commitments of the programme. <sup>2</sup> The top part of the bar denotes the amount that has since been repaid to the government. <sup>3</sup> No participation so far. <sup>4</sup> Simple average of countries with programme and defined participation. The top part of the bar in the left-hand panel denotes the amount that has since been repaid by US banks to the government. <sup>5</sup> There is participation, but total commitment is not specified.

Sources: Bloomberg; company and government/central bank websites; press reports; authors’ calculations.

<sup>13</sup> For programmes with an unspecified maximum committed amount – if no outlays have taken place, the participation rate is defined as being equal to zero (eg recapitalisation programme in Spain; debt guarantee programmes in Canada and Italy). For programmes that do not have a maximum limit but for which outlays have taken place, the participation rate is not well defined (eg debt guarantee scheme in Australia).

The average uptake on capital injections (49%) is higher than that for debt guarantees (18%). A small number of fully developed programmes have seen zero participation so far (eg debt guarantee in Canada and Italy). This probably reflects the fact that financial intermediaries in those countries are in good enough shape to not need assistance.<sup>14</sup>

The United Kingdom is the country with the highest participation rates for both capital injections and debt guarantees. This possibly reflects the tailor-made nature of the programmes, the design of which involved the participation of the nation's major financial institutions. The high participation rate in the US recapitalisation programme,<sup>15</sup> around 80% (gross of the \$70 billion already paid back by a number of institutions), could instead reflect the favourable price terms at which the government offered public injections.

For debt guarantees, the flat fee scheme implemented in the United States – more favourable, in principle, for riskier banks than the European schemes, where fees vary with banks' riskiness – was not sufficient to induce a higher participation rate: indeed the US uptake ratio (15% as of end-May 2009) is lower than the average one for the European countries included in the sample (24%).

Finally, the participation rate, so defined here, might also be interpreted as an indicator of the residual room for government to provide support to banks within the approved frameworks. In this sense, countries with an already high participation rate have less room for manoeuvre in case there is need to provide yet more help to some financial institutions. These countries may face the risk of having to find additional resources, which might put additional stress on public finances and encounter political opposition.

### **1.3 Bank financing before and after the introduction of government support**

As mentioned in the introduction to this chapter, government intervention became crucial during the crisis as traditional sources of funding for financial institutions shrank significantly. The sharp deterioration in market conditions and investor confidence after the collapse of Lehman Brothers in September 2008 made it extremely difficult for banks to continue financing their activities through debt and equity markets; at the same time, M&As in the banking sector, which could have provided a private sector solution to bank restructuring, remained subdued compared to preceding years. This section reviews how banks' sources of financing evolved before and after the introduction of government support measures. In particular, it examines trends in quarterly public issuance of bonds, convertible securities, preferred shares and common equity in domestic and global capital markets over the past two years.<sup>16</sup> The role of M&As in facilitating bank restructuring in the crisis is instead the focus of Box 1.2.

#### ***Bank financing through public capital markets***

Prior to the crisis, US and European banks relied extensively on public debt markets to raise longer-term capital (Figure 1.4). Debt issuance made up the majority of public market financing in 2007 and 2008. Common share issuance was a distant second choice, with little issuance of preferred shares or convertible securities. Following the Lehman bankruptcy,

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<sup>14</sup> Alternative – non-exclusive – explanations could be stigma effects or that the terms of the programmes are unattractive even for institutions that may be in need.

<sup>15</sup> This refers to the Capital Purchase Program only.

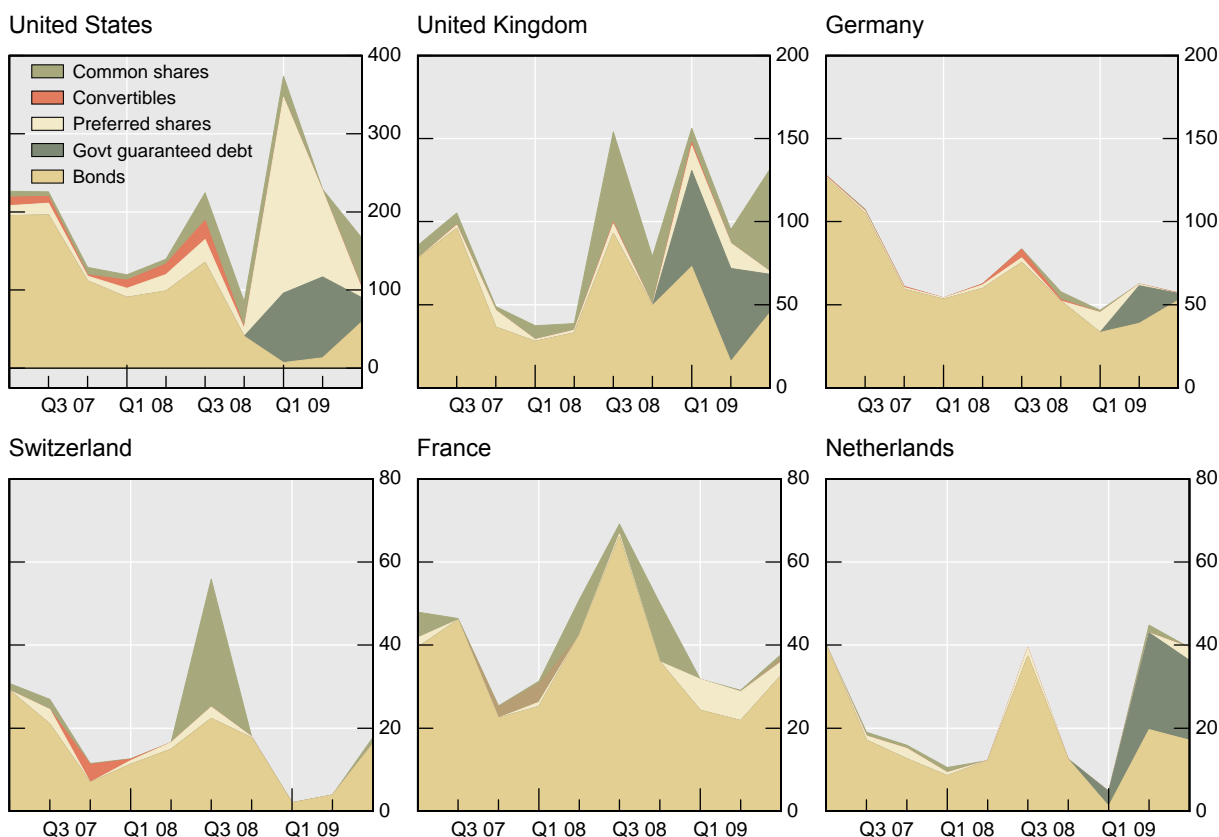
<sup>16</sup> Data are based on public market issuance by private-sector banks and finance companies, as reported by Dealogic. The analysis does not consider internal sources of financing, deposits or money market activity, which are key funding sources for banks.

global bond issuance fell by half from a peak in the second quarter of 2008 to the third quarter, falling further in the fourth. Secondary market trading activity also came to a standstill, with credit spreads on senior and unsecured bank debt widening dramatically. With interbank and money markets virtually closed, banks that relied on wholesale markets for funding found themselves with no means to finance their increasingly illiquid portfolios.

Figure 1.4

**Capital market financing for private banks and finance companies<sup>1</sup>**

In billions of US dollars



<sup>1</sup> Includes covered bonds but excludes issuance of asset-backed securities (ABS) and mortgage-backed securities (MBS). Figures are based on Dealogic data and may differ in coverage from data used elsewhere in this report.

Source: Dealogic.

In this environment, issuance of government-guaranteed debt ballooned relative to non-guaranteed bond issuance (banks' issues of guaranteed bonds are examined in detail in Chapter 3). US and UK banks were the largest issuers in the first quarter of 2009. Although Australian banks were relatively unaffected by the crisis, they took advantage of this cheap form of capital and issued significant amounts of guaranteed debt in the first quarter of the year. German and Spanish banks were also active issuers.

Government capital injections represented a second major source of bank capital raising over this period. Most governments bought hybrid securities – such as preferred shares, subordinated debt or mandatory convertible notes – with only the UK government purchasing common shares in its banks. The US capital injections under the Capital Purchase Program were by far the largest, and show up as a large spike in preferred share issuance in the fourth quarter of 2008 and first quarter of 2009 (Figure 1.4). Over this six-month period, the US Treasury invested \$240 billion in US banks, representing a significant portion of the

capital raised by those institutions. Other countries investing significant amounts of capital were the United Kingdom, the Netherlands, France and Germany.

The negative trend in capital markets somewhat reversed in the second quarter of 2009, reflecting growing confidence that the worst of the crisis had passed. Issuance volumes of non-guaranteed debt rose, as these markets recovered. Over the same period, government-guaranteed issuance fell from its peak in the previous quarter. Overall, in the second quarter the share of non-government-guaranteed bonds and common stock in global capital raising rose while the share of government-guaranteed debt and preferred issuance declined.

In the United States, the increased private appetite for risk followed the release in early May of the results of the US government's stress tests for the 19 largest bank holding companies. US regulators directed 10 of the banks examined to increase their level of capital or to improve the quality by including more common shares. A number of banks took advantage of the reduced uncertainty and the increased risk appetite of investors to raise common equity and issue debt. The pattern in the United Kingdom was similar, with a rise in issuance of common stock and non-guaranteed bonds. Japanese financial institutions issued large amounts of common equity, while French, German, Italian and Swiss banks relied mostly on non-guaranteed debt issuance. In Australia, activity in the second quarter of 2009 was lower than in the previous quarter, driven by a fall in issuance of government-guaranteed debt.

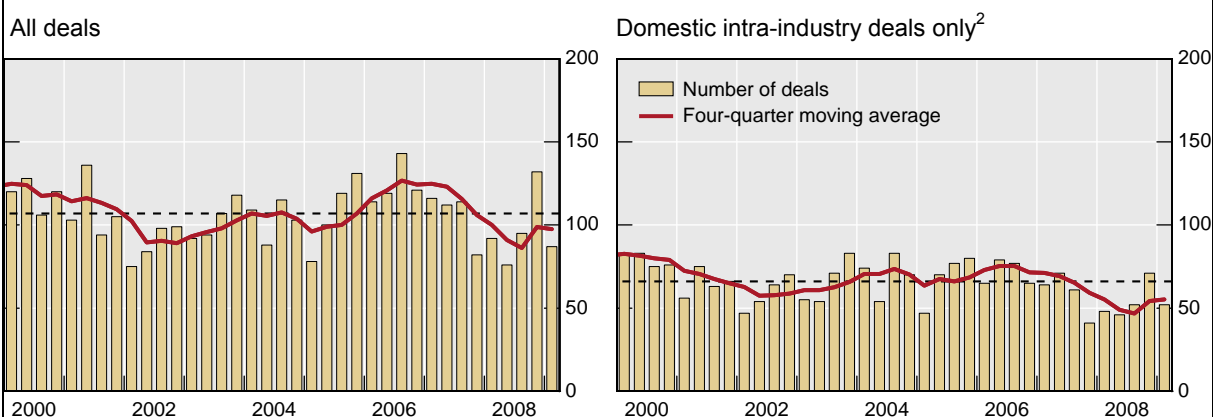


### Box 1.2: Bank mergers and acquisitions – an alternative solution?

In the midst of the crisis, merger and acquisition (M&A) activity could have represented a private sector solution to strengthen weaker banks, via consolidation with stronger ones. However, during the period under review, the scope of the operations concerned was substantially reduced, suggesting that this type of solution was not very actively applied.

M&A activity in the banking sector had been buoyant until the third quarter of 2007, but began to contract with the onset of the financial market turmoil in late 2007, well before the outbreak of the full-blown crisis in 2008. The number of bank M&A deals worldwide (ie where the target company is a bank) dropped from an average of 121 per quarter in the two years to Q3 2007 to about 90 in the subsequent quarters, even if the spike in Q4 2008 is taken into account (graph, left-hand panel). Notwithstanding some high-profile deals during this turbulent period,<sup>①</sup> the number of M&As in 2008 and Q1 2009 was low by the standards of the last decade, matched only by that in 2002 in a period characterised by weak economic conditions and corporate scandals. There was also a considerable decline in the number of deals involving investment companies, which include investment banks.

#### M&A deals in the banking sector<sup>1</sup>



The horizontal dashed line indicates the simple average for Q1 2000–Q4 2008.

<sup>1</sup> M&As involving majority interests, where the target company is a bank; the banking sector includes commercial banks, bank holding companies, savings and loans, mutual savings banks and credit institutions. Data for Q1 2009 are provisional. <sup>2</sup> Both the target company and the acquirer are banks of the same country.

Source: Based on Thomson Reuters SDC Platinum data.

Past experience shows that the deals aimed at restructuring weak banks are generally realised through domestic intra-industry deals,<sup>②</sup> where banks are taken over by other banks of the same country. This option tends to be both operationally and politically more viable. Even though deals in this category have continued to represent the majority of the bank M&A deals worldwide, their number has also decreased since late 2007 (graph, right-hand panel). In fact, domestic intra-industry M&A activity in 2008 and Q1 2009 was at its lowest level in at least 15 years.

A number of factors may have hampered the appetite for M&As in general or the use thereof as a solution for rescuing weak banks in particular. First, the crisis has most severely affected large intermediaries, which would be expensive as targets for potential bidders. In turn, large financial intermediaries are themselves not in a strong position to acquire smaller competitors – the trend has in fact been divestment rather than further acquisitions. Second, even if there have been willing bidders, the illiquidity of international stock and bond markets has made it extremely difficult, including for very large intermediaries, to raise the resources necessary to finance the deals. Third, M&As, in particular those involving large banks operating in retail markets, may have given rise to concerns about the potential anti-competitive effects of the transactions. M&As may also have been limited by political resistance to the surrender of control of large domestic banks to foreign investors, as epitomised by the debate on the role of sovereign funds as suppliers of capital.

<sup>①</sup> For example, Bank of America acquiring Countrywide Financial and Merrill Lynch, Wells Fargo acquiring Wachovia, Lloyds TSB acquiring HBOS, and BNP Paribas acquiring 75% of Fortis Bank from the Belgian state. <sup>②</sup> See Hawkins and Turner (1999); Group of Ten (2001); and Ferguson et al (2007), Chapter 8.

## Appendix: Details of government support measures

As discussed in Section 1.2, recapitalisation and debt guarantee programmes have been widely adopted since the outbreak of the financial crisis in September 2008; at a later stage, some countries also adopted actions targeting banks' portfolios of legacy assets. This appendix reviews the main features of government measures between September 2008 and 10 June 2009 in 11 countries, which account for the bulk of these interventions: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, the United Kingdom and the United States. Table A1 provides a summary of the different types of measures covered in the analysis.

**Table A1: Overview of government support measures**

As of early June 2009

	Recapitalisation		Debt guarantee		Asset purchase		Asset guarantee	
	PRO	SAA	PRO	SAA	PRO	SAA	PRO	SAA
Australia			●					
Canada			○					
France	●	◐	●	◐				◐
Germany	●		●	●	○		○	
Italy	○●		○					
Japan	●●				●			
Netherlands	●	◐	●					●
Spain	○		●					
Switzerland		●	○ <sup>1</sup>			●		
United Kingdom	●		●				●	
United States	●○	●●●	●		○	●		●●

PRO = programme; SAA = standalone action; ● = measures announced and in use; ○ = measures announced but not yet in use; ◐ = concerted action with other government(s).

<sup>1</sup> Verbal commitment only, no formal programme adopted.

### Recapitalisation programmes

Table A2 provides an overview of the main features of capital injection schemes. Eight of the 11 economies in the sample have adopted programmes, though not all of them have been in use (eg the first Italian programme aimed at distressed banks or the Spanish programme). As of June 2009, the second US programme (Capital Assistance Program – CAP) had yet to inject any capital, though a preliminary stress test phase has been completed; those banks deemed in need of additional capital that will not be able to raise it from private sources will obtain support under this scheme.

Funds are typically **administered** by the Ministry of the Economy/Finance. In Japan, the Financial Services Agency and the Bank of Japan are each responsible for one programme. In Germany and France, instead, funds are issued via two new entities: the Sonderfonds Finanzmarktstabilisierung (SoFFin) and the Société de Prise de Participation de l'Etat (SPPE).

The **maximum size** of programmes is typically well defined. The notable exceptions are Italy and Spain, where there is no explicit maximum amount – though the authorities made it clear that resources would be provided “as needed”. The US CAP does not have a specified size in part because the amount to be provided will depend on how much capital banks have been able to raise on their own after the stress test. There are a few programmes where a **per-institution limit** applies. For example, for the second Italian programme and the first US programme (Capital Purchase Program – CPP), the limit is a fraction of the bank’s risk-weighted assets. In Germany, the cap is described as “in general” €10 billion.

The **eligible institutions** are mainly banks and credit institutions, though some programmes also admit insurance companies (eg in France, Germany and the Netherlands) and other financial institutions such as pension funds (in Germany). A number of programmes allow access by subsidiaries of foreign banks as well.

A wide range of **instruments** is represented; however, most capital injections tend to take non-dilutive forms such as preferred shares, non-voting securities, mandatory convertible instruments or subordinated debt securities. The purchase of common shares is dominant only in the UK programme, though it is also used in selected actions under other programmes (eg the second injection into Commerzbank) as well as in standalone actions (see below). But there are options for converting/exchanging instruments with less loss-absorption capacity to/for common shares (or instruments closer to common shares).<sup>17</sup>

The **pricing** of instruments can be quite complicated and differs considerably across countries. The ECB has established guidelines for programmes in Europe: the annual cost of hybrid capital instruments must reflect market considerations and must be between 6 and 9.3%, according to the degree of subordination. Nonetheless, individual countries have room to put in place complex pricing structures that provide incentives that (i) favour early repayment, so as to reduce taxpayers’ exposure, and (ii) avoid excessive recourse to the programme, but without being excessively penalising.<sup>18</sup> In the UK scheme, ordinary shares have been issued at a discount to the reference market price, while preferred shares pay a rather hefty 12% annual dividend for the first five years and three-month Libor plus 700 basis points thereafter. By contrast, the cost of preferred shares under the US CPP is a relatively generous 5% for the first five years and a flat 9% thereafter. Pricing is dearer under the CAP, where the mandatory convertible instrument carries a 9% annual dividend.

A number of non-price **conditions** also apply, with restrictions on executive compensation and dividend payments among the most widely adopted. Requirements to maintain adequate lending to businesses and/or households are also widespread. Some schemes give the government the right to appoint board members or to oversee corporate governance of the recipient. Finally, capital injection could also be made conditional on the adoption of an appropriate business strategy or restructuring plan (eg Germany, the first Italian scheme).

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<sup>17</sup> In the French programme, for example, banks were given the option to replace the subordinated debt issued in the first round of capital injection with preferred shares in the second round. In the UK programme, the small amount of preferred shares issued in the first round of injection were later replaced with ordinary shares.

<sup>18</sup> In the French scheme, for example, the dividends of preferred shares are the higher of the cost of subordinated debt plus 25 basis points and distributed profits augmented by a factor (105% in 2010, 125% in 2018), with a cap at twice the cost of subordinated debt. In the Dutch case, the non-voting shares issued so far pay nothing if no dividends were paid in the previous year, 8.5% per year if dividends of up to 8.5% were distributed, or else amounts equal dividends augmented by a coefficient (110% in the first year, 120% second year, 125% thereafter). In the second Italian scheme, the cost of the undated convertible subordinated debt is the highest of three options: (i) a flat rate starting at 8.5% and increasing over time; (ii) distributed dividends augmented by a coefficient, starting at 105% and increasing over time; or (iii) starting in 2011–12, 30-year Treasury bond yield plus 300 basis points – and from 2013, 30-year Treasury bond yield plus 350 basis points.

Finally, a number of programmes have **redemption and conversion** options. In Italy and the Netherlands, preferred shares can be converted to ordinary shares after three years, while buybacks are allowed but at a premium over the issue price. In the United States, preferred shares under the CPP can be redeemed by the banks after three years, at the issue price augmented by accrued and unpaid dividends. Early redemption is allowed only with the proceeds from the sale of Tier 1 qualifying perpetual preferred stocks or common stocks.

### **Recapitalisation: standalone actions**

Four countries in the sample have undertaken capital injections outside system-wide programmes to support financial institutions that were under more severe strains. In Switzerland, **UBS** received a CHF 6 billion injection in the context of a legacy asset purchase operation (see below). The injection took the form of mandatory convertible notes with a 12.5% coupon. The notes would convert into common shares after 30 months, giving the government an approximate 9% stake in the bank. The recipient was subject to limits to compensation policies and on-site inspections by the central bank.

France participated in a concerted intervention with Belgium and Luxembourg to support **Dexia**. The French state and the state-controlled financial services company Caisse des Dépôts et Consignations subscribed to €3 billion out of the total €6.4 billion equity capital injection. The chairman and the CEO of the recipient were replaced by two government nominees.

The Netherlands intervened, also with Belgium and Luxembourg, in **Fortis**, a Benelux insurance-banking group. The first concerted intervention in late September 2008 sought to take a 49% stake in the respective national activities of the banking arm of the group via an injection of €11.2 billion in common equity (of which €4 billion came from the Netherlands). While Belgium's and Luxembourg's announced injection went ahead, the Dutch state later replaced the capital injection with the outright purchase of all of Fortis's Dutch operations (both banking and insurance) for €16.8 billion. The Belgian state also subsequently bought the remaining stake in the Belgian banking operation (Fortis Bank) from the group.<sup>19</sup>

In the United States, standalone actions have been taken in favour of **AIG**, Citigroup and Bank of America.<sup>20</sup> **AIG** has seen three rounds of interventions. On 16 September 2008, the day after the Lehman bankruptcy, the company was granted an \$85 billion 24-month credit facility from the Federal Reserve Bank of New York. In return, the US government received a 79.9% equity interest with the right to veto the payment of dividends to shareholders. The second intervention in November 2008 included a \$40 billion investment by the Treasury in new preferred shares<sup>21</sup> and two asset purchases (see below). In return, the original credit facility was reduced to \$60 billion, but with more favourable terms.<sup>22</sup> In the third intervention in March 2009, the \$40 billion preferred shares issued in November were converted to new preferred shares that more closely resemble common shares, a new equity capital facility of up to \$30 billion was introduced, and the amounts owed to the credit facility were reduced, in exchange for government stakes in two AIG-related special purpose vehicles (SPVs).

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<sup>19</sup> After this purchase, the Fortis group was left with only insurance operations. The Belgian state later transferred 75% of Fortis Bank to BNP Paribas.

<sup>20</sup> In addition to the government-sponsored agencies Fannie Mae and Freddie Mac in early September 2008.

<sup>21</sup> The so-called Systemically Significant Failing Institutions category under TARP.

<sup>22</sup> Interest on the credit drawn was reduced from a punitive three-month Libor plus 850 basis points to three-month Libor plus 300 basis points. The fee on the undrawn portion of the facility was reduced from 850 to 75 basis points. The term of the facility was extended from two years to five years.

After receiving \$25 billion each under the CPP, both **Citigroup** and **Bank of America** received another \$20 billion capital injection in November 2008 and January 2009, respectively.<sup>23</sup> These injections involved Treasury subscriptions of preferred shares with a fixed coupon of 8% (higher than that for CPP shares in the first five years), a prohibition of dividend payments for three years and limits on executive compensation. The two additional injections were announced in the context of multi-element packages that included asset guarantee plans for the two banks (see below).

### Debt guarantee programmes

Table A3 provides an overview of debt guarantee schemes announced since September 2008. Of the 11 countries in the sample, only Japan and Switzerland have not formally adopted any new debt guarantee scheme, though the Swiss authorities did make a verbal commitment to provide guarantees in case of need. France and Germany have both programmes and standalone actions.

The **size** of programmes is usually predetermined, except for those in Australia, Canada and Italy. Most schemes impose a **per-institution limit** on how much each participant can issue under guarantee. The limit tends to be based on either the outstanding amount of debt set to mature by a certain date or some measure of the participating institution's liabilities; in the Canadian and US schemes, the limit is set at 125% of the maturing debt. Other conditions such as minimum issue size may apply (eg in Canada and Spain).

All schemes include domestic banks as **eligible institutions**. Most schemes potentially also cover subsidiaries of foreign banks.<sup>24</sup> Some also cover institutions such as building societies, thrifts and credit unions. The German programme is the only one that explicitly covers insurance companies, pension funds and other financial entities as well.<sup>25</sup> The French scheme is a special case in that guarantees are not extended directly to financial institutions but to a new, partly government-owned entity (Société de Financement de l'Economie Française – SFEF). The funds raised by SFEF are then lent against eligible collateral to French credit institutions and subsidiaries of foreign credit institutions.

As for **eligible instruments**, the focus is on newly issued senior unsecured debt. Some schemes explicitly require that the instrument be non-complex (eg in Australia, Canada, the Netherlands and the United Kingdom) or marketable (eg in Canada and Spain). A number of schemes also cover shorter-term instruments such as certificates of deposit and commercial paper. Interbank borrowings are covered in some cases (eg in Australia, Germany and the United States). Over time, a few countries have extended guarantees to other instruments such as asset-backed securities (the United Kingdom) and mandatory convertible bonds (the United States). In terms of **maturity**, the focus is on medium-term instruments, with some schemes explicitly excluding very short-term liabilities. The maximum maturity, if stated, is typically either three or five years.<sup>26</sup> With regard to **currency denomination**, most programmes allow issuance in foreign currencies at least to some extent.

Most EU countries have adopted similar market-determined **fees** consisting of a fixed base fee (typically 50 basis points per annum) plus, for issues over one year, an add-on that

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<sup>23</sup> The so-called Targeted Investment Program under TARP.

<sup>24</sup> Branches of foreign banks are covered in the Australian and US programmes, but are subject to restrictions in participation (eg only in transaction account guarantee but not debt guarantee).

<sup>25</sup> The US scheme also admits US holding companies controlling at least one insured institution.

<sup>26</sup> Several programmes that started out with a maximum maturity of three years subsequently extended the maximum to five years.

equals the issuer's median credit default swap (CDS) spreads over some historical period.<sup>27</sup> Individual countries, however, may impose caps on the CDS spread add-on (eg Italy and the Netherlands) or other surcharges (eg Germany for the unused part of granted guarantees, and Italy for issuance with maturity longer than two years).<sup>28</sup> Outside Europe, in Australia and Canada the tiered fee schedules are based on issuers' credit ratings.<sup>29</sup> A notable exception is the United States, where the fee varies only by maturity, without regard to the issuer's credit rating.<sup>30</sup>

With the exception of the US scheme, all others are opt-in frameworks, requiring eligible institutions to apply for guarantees by a certain deadline. The **issuance window** varies. For the EU schemes in the sample, the window closes at the end of December 2009. The issuance windows of the two North American schemes were set to close relatively early when the schemes were first launched, but were later extended. In Australia, the application deadline and issue-by date are not specified and will depend on market conditions. Most programmes' guarantee **coverage** expires when the guaranteed instrument matures. Taking the issuance deadline and maximum maturity as a reference, coverage would expire at end-December 2014 at the latest in most cases. Coverage for the two schemes with no maximum limit on the maturity for eligible instruments is either set to end on a fixed date (United States) or capped at a fixed time period after issuance (three years for Canada), even if some guaranteed instruments have yet to mature.<sup>31</sup>

### Debt guarantee: standalone actions

There are only two standalone actions in debt guarantees: one for Dexia (France, in concert with Belgium and Luxembourg) and one for Hypo Real Estate (Germany). Unlike the programme guarantees, which are meant for sound financial institutions, these two standalone actions are aimed at supporting more troubled institutions.

The guarantee for **Dexia SA** and some of its subsidiaries and their overseas branches has some features that are similar to those of programme guarantees in Europe. It guarantees up to €150 billion of senior unsecured non-complex debt, including money market transactions.<sup>32</sup> Eligible instruments are not restricted in terms of minimum maturity, but must mature by 31 October 2011, when the coverage will end. The issuance period ends on 31 October 2009, somewhat earlier than for most programmes. The fee is also based on a base fee and a CDS spread add-on, but includes an additional category for short-dated

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<sup>27</sup> For issuers with no CDS, the add-on can be calculated based on the CDS of institutions similar by ratings or other characteristics.

<sup>28</sup> In the special case of France, banks borrowing from SFEF need to provide collateral and are charged fees and interest reflecting normal market rates. According to market reports, borrowers pay the equivalent of their median five-year CDS spread from 1 January 2007 to 31 August 2008 plus a standard fee of 20 basis points. In addition, interest charges depend on SFEF's own refinancing costs.

<sup>29</sup> In Canada, a surcharge applies for foreign currency denominated issuances.

<sup>30</sup> There is an add-on for holding companies. A new surcharge also applies under the extended issuance period announced in February 2009.

<sup>31</sup> After the extension and expansion of the US scheme, the guarantee on debt issued prior to 1 April 2009 will still expire no later than 30 June 2012. The guarantee on new debt issued after 1 April 2009 will expire on the earliest of 31 December 2012, the stated maturity date, or the mandatory conversion date for mandatory convertible debt. For the Canadian scheme, the guarantee expires on 31 December 2012 at the latest, given the new issue-by date and the three-year coverage cap.

<sup>32</sup> France guarantees up to 36.5% of the total (€54.75 billion), Belgium up to 60.5% (€90.75 billion) and Luxembourg up to 3% (€4.5 billion).

instruments (less than one month) at a more preferential 25 basis points per annum. Dexia can opt out on some issues.

The guarantees provided by the German authorities to **Hypo Real Estate** (HRE) outside the national scheme (which is run by SoFFin) are more complex and are designed specifically for securing credit from a private consortium of banks and the Deutsche Bundesbank. They include a state guarantee of €20 billion and a SoFFin-guaranteed HRE note of €15 billion eligible for Eurosystem refinancing, both with maturity at end-March 2009 (later extended to end-December 2009). The two guarantees supplement a secured HRE note (€15 billion) subordinated by a German financing consortium in exchange for HRE collaterals (€60 billion) that were not eligible for Eurosystem refinancing.<sup>33</sup>

## Asset purchases

In contrast to recapitalisation and debt guarantee, the purchase of legacy assets has not been widely adopted. Table A4 provides an overview of the few legacy asset purchase programmes and standalone actions in the sample.<sup>34</sup>

Although the US *Troubled Asset Relief Program* (**TARP**) was the first legacy asset purchase plan to be announced (on 3 October 2008), it has subsequently been used more as a recapitalisation fund. A true US asset purchase programme did not emerge until the announcement of the *Public-Private Investment Program* (PPIP) in February 2009 (see below).

Germany's **SoFFin** has a risk assumption facility that allows for the purchase of up to €5 billion of assets from each eligible institution. This facility taps the same €80 billion fund as SoFFin's recapitalisation facility (see above). The sellers of assets are subject to non-price conditions such as limits on dividend payments and remuneration. However, no assets seem to have been acquired by this facility. Instead, in May 2009 a draft law was passed to prepare the establishment of a new facility for credit institutions to swap their legacy assets (mainly structured instruments and their derivatives and hedges) for SoFFin-guaranteed bonds (expected amount up to €200 billion). The setup as outlined in the draft law suggests that this is more a guarantee rather than a purchase facility.

The first purchase actually implemented was the acquisition of assets from **UBS** by a Swiss National Bank (SNB) facility, an SPV called SNB StabFund. The SNB provides 90% of financing in the form of a secured long-term loan. UBS provides 10% capital and takes first loss. The SPV pays interest to the SNB on the loan. After full repayment of the loan, the SNB participates in profits generated by the SPV with \$1 billion up front and with 50% of eventually remaining equity value. The purchase targets mainly US real estate related assets but also includes some other securities. The final total amount of assets transferred was \$38.7 billion, lower than the original maximum (\$60 billion), after both parties had agreed not to transfer some assets. Some non-price conditions apply.

In the United States, the first instance of asset purchase was from **AIG** via two Federal Reserve-financed limited liability companies (LLCs), Maiden Lane II and III. The former is for purchasing up to \$22.5 billion of residential MBS (RMBS) from AIG's securities lending collateral portfolio. The latter is for purchasing up to \$30 billion of collateralised debt obligations (CDOs) on which AIG Financial Products had written CDS contracts. The Federal Reserve Bank of New York (FRBNY) provides financing to the LLCs with a six-year loan,

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<sup>33</sup> This package replaced, in November 2008, an earlier credit facility also partially secured by government guarantees.

<sup>34</sup> More countries have engaged in asset purchases from selected credit markets in order to support market-based (as opposed to bank-based) credit extension. Credit market interventions are not covered here.

while AIG provides \$6 billion in subordinated loans as capital to cover the first loss. The LLCs pay interest to the FRBNY on the loans. AIG can share in residual cash flows after the loans are repaid. \$20.8 billion of RMBS were bought in December 2008; the first tranche of CDOs (\$20.1 billion) was bought in November.

The **PPIP**, announced on 10 February 2009, sets out to do what the original TARP intended: to free banks' balance sheets from the burden of legacy assets. The programme has two components: the Legacy Loan Program (LLP) and the Legacy Securities Program (LSP). Purchases are to be financed 50-50 by private and public capital (the US Treasury plans to use about \$75–100 billion of TARP funds) as well as possible additional leverage provided or guaranteed by the authorities. In the LLP, pools of loans would be auctioned off to the highest bidding investor. In the LSP, a number of fund managers are authorised to invest in legacy securities.<sup>35</sup> As of June 2009, the LSP was awaiting the announcement of the list of eligible fund managers. There seems to be no firm implementation date yet for the LLP.

Somewhat different in scope is the **Bank of Japan's** offer to purchase up to ¥1 trillion of stocks held by financial institutions. This offer, announced on 3 February 2009, is a reintroduction of a previous stock purchase programme used from November 2002 to September 2004. Although this is not really a purchase of "toxic" assets in the Swiss or US sense of the term, it serves a similar purpose, ie to reduce financial institutions' exposure to market risk, thereby promoting financial stability. Between 23 February and end-June, the central bank purchased some ¥25.7 billion of stocks offered by banks.

### **Asset guarantees**<sup>36</sup>

Table A4 also outlines the main features of the few asset guarantees extended by the authorities in four countries. In all instances, the guarantees are highly customised for the beneficiary institution, even for the ones done under the UK programme framework.

In a package that included a \$20 billion capital injection announced in November 2008 (see above), the US Treasury and the Federal Deposit Insurance Corporation (FDIC) provided protection to **Citigroup** against large losses on \$301 billion in real estate and other illiquid assets. Citigroup pays a fee to the government in the form of \$7 billion of preferred shares. It bears the first \$29 billion of losses. The government shares 90% of subsequent losses (capped at \$15 billion). Any residual risk is backstopped by the Federal Reserve (at 90%) with a non-recourse loan (although interest payment at the overnight index swap rate plus 300 basis points per annum is with recourse). The insurance lasts for 10 years for real estate assets and five years for the rest. Citigroup is subject to compliance with an asset management template, restrictions on dividends to common shareholders, oversight of corporate governance and restrictions on executive compensation. In January 2009, a similar package was offered to **Bank of America (BoA)**. The insurance element covers a \$118 billion portfolio of real estate assets and derivatives that BoA had acquired from Merrill Lynch. BoA bears the first \$10 billion of losses and pays a fee in the form of \$4 billion of preferred shares and warrants. The length of coverage, the funding terms, the loss-sharing arrangement and other conditions are similar to those for Citigroup.

The UK **Asset Protection Scheme (APS)** was introduced in January 2009 as part of a second package of support measures.<sup>37</sup> Only two banks joined the scheme (the application

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<sup>35</sup> The LSP has the potential to link up with a prospective Legacy TALF (the original TALF accepts only top-graded ABS backed by consumer credit).

<sup>36</sup> See also Box 1.1 in the main text for a discussion of the pros and cons of asset guarantees.

<sup>37</sup> Under the APS, banks bear the first losses. The Treasury shares 90% of subsequent gains/losses. Eligible assets include corporate and leveraged loans, commercial and residential property loans, and structured



deadline has now expired). In return for insuring £325 billion of assets, **RBS** pays a fee of £6.5 billion in non-voting but dividend-paying B shares and gives up existing UK tax credits plus any new tax credits arising from future losses. It bears the first £19.5 billion of losses and commits to extend new lending of £25 billion in 2009. **Lloyds Banking Group** also joined the scheme to insure £260 billion of assets. It pays a fee of £15.6 billion to be used by the Treasury to buy the banking group's B shares. It bears a first loss of £25 billion and promises to increase lending for the 12-month period ending 1 March 2010 by £14 billion and by another £14 billion for the 12-month period thereafter.

A different setup is used in the Netherlands, where an illiquid assets backup facility was created in January 2009 to transfer to the state 80% of the risk from a \$35.1 billion portfolio of Alt-A mortgage securities at **ING** Direct USA and ING Insurance Americas. There is no first loss. The Dutch state and ING simply share the exposure 80-20. ING pays a premium and receives management and funding fees in return. Details of the premium and fees are not explicitly spelt out but are expressed in net present value terms. ING has agreed to grant €25 billion in credit to individuals and companies, suspend bonuses for its board of directors and abide by the corporate governance measures detailed in an earlier capital injection.

In November 2008, France extended a guarantee with Belgium to cover a \$16.98 billion asset portfolio of Financial Security Assurance (**FSA**), a US monoline insurer and a subsidiary of Dexia SA. Dexia bears the first loss of \$4.5 billion. France shares 37.6% of subsequent losses, while Belgium covers the rest. This joint action was effected in connection with the agreed purchase of FSA by Assured Guaranty from Dexia.

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credit assets held by participants as at 31 December 2008 and thereafter. The covered asset pool, the first loss and fees are determined on a case by case basis. Participants are subject to lending, asset management, reporting and disclosure requirements, as well as compliance with executive remuneration policy. Coverage is expected to last no less than five years.

**Table A2: Recapitalisation programmes – main features as of early June 2009**

Country <sup>1</sup>	First announced	Maximum amount	Instruments <sup>2</sup>	Pricing of instruments	Conditions <sup>3</sup>
FR (SPPE)	13 Oct 08	€40bn	PREF, SUB, and COM for troubled banks	SUB: fixed rate for first five years, variable rate thereafter. PREF: the higher of SUB cost + 25 bp and distributed dividends augmented by a coefficient	COMP, LEND, OTH
DE (SoFFin)	13 Oct 08	€80bn	Any means appropriate	Market-compatible compensation, preferential to participation rights of the existing proprietors	COMP, DIV, LEND, OTH
IT – 1 (MEF)	08 Oct 08	–	PREF	The highest of three options, with fees increasing over time	DIV, OTH
IT – 2 (MEF)	28 Nov 08	–	PERPSUB		COMP, DIV, LEND
JP (FSA)	17 Dec 08	¥12trn	PREF	Minimum spreads will be set by central bank at each auction	COMP, BOARD
JP (BoJ)	17 Mar 09	¥1trn	SUB, PERPSUB		
NL (MEF)	09 Oct 08	€20bn	Any means appropriate	Non-voting securities: 8.5% coupon, paid only if dividends are awarded in preceding year. If dividends exceed coupon, coupon will equal dividend augmented by a coefficient (110% first year, 120% second year, 125% thereafter)	
ES (MEF)	13 Oct 08	–	COM, PREF and/or non-voting shares		
GB (Treasury)	08 Oct 08	£50bn	COM, PREF	First round: COM: 8.5% discount to the closing price on 10 October 08. PREF: 12% annual dividend for five years, three-month sterling Libor + 700 bp thereafter	COMP, DIV, LEND, BOARD
US – CPP (Treasury)	13 Oct 08	\$250bn	PREF, WARR	PREF: 5% annual dividend for five years, 9% thereafter	COMP, DIV, OTH
US – CAP (Treasury)	10 Feb 09	–	MCP (converts after seven years), WARR	MCP: 9% annual dividend, paid quarterly. Conversion: 90% of average closing price for the common stock for the 20-trading day period ending 9 February 09	COMP, DIV, LEND, OTH

<sup>1</sup> Administrators in parentheses: BoJ = Bank of Japan; FSA = Financial Services Agency; MEF = Ministry of the Economy/Finance; SoFFin = Sonderfonds Finanzmarktstabilisierung; SPPE = Société de Prise de Participation de l'Etat. <sup>2</sup> COM = common/ordinary shares; MCP = mandatory convertible preferred shares; PERSUB = undated/perpetual subordinated debt/loan; PREF = preferred shares; SUB = subordinated debt; WARR = warrants. <sup>3</sup> BOARD = board appointment; COMP = executive compensation; DIV = dividend; LEND = lending commitments; OTH = others.

Sources: Central bank, government and company websites; press reports.

**Table A3: Debt guarantee programmes – main features as of early June 2009**

	First announced	Issue-by date	Coverage ends by†	Eligible institution	Eligible instruments		Maximum amount	Fee
					currency	maturity		
AU	12 Oct 08	–	–	DB, FB	All major	max 5 yrs	–	Varies with credit rating (3 tiers): 70, 100, 150 bp
CA	10 Oct 08	31 Dec 09	up to 3 yrs after issue	DB, FB	DC, FC	min 3 mths	– <sup>1</sup>	110 bp + (if no required rating) 25 bp + (if foreign currency) 20 bp
FR	13 Oct 08	31 Dec 09	<i>31 Dec 14</i>	SFEF <sup>2</sup>	DC, FC	max 5 yrs	€265bn	Base cost + borrowing bank's risk level <sup>3</sup>
DE	13 Oct 08	31 Dec 09	<i>31 Dec 14</i>	DB, FB, O	DC, FC	max 5 yrs	€400bn	% of borrowing amount + risk premium
IT	13 Oct 08	31 Dec 09	<i>31 Dec 14</i>	DB, FB	DC	3 mths to 5 yrs	– <sup>1</sup>	50 bp + (if > 1 yr) median 5-yr CDS spread Jan 07–Aug 08 + (if > 2 yrs) 50 bp
NL	14 Oct 08	31 Dec 09	<i>31 Dec 14</i>	DB, FB	DC, FC	3 mths to 5 yrs	€200bn	50 bp + (if > 1 yr) historical CDS spread
ES	13 Oct 08	15 Dec 09	<i>15 Dec 12</i>	DB, FB	DC, FC	3 mths to 3 yrs <sup>4</sup>	€100bn	Historical CDS spreads
GB	08 Oct 08	31 Dec 09	09 Apr 14 <sup>5</sup>	DB, FB	DC, FC	max 3 yrs	£250bn	50 bp + median 5-yr CDS spread Jul 07–Jul 08
US	14 Oct 08	31 Oct 09	31 Dec 12 <sup>6</sup>	DB, FB	DC, FC	> 30 days	\$2,250bn <sup>1</sup>	Varies with maturity (3 tiers): 50, 75, 100 bp; 10 bp add-on for bank holding company; new surcharge <sup>7</sup>

† Dates in italics are inferred from the issue-by date and the maximum maturity of eligible instruments. “–” = not specified; DB = domestic banks/credit institutions; FB = subsidiaries/branches of foreign banks; O = others (eg insurance companies, pension funds, money market funds); DC = domestic currency; FC = foreign currency.

<sup>1</sup> With known per-institution limit. <sup>2</sup> Guarantee applies to issuance by SFEF (Société de Financement de l'Economie Française), which in turn lends funds to credit institutions against collateral. <sup>3</sup> Cost for banks borrowing from SFEF. <sup>4</sup> Extendable to five years under exceptional circumstances. <sup>5</sup> Up to one third of guaranteed debt can be rolled over until this date. All guaranteed debt can be rolled over until 13 April 2012. <sup>6</sup> Latest guarantee expiration date for debt issued after 1 April 2009 (the extended issuance period). For debt issued prior to 1 April 2009, the guarantee still expires no later than 30 June 2012. <sup>7</sup> For debt (of at least one year) issued between 1 April and 30 June 2009 and maturing by 30 June 2012: 10 bp for insured depository institutions, 20 bp for others. For debt issued between 30 June and 31 October 2009, or debt issued after 1 April 2009 with maturity beyond 30 June 2012: 25 bp for insured depository institutions, 50 bp for others.

Sources: Central bank, government and company websites; press reports.

Table A4: Asset purchase and guarantee – main features as of early June 2009

	First announced	Beneficiary	Asset type	Purchase/insured amount	Beneficiary's share in loss		Fee/cost
					First	Subsequent	
FR <sup>§</sup>	14 Nov 08	Dexia/FSA	–	\$16.98bn <sup>1</sup>	\$4.5bn	–	–
DE: SoFFin	13 Oct 08	Banks, others	Wide range	max €80bn <sup>2</sup>			
DE: new facility <sup>§</sup>	13 May 09	Banks, others	Structured secs <sup>3</sup>	max €200bn			In line with market
JP: stock purchase	03 Feb 09 <sup>4</sup>	Banks	Stocks	max ¥1trn <sup>5</sup>			
NL: backup facility <sup>§</sup>	26 Jan 09	ING	Alt-A mortgages	\$35.1bn	None	20%	Not explicit
CH: SNB StabFund	16 Oct 08	UBS	Real estate related	\$38.7bn	10% capital	<sup>6</sup>	SNB loan: 1-m Libor + 250 bp; fee: \$1bn
GB: APS <sup>§</sup>	19 Jan 09	Banks, others	Wide range	–	Varies	10%	Varies
– under which	26 Feb 09	RBS		£325bn	£19.5bn	10%	£6.5bn <sup>7</sup> + tax credit
	07 Mar 09	Lloyds Banking Group		£260bn	£25bn	10%	£15.6bn <sup>7</sup>
US: Maiden Lane II	10 Nov 08	AIG	RMBS	max \$22.5bn	\$1bn	<sup>8</sup>	} Fed loan: 1-m Libor + 100 bp
US: Maiden Lane III	10 Nov 08	AIG	CDOs	max \$30bn	\$5bn	<sup>8</sup>	
US <sup>§</sup>	23 Nov 08	Citigroup	Real estate related	\$301bn	\$29bn	10%	\$7bn <sup>9</sup>
US <sup>§</sup>	16 Jan 09	Bank of America	Real estate related	max \$118bn	\$10bn	10%	\$4 bn <sup>9</sup>
US: PPIP	10 Feb 09	Banks	Real estate related securities & loans	about \$500bn			

§ indicates guarantee. “–” = specified. <sup>1</sup> An asset portfolio of FSA, a subsidiary of Dexia. France covers 37.6% of losses after first loss, Belgium covers the rest. <sup>2</sup> €5 billion per-institution limit. <sup>3</sup> And their derivatives and hedges held as of 31 December 2008. Mainly ABS, CDO, CLO, RMBS and CMBS. <sup>4</sup> Reintroduction of a previous programme. <sup>5</sup> ¥250 billion per-bank limit. <sup>6</sup> Can share in 50% of profits after repayment of loan, interest and fee due to the SNB. <sup>7</sup> In dividend-paying B shares. <sup>8</sup> Can share in residual cash flow (up to a limit) after repayment of loan and interest due to the Federal Reserve. <sup>9</sup> In preferred shares.

Sources: Central bank, government and company websites; press reports.

## References

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## 2. Effect of the government rescue measures on banks<sup>38</sup>

This chapter examines the impact of government rescue measures on bank risk and valuation by looking at the effects on banks' CDS premia and stock prices in 10 industrialised countries.<sup>39</sup>

Overall, government interventions have been effective in reducing banks' default risk as measured by CDS premia. On average, the announcement of system-wide rescue packages was followed by a fall in CDS premia, especially for announcements of capital injections. Bank CDS premia have shown a further reduction when the government measures were actually implemented, under both comprehensive rescue programmes and standalone initiatives. The reduction in CDS premia was also larger in countries where governments deployed more resources. We find positive spillover effects across countries, as in some cases CDS premia showed "early declines" after the announcements of packages by other countries.

The positive reaction of bank CDS premia to government interventions is consistent with our priors on the effects of such measures. Capital injections improve banks' capacity to absorb losses, thus strengthening creditors' protection. Guarantees on liabilities improve banks' funding liquidity, thus reducing the likelihood of financing shortfalls and bankruptcies. Finally, asset purchases or guarantees transfer part or all of the riskiness of banks' assets to governments, thus reducing the likelihood of future bank losses.

Unlike CDS spreads, stock prices did not show a positive reaction to government rescue measures. Although in some countries bank equities rose immediately after the announcements, in all cases prices eventually fell substantially below their pre-announcement levels. This might reflect several factors. First, capital injections at low prices substantially dilute shareholders' earning rights. In some cases, governments intervened by subscribing common stock, thus also diluting shareholders' voting rights. Second, concerns about national governments becoming important stakeholders might have negatively affected investors' perception of banks' long-run profitability, thus contributing to the depression of market prices. Finally, in the first phase of the interventions the lack of a credible exit strategy for governments might have increased uncertainty, thus raising the risk premium on banks' equities.

Overall, our analysis suggests that rescue packages have contributed to reducing banks' probability of default, to the benefit of creditors and CDS protection sellers. This result has been achieved in part through the redistribution of resources from shareholders to creditors, which is reflected in the opposite reactions of banks' CDS premia and stock prices: while the former reverted to more normal levels after the interventions, the latter hardly recouped any losses.

The rest of the chapter is organised as follows. Section 2.1 examines the impact of government interventions on bank CDS premia, analysing both market-wide and bank-specific evidence and emphasising differences between developments in the United States and Europe. Section 2.2 examines the response of stock prices.

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<sup>38</sup> The analysis in this chapter includes government measures up to 9 April 2009, unless otherwise specified.

<sup>39</sup> Australia, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, the United Kingdom and the United States.

## 2.1 Impact on CDS premia

The analysis focuses on the measures undertaken between September 2008 and the beginning of April 2009. We divide government interventions into three main categories: (i) capital injections (CI); (ii) debt guarantees (DG); and (iii) asset purchases and asset guarantees (APG). We first assess the market-wide impact of comprehensive rescue programmes, analysing the correlation between country-specific indices of bank CDS premia and the announcement of governments' commitment to support the banking sector. We then study how the actual deployment of government resources affected the CDS premia of individual institutions. Finally, we identify the main events that affected CDS premia since Lehman Brothers' bankruptcy and analyse cross-country differences in the reactions to these events.

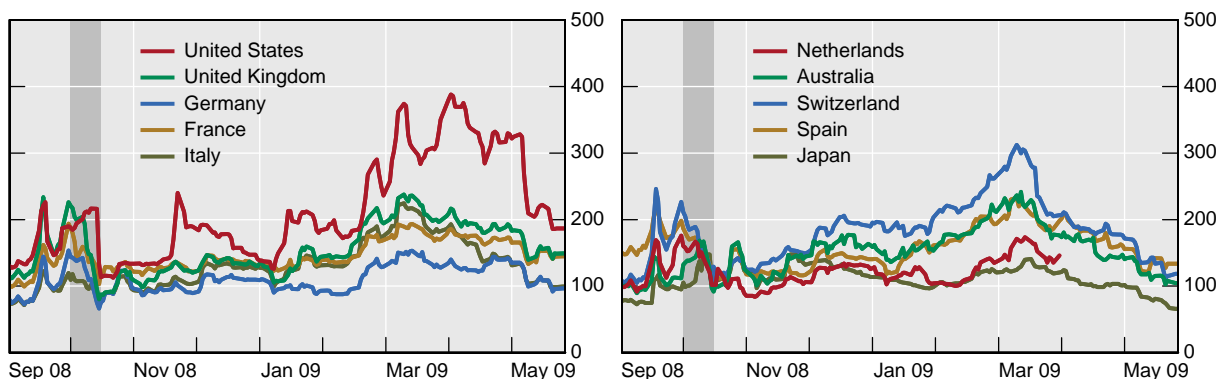
### 2.1.1 Market-level analysis

In this section, we consider only the announcements of packages with sector-wide scope (that is, government commitments to support the entire financial/banking sector, excluding measures targeting specific institutions). For each country, we compute an index of bank CDS premia (the simple average of the five-year CDS premia of all domestic banks considered), shown in Figure 2.1.<sup>40</sup> In most countries, CDS premia reached a peak at the end of September, reflecting the rise in uncertainty following the default by Lehman Brothers. By contrast, CDS spreads declined sharply in the first half of October (shaded area in the figure), following the adoption of systemic packages in most countries (see Section 1.1 in Chapter 1). From then on, premia remained quite steady in all countries except the United States until the beginning of 2009. In the first half of January, however, CDS started climbing again and peaked around mid-March in most countries, to then gradually return to levels closer to the pre-Lehman phase.

Figure 2.1

### Bank CDS premia

In basis points



Notes: The shaded area denotes the period of coordinated interventions (Oct 1 – 16), country indices are obtained as simple averages of the five-year CDS premia of a sample of large banks (see Annex Table 1).

Sources: Bloomberg; authors' calculations.

<sup>40</sup> Annex Table 1 reports the list of the 41 large international banks included in the study. We base our main discussion on bank CDS premia, without controlling for “general market conditions”, as represented by some benchmark CDS index. This choice makes the presentation simpler and more straightforward, and it does not affect our main conclusions (all our main results are unchanged if we consider the behaviour of bank CDS premia relative to a non-bank benchmark).

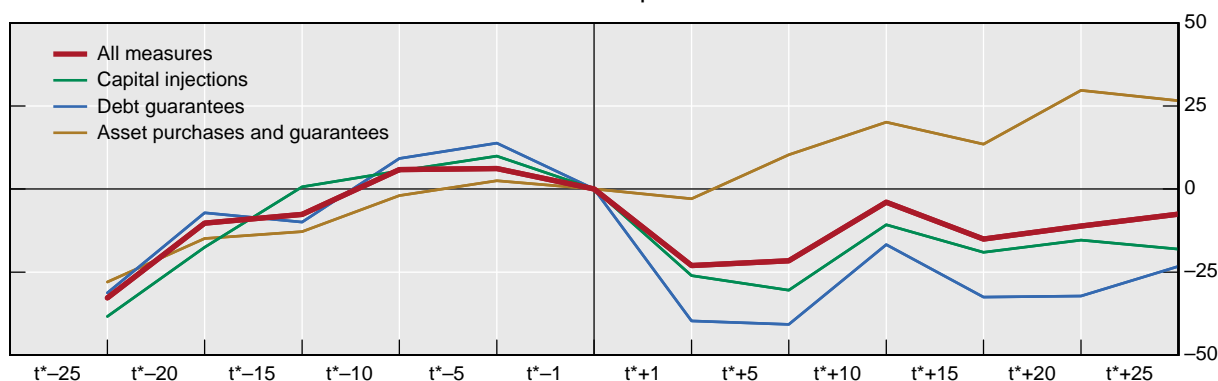
A comparable pattern was observed in bank senior unsecured bond spreads, which are an alternative indicator of market perception of the riskiness of financial institutions (see Box 2.1).

The interventions generated spillover effects across countries: in the euro area, CDS premia began to decline as early as 3–8 October, when the US and UK plans were announced but before the announcement of the European plans. Similarly, the European announcement, on 12 October, coincided with a further reduction of the differential in the United Kingdom and the United States.

In order to examine the impact of the interventions, we conduct an event study. For each announcement date (denoted  $t^*$ ), we examine the behaviour of our CDS index over a 50-day window including 25 trading days before and after  $t^*$ .<sup>41</sup> We allow for more than one “event” for each country: for example, if two different programmes are announced on different days in the same country, we include both in the event study.

Figure 2.2

**Changes in bank CDS premia: market-level analysis by type of measure<sup>1</sup>**  
In basis points



<sup>1</sup> Cumulative change in CDS premia before and after government interventions. The symbol  $t^*$  denotes the announcement day. Results are reported separately for capital injections, debt guarantees and asset purchases and guarantees.

Sources: Bloomberg; company and government/central bank websites; press reports; authors’ calculations.

The results, shown in Figure 2.2, suggest that the packages had a strong impact on bank CDS premia.<sup>42</sup> If all programmes are considered, the announcements reduced the level of CDS premia by about 20 basis points in the three days surrounding the announcement (ie from  $t^*-1$  to  $t^*+1$ ) and by 30 basis points from  $t^*-5$  to  $t^*+1$  (the fact that the reduction starts before  $t^*$  suggests that markets anticipated the interventions before the announcement).

<sup>41</sup> In an event-study, results depend on the choice of the event date and the length of the time window. For example, investors could have anticipated the content of the rescue measures (and acted accordingly) before the official announcement. Our choice of defining  $t^*$  as the date on which government measures are publicly announced seems nonetheless well suited to analyse market response via CDS premia and stock prices. A list of the events included in this and all other analyses in this chapter is available from the authors upon request.

<sup>42</sup> As is usual with event studies, which suffer from a number of well-known limitations, results have to be interpreted with caution. First, it is unclear what the correct counterfactual experiment would be (i.e. what would have happened to CDS spreads in the absence of the interventions). Second, if markets expected packages of a given size or scope, the reaction to the announcement would likely be affected by those priors. Third, by focusing on bank CDS premia, we do not consider the potential positive effects of the support measures on the overall economy (at least insofar as they help to avoid a sharp reduction in the supply of bank credit, which could have had a severe impact on the real economy).



From day  $t^*+5$ , CDS premia stabilise and eventually drift upwards again, offsetting part of the previous improvement.

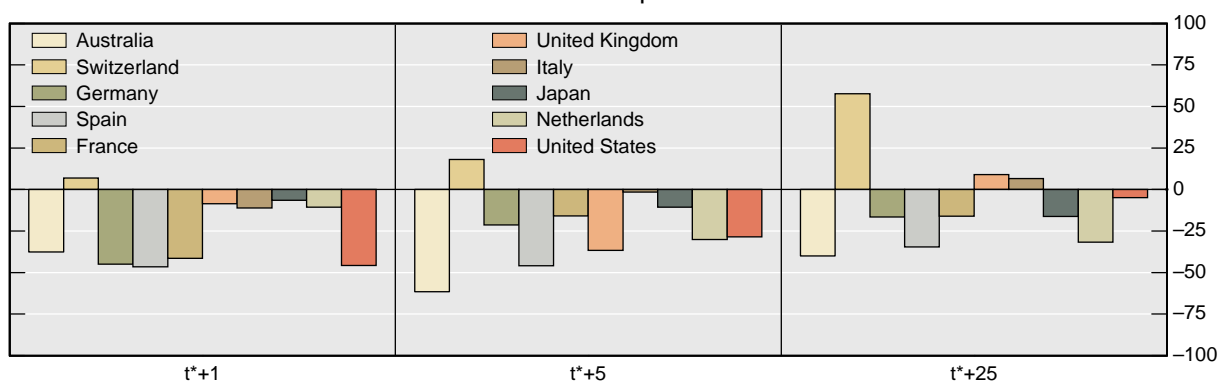
The average performance just described conceals different patterns for different types of measures. The reduction of spreads is more pronounced for DG (about 40 basis points from  $t^*-1$  to  $t^*+1$  and 55 basis points from  $t^*-5$  to  $t^*+1$ ) and CI (about 30 and 40 basis points in the two time windows, respectively). In contrast, the announcement of asset purchase/insurance schemes does not seem to influence CDS spreads.

The results for individual countries indicate that the announcements of the measures had a positive short-run impact (reducing CDS spreads) in all markets except Switzerland (Figure 2.3), although over a longer time span (25 days) the effect is reabsorbed in both Italy and the United Kingdom.

Figure 2.3

### Changes in bank CDS premia: market-level analysis by country<sup>1</sup>

In basis points



<sup>1</sup> Cumulative change in CDS premia after government interventions. The symbol  $t^*$  denotes the day on which government interventions are announced.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

#### Box 2.1

### Secondary spreads on unsecured bank debt

Figure A shows developments in bank bond spreads for six countries from September 2008 to the end of June 2009. These spreads, expressed in basis points, are relative to an underlying government benchmark bond with a similar maturity. The figures show the average secondary market spread for benchmark senior unsecured bonds and subordinated bonds, based on fixed rate, bullet issues with an average maturity between three and five years. For completeness, government-guaranteed bond spreads are also shown as a benchmark to highlight bank risk relative to other factors (see Chapter 3 for a deeper analysis of guaranteed bond spreads and other characteristics).

Following the bankruptcy of Lehman Brothers in mid-September, credit spreads widened dramatically in all countries except Germany, reflecting increased risk aversion, reduced liquidity in secondary markets and greater volatility across a range of asset markets. The announcement of bank rescue packages in mid-October did allow bank bond spreads to stabilise or to narrow in several countries. In the United States, for example, the average spread on senior or subordinated debt narrowed by over 300 basis points, albeit from very distressed levels. In other countries such as Germany, however, bank bond spreads remained at stubbornly high levels or continued to widen. In early 2009, bank spreads widened again as the initial optimism about the outlook for the macroeconomy was dashed by a series of negative revisions to GDP growth rates across a range of advanced and emerging economies. Market participants again grew sceptical about the financial condition of banks and, possibly, the credibility of government promises to protect creditors.

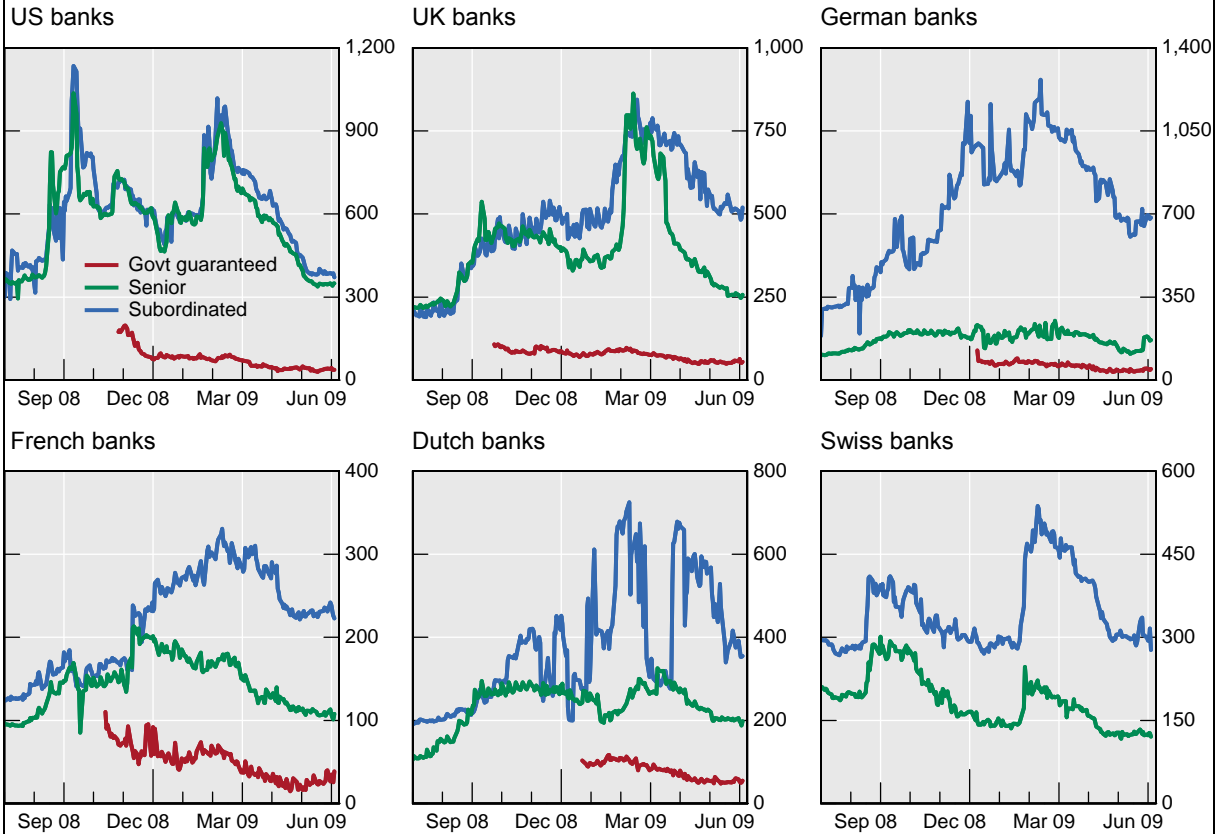
Box 2.1

**Secondary spreads on unsecured bank debt (cont)**

Figure A

**Bank debt spreads over government benchmarks**

Unweighted average of the banks indicated, in basis points



Sources: Bloomberg; BIS calculations.

After peaking in March 2009 in most countries, spreads later recovered steadily up to the end of June: by mid-2009, spreads on senior unsecured debt in most countries and on subordinated debt in the United States and Switzerland had recovered to their pre-Lehman levels. Spreads on subordinated debt in the United Kingdom, Germany, France and the Netherlands also narrowed but remained at elevated levels. The fall in spreads was probably driven by a return of risk appetite, reflected in rising stock markets and falling volatility, as well as the reduced uncertainty about banks' financial health following stress tests in many countries. However, despite these positive developments, the significant premium between government guaranteed bank debt and unsecured bank debt remained, particularly in the United States, the United Kingdom, France and the Netherlands.

Some banks took advantage of the dramatic decline in prices to repurchase subordinated debt below par in the secondary market. These repurchases served two purposes. First, to the extent that the debt is retired and not refinanced, these actions reduced the banks' leverage. Second, the purchases increased the banks' capital because the difference between the book value of the debt and the market price at which it is repurchased can be booked as a capital gain, increasing bank profits and retained earnings.

Our next step is to examine whether the *size* of the measures announced also matters. In principle, one would expect the decline in bank CDS premia to be proportional to the amount of resources made available by governments. To examine this issue, in Table 2.1 we

correlate the change in CDS premia over a horizon of one, five and 15 days with the amount of resources pledged for capital injections and debt guarantees in a given country.<sup>43</sup>

The results indicate that the size of the interventions matters: for both CI and DG, the correlation coefficients are generally negative, suggesting that larger programmes are associated with bigger reductions in CDS premia.<sup>44</sup> The correlations are larger when we normalise recapitalisations by aggregate assets or loans and debt guarantees by aggregate wholesale liabilities. This is not surprising: the first ratio (the resources pledged for CI as a percentage of assets or loans) is a proxy for the reduction in bank leverage, while the amount of DG scaled by wholesale liabilities is a proxy for the reduction in refinancing risk.

Table 2.1

**Correlation between the size of the measures and the change in bank CDS premia: market-level analysis**

Correlation between  $t^*-1$  and  $t^*+1$ ,  $t^*+5$ ,  $t^*+15$

Time window (no of days)	Measures scaled by:			
	Total bank assets	Total bank loans	Total wholesale bank liabilities	Total bank capital
	<b>Capital injections (eight observations)</b>			
1	-0.70*	-0.67*	-0.61	-0.45
5	-0.57	-0.80*	-0.49	-0.34
15	-0.54	-0.63*	-0.51	-0.26
	<b>Debt guarantees (six observations)</b>			
1	-0.73	-0.52	-0.85*	-0.15
5	-0.42	-0.65	-0.51	0.05
15	-0.60	-0.74*	-0.65	-0.19

The table reports correlations between the size of measures and the change in market-level bank CDS spreads between  $t^*-1$  and  $t^*+1$ ,  $t^*+5$ ,  $t^*+15$  (\* denotes significance at 10%). The symbol  $t^*$  denotes the day on which government interventions are announced. The size of the measures is normalised using market-specific variables.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

In order to shed further light on the nature of these correlations, we regress the change in CDS premia (over the three different horizons) on the amount of resources pledged, including all three types of measures (that is, CI, DG and APG) and scaling interventions by both bank assets and total loans.<sup>45</sup> We include one dummy for each type of measure, in order to examine the effectiveness of the measures. The results, shown in Table 2.2, confirm

<sup>43</sup> We normalise the size of the measures by GDP and by four different measures of the overall size of the banking system in each country. We do not examine asset purchase/insurance measures, as we have only two observations.

<sup>44</sup> A weak correlation emerges when the size of the measures is normalised by GDP, reflecting cross-country heterogeneities in the size of the banking sector relative to the real economy.

<sup>45</sup> A potential endogeneity problem arises with this simple specification, as the amount of resources deployed by each government is presumably commensurate with the severity of the banking sector problems at hand.

that the size of the programmes did have an impact on the reduction in CDS spreads: coefficients are generally negative and significant, in spite of the very small number of observations. Among the different measures, CI seem to be more effective than DG and APG: the dummy for CI is negative and very significant (while the dummies for DG and APG are statistically not different from zero). From an economic point of view, our estimates suggest that the announcement of a capital injection of 1 percentage point of total bank assets would reduce CDS premia by around 30 basis points after 15 working days.

Table 2.2

**Market-level analysis: regression results**

	Dependent variable ( <i>p</i> -values in parentheses)					
	$\Delta\text{CDS}_{t^*+1}$	$\Delta\text{CDS}_{t^*+5}$	$\Delta\text{CDS}_{t^*+15}$	$\Delta\text{CDS}_{t^*+1}$	$\Delta\text{CDS}_{t^*+5}$	$\Delta\text{CDS}_{t^*+15}$
Amounts:						
as a % of total banking sector assets	-3.9 <sup>*</sup> (0.06)	-3.5 (0.33)	-3.1 (0.18)			
as a % of total banking sector loans				-2.0 (0.14)	-3.7 <sup>*</sup> (0.09)	-2.6 <sup>*</sup> (0.07)
Dummy CI	-25.9 <sup>***</sup> (0.01)	-33.1 <sup>*</sup> (0.06)	-32.9 <sup>***</sup> (0.00)	-24.4 <sup>**</sup> (0.02)	-27.3 <sup>*</sup> (0.10)	-29.5 <sup>***</sup> (0.01)
Dummy DG	-22.9 (0.20)	-27.7 (0.38)	-23.9 (0.24)	-13.6 (0.60)	16.1 (0.70)	2.1 (0.93)
Dummy APG	1.7 (0.92)	-35.4 (0.29)	22.6 (0.29)	1.5 (0.93)	36.7 (0.23)	23.3 (0.25)
R <sup>2</sup>	0.76	0.55	0.71	0.73	0.62	0.75
Adjusted R <sup>2</sup>	0.69	0.40	0.61	0.64	0.49	0.66
No of observations	16	16	16	16	16	16

The dependent variable is the cumulative change in CDS premia after government interventions, in basis points. The symbol *t*\* denotes the day on which government interventions are announced. The dummies indicate different types of measures: CI (capital injections), DG (debt guarantees) and APG (asset purchases and guarantees).

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

### 2.1.2 Bank-level analysis<sup>46</sup>

The preceding subsection examined how the announcements of market-wide measures affected the perceived riskiness of the overall banking sector. Here, we examine how CDS premia of *individual* banks were affected by the announcement that specific banks would

<sup>46</sup> In this section, the cut-off date for debt guarantees is 23 April 2009 and data only refer to publicly issued bonds.

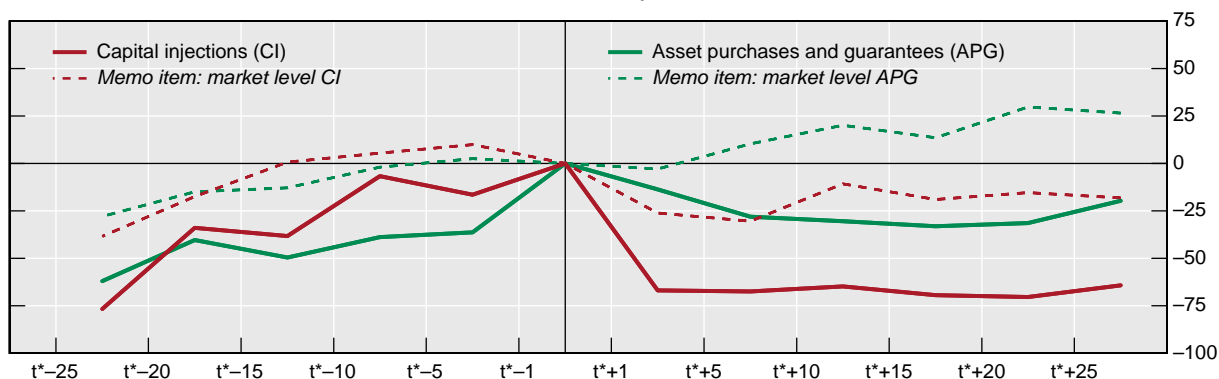
receive government support.<sup>47</sup> As in the previous aggregate analysis, we report the results of an event study, a correlation analysis and a simple regression analysis.<sup>48</sup>

Two differences emerge from the bank-level event study relative to the market-level analysis. First, the positive impact of CI measures may have been more pronounced than previously estimated: after a capital injection, the average CDS spread decreases by more than 60 basis points, and remains roughly constant thereafter (see Figure 2.4).<sup>49</sup> Second, measures targeting banks' assets (APG) now contribute to lowering CDS premia from their peaks, although the effect is weaker than that of CI measures (recall that these measures were not effective at the market level).

Figure 2.4

**Changes in bank CDS premia: bank-level analysis by type of measure<sup>1</sup>**

In basis points



<sup>1</sup> Cumulative change in CDS premia before and after government interventions. The symbol t\* denotes the announcement day. Results are reported separately for capital injections, debt guarantees and asset purchases and guarantees.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

We then conduct a bank-level correlation analysis, in order to assess whether banks receiving greater support have also experienced a larger reduction in their CDS spreads.<sup>50</sup> The results, reported in Table 2.3, confirm the negative correlation between the amount of capital injections and the reduction in CDS premia. In contrast, APG display a positive correlation, especially in the very short run. This counterintuitive result could reflect the fact that these actions were directed at the most troubled institutions, so that markets might have interpreted the announcement of government intervention as a negative signal on the state of

<sup>47</sup> For example, in the case of a bank participating in a national recapitalisation scheme, the announcement date (t\*) will refer to the day on which it was publicly announced that the specific institution would receive capital assistance under that programme, regardless of the announcement date for the programme.

<sup>48</sup> Only banks for which CDS data were publicly available are included in the sample (see Annex Table 1). We do not include DG schemes in the event study, as banks participating in those schemes usually issued many bonds at very close intervals, making it very difficult to identify the effects of each issue.

<sup>49</sup> As a robustness check, we repeat the event study for CI excluding the measures implemented around mid-October, when most comprehensive plans were also implemented, so as to control for the potential confounding effects that might arise from the overlap between systemic and bank-specific measures. The results (unreported) confirm the fall in banks' CDS premia from their peaks, although the effect is less pronounced than that reported in Figure 2.4.

<sup>50</sup> The resources received by each bank are normalised using bank-specific variables such as stock market capitalisation and balance-sheet items.

health of the banks involved; however, it is worth noting that the number of observations used in the calculations is extremely small.

Table 2.3  
**Correlation between the size of the measures and the change  
in bank CDS premia: bank-level analysis**

Time window (no of days)	Interventions scaled by:			
	Market capitalisation	Total assets	Total loans	Shareholder equity
	<b>Capital injections (27 observations)</b>			
1	-0.15	-0.25	-0.42*	-0.25
5	-0.19	-0.36*	-0.53*	-0.18
15	-0.16	-0.36*	-0.50*	-0.25
	<b>Asset purchases/guarantees (six observations)</b>			
1	0.33	0.91*	0.84*	0.92*
5	-0.16	0.29	0.22	0.44
15	-0.21	0.07	0.06	0.24

The table reports the correlations between the size of the support granted to individual banks and the change in the bank's CDS spread between  $t^*-1$  and  $t^*+1$ ,  $t^*+5$ ,  $t^*+15$ . The symbol  $t^*$  refers to the day on which government interventions are announced. The size of the measures is normalised using bank-specific variables.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

Regression analysis corroborates the view that the reduction of the CDS spreads depends on the amount of the resources pledged by the government, especially over the longer horizons.<sup>51</sup> As in previous cases, capital injections seem to be more effective. In particular, similarly to the market-level analysis of the previous section, our findings suggest that a capital injection equal to 1 percentage point of the bank's assets reduces the CDS spread by about 30 basis points. The coefficients of the other two types of measures (DG and APG) are smaller and often not significant.<sup>52</sup>

<sup>51</sup> A potential endogeneity problem arises, as the size of the interventions is likely correlated to the severity of the problems experienced by a given institution.

<sup>52</sup> The coefficients on the DG dummy are weakly significant over the  $t^*+5$  and  $t^*+15$  horizons. However, results over horizons longer than one day are difficult to interpret. In fact, most banks participating in DG programmes issued several government-guaranteed bonds in the period examined. Thus, the DG "events" considered have a significant degree of overlap. As a robustness check, we rerun our regressions excluding DG measures. Results do not change.

Table 2.4

**Bank-level analysis: regression results**

	Dependent variable ( <i>p</i> -values in parentheses)					
	$\Delta\text{CDS}_{t^*+1}$	$\Delta\text{CDS}_{t^*+5}$	$\Delta\text{CDS}_{t^*+15}$	$\Delta\text{CDS}_{t^*+1}$	$\Delta\text{CDS}_{t^*+5}$	$\Delta\text{CDS}_{t^*+15}$
Amounts:						
as a % of balance-sheet assets	-1.0 (0.40)	-8.0*** (0.00)	-7.3*** (0.00)			
as a % of balance-sheet loans				-0.5 (0.24)	-2.6*** (0.00)	-2.9*** (0.00)
Dummy CI	-31.6*** (0.00)	-26.7*** (0.00)	-31.3*** (0.00)	-31.7*** (0.00)	-29.7*** (0.00)	-33.0*** (0.00)
Dummy DG	1.1 (0.26)	2.6* (0.07)	3.7* (0.09)	1.2 (0.24)	2.6* (0.08)	3.9* (0.07)
Dummy APG	-19.6** (0.03)	8.5 (0.50)	5.6 (0.77)	-18.1** (0.04)	4.7 (0.70)	8.6 (0.64)
R <sup>2</sup>	0.19	0.17	0.09	0.19	0.17	0.10
Adjusted R <sup>2</sup>	0.18	0.16	0.08	0.19	0.16	0.09
No of observations	382	382	382	382	382	382

The dependent variable is the cumulative change in CDS premia after government interventions, in basis points. The symbol  $t^*$  denotes the day on which government interventions are announced. The dummies indicate different types of measures: CI (capital injections), DG (debt guarantees) and APG (asset purchases and guarantees).

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

**2.1.3 Country-level analysis**

This subsection briefly examines the movements in bank CDS spreads in the United States and the main European markets around key events related to the interventions or to important developments in the financial crisis.

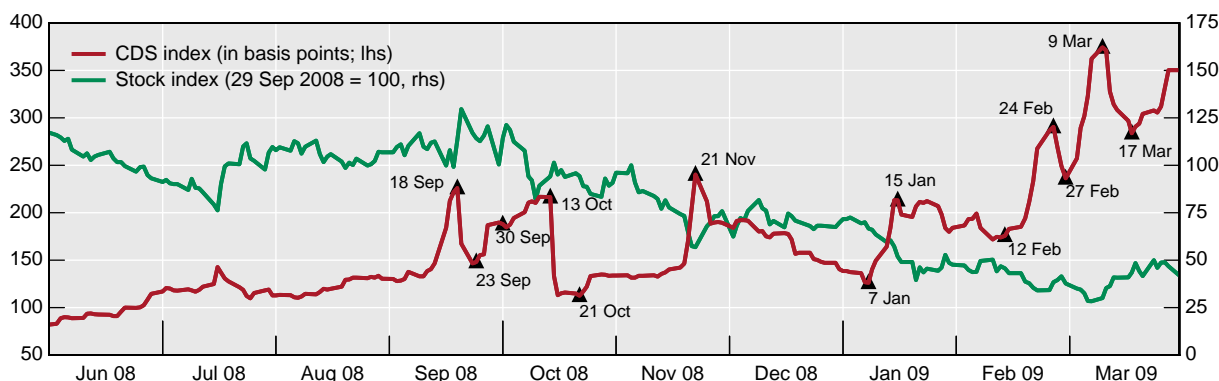
While we find evidence of spillover effects, whereby the measures taken in one country benefited banks in other countries as well, we also find that the CDS premia of US banks behaved differently from those of European banks between mid-October and the beginning of January: after most national packages were announced CDS premia stabilised in Europe, while they remained volatile in the United States in response to new problems and more government interventions. Since January, developments in CDS premia have become similar in all countries, with premia resuming their upward trend, amid deteriorating economic conditions and more problems at major banks. Nonetheless, the new measures announced by the US government since January seem to have provided some relief. In mid-March, a reduction in banks' CDS premia began, sustained by a flow of positive news that hinted at an improvement in the profitability of banks and a progressive stabilisation of financial markets.

(a) *United States*

In Figure 2.5, we report an index of CDS spreads for US banks, together with an index of bank stock prices.<sup>53</sup> In Table 2.5, we also report the changes in the CDS premia of the US banks included in our index over the period from June 2008 to March 2009, dividing the entire period into a number of subperiods defined by key events. Overall, the most pronounced swings in the dynamics of US CDS premia were registered in response to these key events.

Figure 2.5

**CDS premia and stock prices of US banks**



Sources: Bloomberg; Datastream; authors' calculations.

The rise in CDS premia that began in May–June 2008 culminated on 18 September, shortly after the Lehman bankruptcy (15 September) and the rescue of AIG (16 September). Immediately after the press conference held by the US government on 19 September, at which a draft law for the Troubled Asset Relief Program (TARP) was unveiled, CDS premia sharply contracted. After 23 September, however, CDS premia increased again, reflecting the difficulties encountered in converting the rescue packages into legislation and market concerns over how effective the measures would be in restoring the soundness of US banks. This upward trend continued until 14 October, when the government substantially revamped its rescue plan, pledging part of the TARP money to recapitalise banks. Following this decision, the CDS premia of the major US banks experienced a new sharp reduction. Starting on 21 October, the US financial system was hit by a number of critical events emanating from key (systemic) individual domestic financial institutions and from developing countries. CDS premia started to rise again, in spite of the intervention by the US authorities.

After the turn of the year, CDS premia were pushed upwards by renewed concerns about the depth and duration of the recession and about its impact on banks' balance sheets. Additional interventions by the US authorities provided only temporary relief. The rise in the CDS premia of US banks appeared to come to an end only at the beginning of March, after Citigroup announced its return to profitability in the first part of 2009 and communicated that it expected to remain profitable throughout the year. Other banks made similar announcements, while yet others expressed the intention of returning government funds as soon as possible.

<sup>53</sup> The CDS index is a simple average of the five-year CDS premia for six big US banks (see Annex Table 1). The stock price index is taken from Datastream.



Table 2.5

## Timeline of events and changes in the CDS premia of US banks

Time window	Event dates	Event	US banks	US non-fin	Difference	BoA	Citigroup	JPMorgan	Wells Fargo
01 Jun 08	18 Sep 08	15 Sep	144	24	120	119	226	98	133
		16 Sep							
		First rescue package for AIG							
18 Sep 08	23 Sep 08	19 Sep	-78	-8	-70	-56	-148	-40	-66
23 Sep 08	30 Sep 08								
		TARP legislation encounters political opposition							
		29 Sep							
		Bailout bill defeated in US House of Representatives							
		Citigroup to acquire banking operations of Wachovia	40	3	37	13	115	9	21
30 Sep 08	13 Oct 08	03 Oct	28	40	-12	28	52	8	24
13 Oct 08	21 Oct 08	14 Oct							
		US announces that it will use TARP to recapitalise banks	-103	19	-122	-73	-191	-59	-90
21 Oct 08	20 Nov 08								
		Developing countries in financial distress seek help from IMF: Belarus (22 Oct),							
		Iceland (24 Oct), Ukraine and Hungary (26 Oct)	92	41	52	58	216	55	39
		17 Nov							
		Citigroup to slash 52,000 jobs; sees hard 2009							
20 Nov 08	07 Jan 09	23 Nov	-78	-38	-40	-51	-213	-37	-12
		25 Nov							
		Fed announces TALF and purchase of obligations and MBS of GSEs							
		02 Dec							
		Extension of several liquidity facilities to 30 Apr							
07 Jan 09	15 Jan 09	12 Jan	87	8	79	83	163	45	55
		15 Jan							
		Citigroup: \$18.1bn loss in Q4							
15 Jan 09	12 Feb 09	16 Jan	-37	-1	-36	-21	-47	-41	-39
		US government finalises loss-sharing programme with Citigroup and enters into a programme with Bank of America							
12 Feb 09	22 Feb 09		92	3	89	65	149	57	94
22 Feb 09	27 Feb 09	23 Feb							
		Joint statement by FDIC, FED, Treasury, Comptroller and Thrift Supervisor that they will stand behind the US banking system	-31	4	-35	-16	-48	-27	-32
		25 Feb							
		Stress tests announced							
27 Feb 09	08 Mar 09	02 Mar	126	19	107	133	188	80	101
08 Mar 09	17 Mar 09	09 Mar	-78	-7	-71	-71	-80	-71	-90
		Citigroup announces return to profitability in Q1 2009							
17 Mar 09	30 Mar 09		66	-17	83	69	95	42	57
		Details of PPIF released; TALF extended							

Sources: Bloomberg; authors' calculations.

(b) *Europe*

The developments in the US banking sector generated significant spillover effects on banks in the euro area.<sup>54</sup> The announcement of the draft law for TARP on 19 September was followed by an immediate improvement in CDS premia in Europe. In the following weeks, European CDS spreads widened in connection with the difficulties encountered by the US administration in converting the plan into legislation and decreased again when the plan was finally approved, well before the announcement of any measure by euro area governments. However, the improvement of European CDS premia before the announcement of the rescue plans (which took place between 13 and 14 October)<sup>55</sup> probably also reflected the fact that, given the ongoing discussions on international cooperation (the G20 finance ministers and central bank Governors met on 11 October, and EU leaders agreed on guidelines for national bank rescue plans on 12 October), investors had already anticipated the interventions before their announcements.

The reduction in premia continued until 21 October, reabsorbing most of the hike registered after Lehman's collapse. From end-October to the beginning of January, the CDS premia of large euro area banks remained stable, suggesting that government interventions had restored confidence in the banking system.

The dynamics of the CDS spreads of UK banks were broadly similar to those of euro area banks. On 8 October, the UK government announced a rescue package including CI and DG. The measures started to be implemented on 13 October, as new capital was injected into RBS, Lloyds TSB and HBOS. CDS premia dropped significantly until 21 October. As in the euro area, banks' CDS premia stabilised in a fairly tight range in the following weeks.

In early 2009, CDS spreads resumed their upward trend in all European countries, due to heightened concerns over the effects of the global economic recession. CDS premia improved again after mid-March, owing to the flow of positive news from international banks and the emergence of "green shoots".

## **2.2 Impact on stock prices**

To examine how banks' equity prices reacted to government interventions, in this section we carry out an analysis similar to that performed in Section 2.1 on CDS premia. We use different methodologies (event study, market-level analysis and country-level analysis), obtaining similar results: overall, we find no evidence of a significant response of bank stock prices to government interventions.

In what follows, we report only our main results. In Section 2.2.1, we assess the market-wide impact of announcements of comprehensive rescue packages, carrying out an event study. In Section 2.2.2, we briefly discuss cross-country differences in the behaviour of stock prices.

### **2.2.1 Market-level analysis**

Our event study focuses on the same countries and the same events considered for CDS spreads in Section 2.1.<sup>56</sup> For each announcement date (denoted by  $t^*$ ), we (i) take the time series of each country index between  $t^*-25$  and  $t^*+25$ , (ii) re-scale the index to be equal to

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<sup>54</sup> Timeline tables similar to Table 2.5 for the main euro area countries and for the United Kingdom are available from the authors upon request.

<sup>55</sup> With the exception of Italy, which had already announced possible capital injections on 8 October.

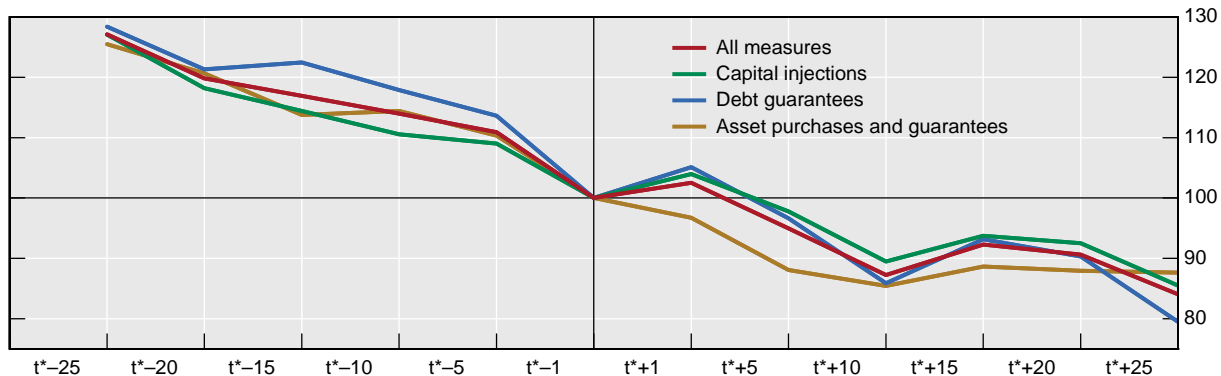
<sup>56</sup> Our country indices are the Datastream banks' stock indices.

100 at  $t^*-1$  and (iii) average the time series thus obtained across announcements. Results are reported in Figure 2.6.

Figure 2.6

**Bank stock prices: market-level analysis by type of measure<sup>1</sup>**

Index:  $t^*-1 = 100$



<sup>1</sup> The symbol  $t^*$  denotes the day on which government interventions are announced. Results are reported separately for capital injections, debt guarantees and asset purchases and guarantees.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

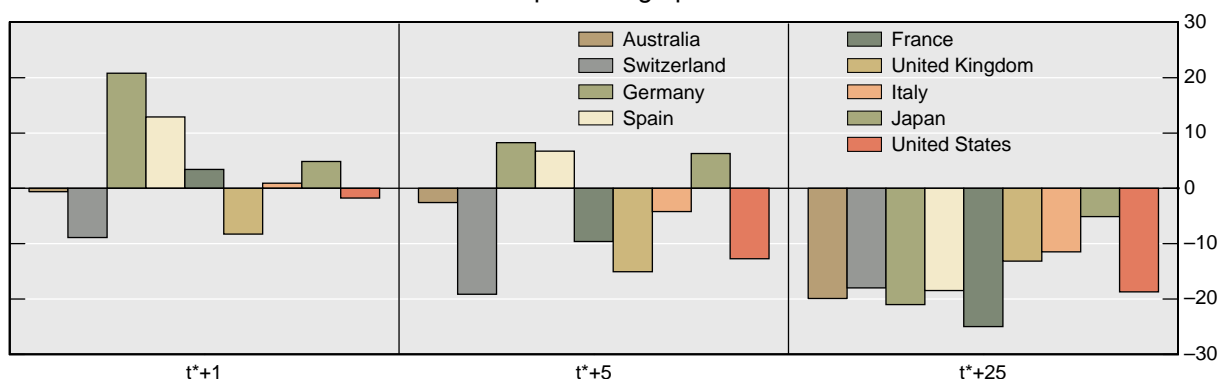
The announcements of comprehensive rescue packages do not seem to have had a positive impact on banks' equity prices. Immediately after the announcements, bank stocks experience modest gains. However, banks' equity prices resume their pre-announcement downward trend just a few days after the announcements. Over a 25-day horizon, they fall 15–20% below their pre-announcement level. No significant differences seem to emerge looking at the breakdown by type of measure.

The behaviour of stock prices is, on the other hand, heterogeneous across countries, but only in the days immediately after the announcements (see Figure 2.7). The stock market impact of the measures is positive in Germany, Spain and, to a lesser extent, Japan (with gains of about 5%). Over the entire 25-day period, however, stock prices fall substantially below their initial level in all countries.

Figure 2.7

**Changes in bank stock prices: market-level analysis by country<sup>1</sup>**

In percentage points



<sup>1</sup> Cumulative change in stock prices after government interventions. The symbol  $t^*$  denotes the day on which government interventions are announced.

Sources: Bloomberg; company and government/central bank websites; press reports; authors' calculations.

These results suggest that, although the rescue packages contributed to reducing the probability of default of banks, they were not sufficient to improve the attractiveness of investments in bank stocks. Government interventions reduced banks' riskiness but could not improve investors' expectations of their profitability. In fact, the stronger capital base provided by government capital injections made banks less risky and more resistant to shocks, but diluted investors' earnings rights. Furthermore, the fact that national governments became important stakeholders of banks, mostly without a clear exit strategy, may have negatively affected investors' perceptions about the long-run profitability of banks.

### **2.2.2 Country-level analysis**

Country-level analysis indicates that the reaction of stock prices to key announcements was homogeneous across banks and countries, if we exclude the very short-run impact. Hence, we do not report a detailed description for individual countries, as we did for CDS, but just summarise the main results.

As mentioned, government intervention did not generally provide much relief to bank stocks. A notable exception was the announcement of the draft law for TARP on 19 September, which revived bank stock prices both in the United States and in the other countries in our sample. The stock prices of US banks also rose significantly in the time window from 20 November to 7 January, when several other intervention measures were announced.

If these two exceptions are left aside, government interventions were only temporarily successful in stopping the decline in bank stocks. In European countries (with the exception of Switzerland), the decline in share prices was pronounced even in the period from 29 September to 21 October (which includes the announcement of the government interventions), in spite of the improvement in CDS premia in that time frame.

Rather than reacting to government interventions, stock prices seemed much more responsive to news on the future profitability of banks. For example, stock prices rose significantly after Citigroup announced, on 9 March, that the bank had returned to profitability in the first two months of 2009 and was expected to remain profitable throughout 2009. Other banks made similar announcements in the days that followed, triggering a rally in bank stock prices.

Annex Table 1

**Large international banks included in the sample**

<b>Australia</b>	<b>France</b>	<b>Germany</b>	<b>Italy</b>	<b>Japan</b>
Aus and NZ B Gr	BNP Paribas	Commerzbank	Banco Popolare	Mitsubishi UFJ
Commonwealth Bank	Crédit Agricole	Deutsche Bank	Intesa SP	Mizuho
Nat Austr Bank	Natixis	Bayerische H	Mediobanca	Sumitomo
Suncorp Metway	Soc Gén		Monte dei Paschi	
Westpac			Pop Milano	
			Unicredit	
<b>Netherlands</b>	<b>Spain</b>	<b>Switzerland</b>	<b>United Kingdom</b>	<b>United States</b>
ING	Banco Popular	Credit Suisse	Barclays	Bank of America
SNS	BBVA	UBS	HBOS	Citigroup
	Santander		HSBC	Goldman Sachs
			Lloyds TBS	JPMorgan
			RBS	Morgan Stanley
			Stand Chart	Wells Fargo

### 3. Guaranteed bonds

Over the last few months, the issuance of government-guaranteed bank bonds has been sizeable across regions and has provided banks with an important source of funding. As of end-May 2009, roughly 900 bonds totalling around the equivalent of €700 billion had been issued worldwide by more than 140 banks. In the period from October 2008 to May 2009, issuance of guaranteed bonds in all regions accounted for roughly 50% of total bond issuance by banks. This section examines first the quantities issued at both country and bank level, with a view to examining possible crowding-out effects. The analysis then turns to the factors underlying the significant tiering of spreads observed across issuers.

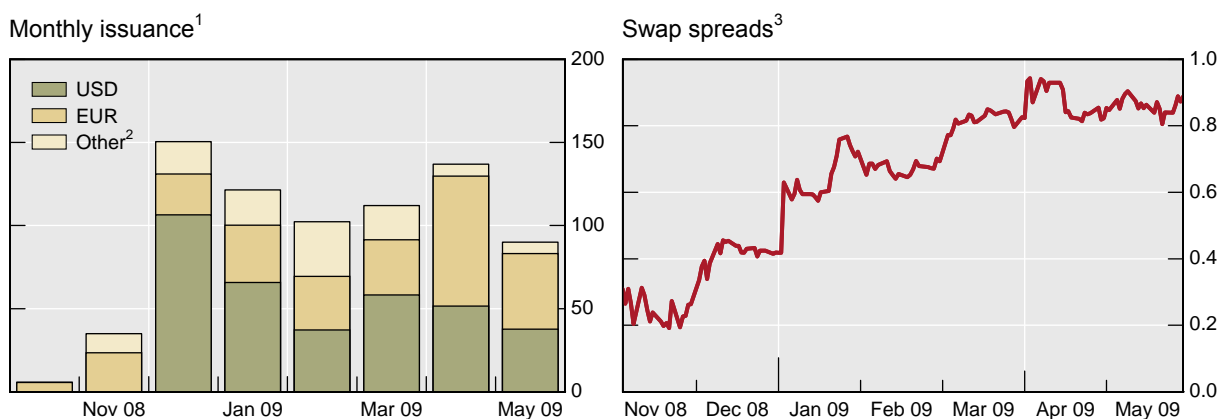
#### 3.1 Features of guaranteed issuance: size, currencies, maturities

*Evolution of issuance and spreads.* In Figure 3.1 (left-hand panel), we show the evolution of the issuance of guaranteed bonds per currency. In October–November 2008, the volume issued was subdued, as only European banks were issuing. Between December 2008, when US and Australian financial institutions started to issue, and March 2009 total issuance picked up, with the US dollar becoming the main currency of denomination. The issuance in euros remained stable, while the share of other currencies (sterling, yen, Australian dollar) increased sharply. In April and May, the issuance of guaranteed bonds remained strong, in spite of the increase in investors' appetite for risk.<sup>57</sup>

The evolution of guaranteed bond prices was apparently unrelated to the evolution of quantities: the average spread over the asset swap of a basket (iBoxx by Markit) of euro-denominated guaranteed issues with two-year maturity has been rising in a step-wise fashion, reaching in April a range of 80–100 basis points, and stabilising thereafter (Figure 3.1, right-hand panel).

Figure 3.1

#### Issuance and swap spreads of guaranteed bonds



<sup>1</sup> Amounts converted into euros using the exchange rate of the day of issuance, in billions of euro. <sup>2</sup> The most relevant are sterling and the Australian dollar. <sup>3</sup> Daily spreads, in percentage points, are calculated as the difference between the yield of the iBoxx index of euro-denominated guaranteed bank bonds and the two-year swap rate on euros.

Sources: Dealogic; Markit.

<sup>57</sup> BIS (2009) provides a number of indicators showing that “risk tolerance” in financial markets increased significantly starting from mid-March 2009.

*Size, maturity and currency.* The average size of the bonds issued over the reference period differed significantly across countries, mainly reflecting the investor class at which bonds were targeted: average size was very large in Germany (€3.4 billion), and between €1.1 billion and €2.3 billion in France, Belgium, the Netherlands and the United States. It was below €1 billion in the other countries, with Australian and Irish banks opting for small issuance size, below €300 million (Table 3.1).

The average maturity at launch ranged from below two years in Ireland and Denmark to more than three years in the Netherlands, Austria and Australia (Table 3.1). Most bonds will expire in 2012 (more than €300 billion; Figure 3.2), suggesting that funding problems may well arise in that year.

While 14 different currencies of denomination were used, 40% (362) of guaranteed bonds are denominated in US dollars, reflecting the large issuance by US banks in domestic currency (Figure 3.1, left-hand panel). The euro is the denomination currency of 222 issues, sterling of 68 and the Australian dollar of 54, while a minor role is also played by other currencies. Most banks have, in addition, issued bonds in currencies other than the domestic one.

Table 3.1  
**Characteristics of guaranteed bond issuance  
in individual countries<sup>1</sup>**

Country	Total issuance (euro bn) <sup>2</sup>	No of issuers	No of bonds issued	Average size of each bond (euro bn) <sup>2</sup>	Average maturity at issuance (months)
Australia	60.8	14	202	0.3	42
Austria	15.6	4	16	1.0	35
Belgium	2.0	1	1	2.0	18
Denmark	11.9	23	97	0.1	18
France	84.7	2	37	2.3	28
Germany	109.3	9	32	3.4	16
Ireland	17.5	7	55	0.3	19
Luxembourg	0.8	1	3	0.3	16
Netherlands	41.6	5	30	1.4	45
New Zealand	1.8	5	7	0.3	39
Portugal	4.4	5	5	0.9	37
Spain	26.3	23	40	0.7	30
Sweden	17.9	4	66	0.3	32
United Kingdom	113.0	10	134	0.8	29
United States	192.5	40	168	1.1	32

<sup>1</sup> All data refer to the period October 2008–May 2009. <sup>2</sup> Amounts were converted into euros at the exchange rate of the day of issuance.

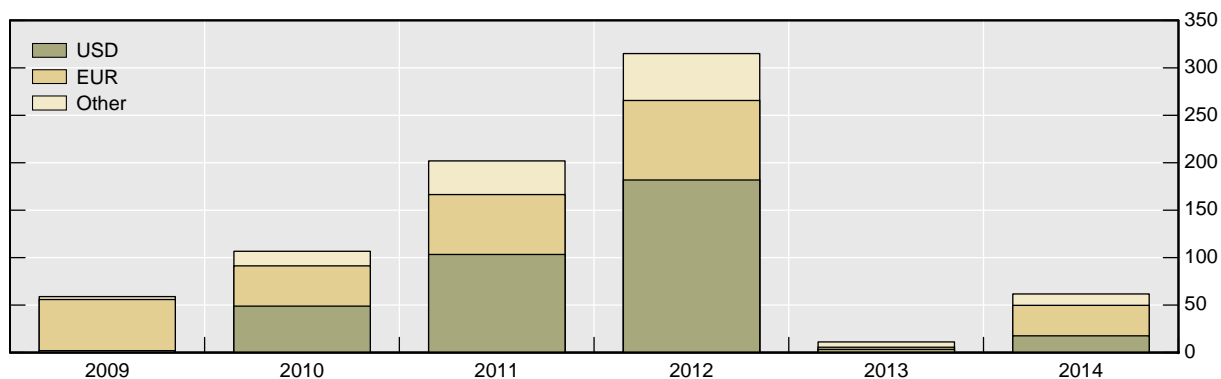
Source: Dealogic.

*Number of bonds/issuers.* Between October 2008 and May 2009, around 900 guaranteed bonds were issued, totalling about €700 billion. Table 3.1 shows that Australia was the country with the highest number of bond issues (202), followed by the United States (168) and the United Kingdom (134).

Since the start of the schemes, 140 eligible issuers have benefited from the state guarantee. The bulk of banks and financial institutions are from the United States (40 issuers), followed by Denmark and Spain (23). Also in Australia (14), the United Kingdom (10) and Germany (9), several banks took advantage of this type of government guarantee. Out of 140 issuers, around two thirds (91) issued more than once.

Figure 3.2

### Redemptions of guaranteed bonds by year<sup>1</sup>



<sup>1</sup> Amounts outstanding, in billions of euro equivalents, of guaranteed bank bonds maturing between 2009 and 2014; as of 31 May 2009. Amounts converted into euros using the exchange rate of the day of issuance.

Source: Dealogic.

## 3.2 Did guarantees help banks to refinance?

The main goal of the schemes providing explicit government guarantees on bank bonds was to help banks maintain access to medium-term funding at reasonable cost, offsetting the drying-up of alternative sources of funding and the increase in credit spreads. Hence, in order to assess the success of the guarantees, one should ask two separate questions. First, did guaranteed issuance come at the expense of (ie crowd out) non-guaranteed issuance (eg unsecured and covered bonds)? Second, has total (ie the sum of guaranteed and non-guaranteed) issuance increased, either because guaranteed issuance has offset a decline in non-guaranteed issuance or because it has provided indirect support to non-guaranteed bonds by reducing banks' funding liquidity risk (ie the risk that the bank cannot roll over its debt)?

As for the first question, the degree of substitution between guaranteed and non-guaranteed bank debt seems to differ across regions (see Figure 3.3 and Table 3.2).<sup>58</sup> In the euro area, there seems to have been no substitution between the two classes of securities, as issuance of both has been broadly synchronised. Some crowding-out seems to have taken place in the United Kingdom, where the decline in non-guaranteed issuance, especially between January and April 2009, has been associated with substantial issues of guaranteed bonds.

<sup>58</sup> Figure 3.3 and Table 3.2 show gross bank issuance of guaranteed, unsecured and covered bonds in the euro area, the United States and the United Kingdom since October 2008. Two caveats apply to the data: (i) in the period considered, the dollar has fluctuated in a range of 1.24 to 1.46 against the euro (a 15% dollar depreciation), possibly distorting the comparison (data are in euro equivalents) over time and across regions; and (ii) commercial paper (CP) represented an additional source of fixed income funding for banks in the three regions. However, given the stark difference in maturity (commercial paper typically has one-week maturity in the United States and a few weeks in the euro area, while the maturity of bank bonds is around two to three years), we examine bonds separately from CP.

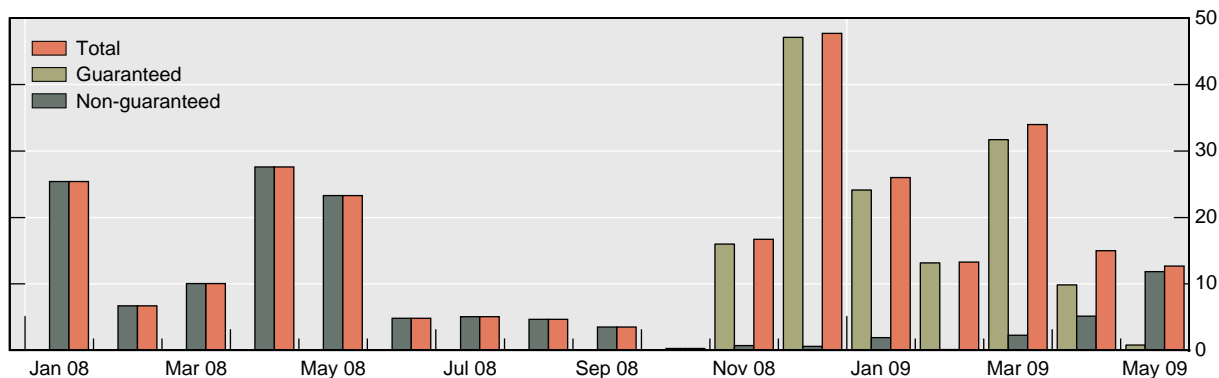


This negative correlation broke down in May, when an increase was observed for both asset classes. The US programme may have made crowding-out effects more likely, as guarantees apply to all new issuance unless the bank decides to opt out. However, issuance of unsecured debt by US banks was extremely weak from June 2008, well before the start of the programme. It is therefore unlikely that guaranteed bonds were issued at the expense of non-guaranteed bonds.

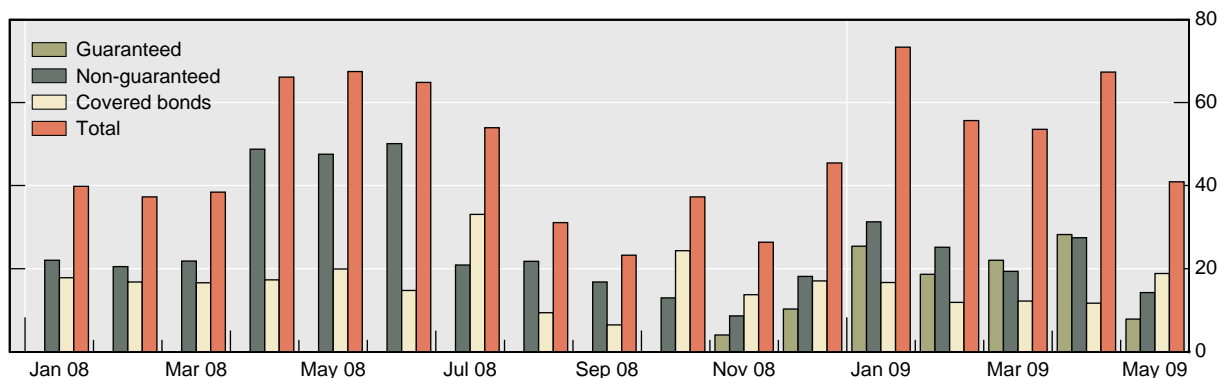
Figure 3.3

**Gross issuance of bank bonds<sup>1</sup>**  
Monthly data, in billions of euro equivalents

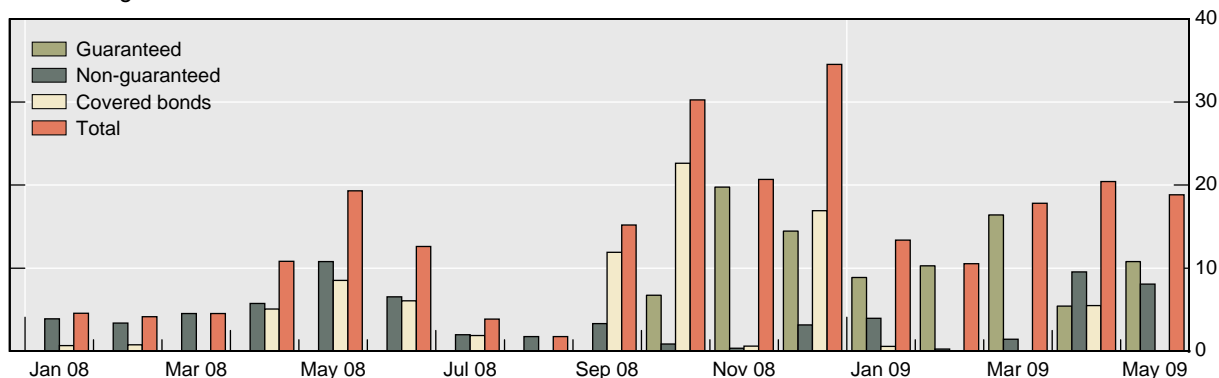
United States



Euro area



United Kingdom



<sup>1</sup> Cutoff date: 31 May 2009. Amounts converted into euros using the exchange rate of the day of issuance.

Source: Dealogic.

As for the second question, namely whether total bond issuance has increased, the data suggest that overall issuance increased in all three economic regions (Table 3.2). The

increase was pronounced in the United Kingdom, where total issuance in Q4 2008 and Q1 2009 was, respectively, three and five times larger than one year earlier. In the United States, total issuance in the same two quarters was one and a half times larger than one year earlier. Finally, for the euro area, the figure in Q4 2008 was roughly unchanged from a year earlier but in Q1 2009 roughly one and a half times larger than in Q1 2008.

Table 3.2

**Gross issuance of bank bonds:  
euro area, United States and United Kingdom<sup>1</sup>**

Quarterly data, in billions of euro equivalents; cutoff date: 31 May 2009

	Euro area				United States				United Kingdom			
	Guar- anteed	Non- guaranteed <sup>1</sup>	Covered	Total	Guar- anteed	Non- guaranteed <sup>1</sup>	Covered	Total	Guar- anteed	Non- guaranteed <sup>1</sup>	Covered	Total
2007	0	506	211	717	0	289	9	298	0	132	17	149
2008	14	310	207	532	63	113	0	176	41	46	75	162
2007 Q1	0	212	60	271	0	100	4	104	0	48	5	53
Q2	0	166	57	223	0	91	5	96	0	58	8	65
Q3	0	63	39	102	0	59	0	59	0	14	2	16
Q4	0	65	56	122	0	39	0	39	0	12	2	15
2008 Q1	0	64	51	116	0	42	0	42	0	12	1	13
Q2	0	146	52	199	0	56	0	56	0	23	20	43
Q3	0	59	49	108	0	13	0	13	0	7	14	21
Q4	14	40	55	109	63	2	0	65	41	4	40	85
2009 Q1	66	76	41	183	69	4	0	73	36	6	1	42
Q2	37	53	37	127	14	23	0	37	16	20	5	41

<sup>1</sup> Non-guaranteed bonds include medium-term notes (MTNs) but not ABS and MBS. Amounts were converted into euros using the exchange rate of the day of issuance.

Source: Dealogic.

*Crowding-out of covered bonds.* Assessing whether guaranteed bonds have crowded out covered bonds is no easy task. Figure 3.3, centre and bottom panels, and Table 3.2 show that in Q1 2009 covered bond issuance in the euro area and the United Kingdom was contained relative to the previous year (US issuance of covered bonds was equal to zero). However, in most countries securities backed by real estate assets experienced difficulties well before rescue measures were launched. Hence, it is unclear whether this effect is really a consequence of competition from guaranteed issuance. In any case, the announcement in early May 2009 that the ECB would purchase €60 billion of covered bonds has had a favourable market impact, inducing an increase in issuance from €11 billion to 19 billion (Figure 3.3, centre panel) and a decline in yields.

Information on the yields on the two asset classes suggests that evidence of crowding-out effects differs across countries. In countries such as Germany, which has the largest market for covered bonds, the yield on covered bonds remains more attractive than that on guaranteed bank bonds for both issuers and investors, due to the wedge represented by the guarantee fees: in May the swap spread on a basket of covered bonds was equal to about 75 basis points, while in the previous months the spread at launch on guaranteed bonds issued by German banks had on average been close to 25 basis points (see Figure 3.4). From the point of view of German investors, covered bonds clearly provide a much higher return than guaranteed bonds (although risk may also be somewhat higher). Furthermore, the issuing bank is likely to prefer covered bonds, once the guarantee fees it pays to the government are added to the spreads of guaranteed bonds: for instance, considering that German banks paid a fixed fee of 50 basis points plus the median five-year CDS spread over the reference period – which for most German banks is equal to about 45 basis points – the

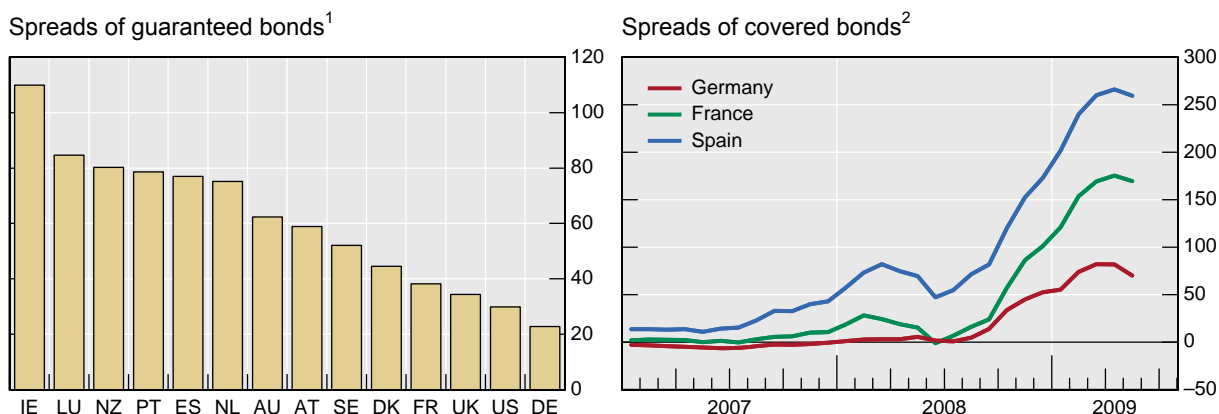
total cost of guaranteed bonds becomes 120 basis points over swap. Of this, only 25 basis points are pocketed by investors.

In other EU countries with large covered bond markets, such as France and Spain, some crowding-out may have taken place insofar as guaranteed bonds are a cheaper source of funding than covered bonds for issuers (but less attractive for investors, who can obtain higher yields on covered bonds).<sup>59</sup>

Figure 3.4

### Spreads of guaranteed and covered bonds

In basis points



AT = Austria; AU = Australia; DE = Germany; DK = Denmark; ES = Spain; FR = France; GB = United Kingdom; IE = Ireland; LU = Luxembourg; NZ = New Zealand; NL = Netherlands; PT = Portugal; SE = Sweden; US = United States.

<sup>1</sup> Spreads over swap rates at launch. Simple averages for 441 bonds issued over the period October 2008–May 2009. <sup>2</sup> Spreads over swap rates; monthly averages of daily data for the period January 2007–May 2009. Differences between the yield of iBoxx country indices of covered bonds and four-year swap rates on euros.

Sources: Bloomberg; Datastream; Markit.

### 3.3 Which countries and banks have been most active in issuing guaranteed bonds?

A few countries account for most of the issuance of guaranteed bonds. The United States leads (Figure 3.5), partly due to the fact that guarantees are provided on all bonds unless the bank opts out. Robust issuance has also been recorded in the United Kingdom, France, Germany and Australia. Another group of countries (the Netherlands, Spain, Ireland, Sweden, Denmark and Austria) issued smaller amounts, in a range of €20–40 billion. Issuance was smaller in the remaining countries.<sup>60</sup>

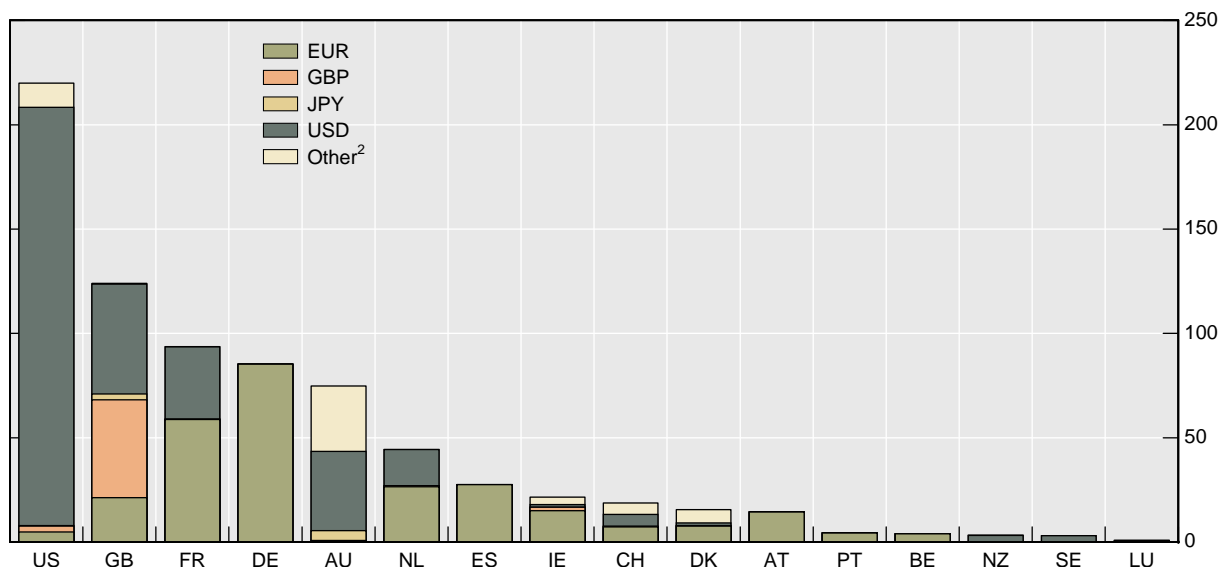
<sup>59</sup> In Spain, the swap spread on covered bonds was equal to 260 basis points; the spread on guaranteed bank bonds was on average 80 basis points and, assuming an overall guarantee fee of 100–120 basis points, the total cost of issuing guaranteed bonds turns out to be 180–200 basis points. In France, the swap spread on covered bonds was equal to 170 basis points; in contrast, the guarantee fee charged by the SFEF agency (see Chapter 2) was lower than in other EU countries (the sum of a fixed component of 20 basis points plus an average CDS spread component of 40 basis points) and the average swap spread of SFEF-guaranteed bonds was below 30 basis points, bringing the overall cost of guaranteed issuance to around 90 basis points.

<sup>60</sup> For a comparison of take-up rates across countries, see Chapter 1.

The issuing policy differs across intermediaries. A first group of intermediaries – including Lloyds Banking Group and Barclays – used guaranteed and non-guaranteed bonds as complementary financing tools.<sup>61</sup> Other intermediaries (eg the two largest Italian banks and Rabobank) seem instead to consider the two asset classes as alternative sources of funding and chose to tap only the non-guaranteed market (see Figure 3.6).

Figure 3.5

**Guaranteed issuance by country and by currency<sup>1</sup>**



AT = Austria; AU = Australia; BE = Belgium; CH = Switzerland; DE = Germany; DK = Denmark; ES = Spain; FR = France; GB = United Kingdom; IE = Ireland; LU = Luxembourg; NL = Netherlands; NZ = New Zealand; PT = Portugal; SE = Sweden; US = United States.

<sup>1</sup> Gross amounts issued over the period October 2008–May 2009, converted into euros using the exchange rate of the day of issuance; in billions of euro equivalents. <sup>2</sup> Mainly the Australian dollar, the New Zealand dollar and the Danish krone.

Source: Dealogic.

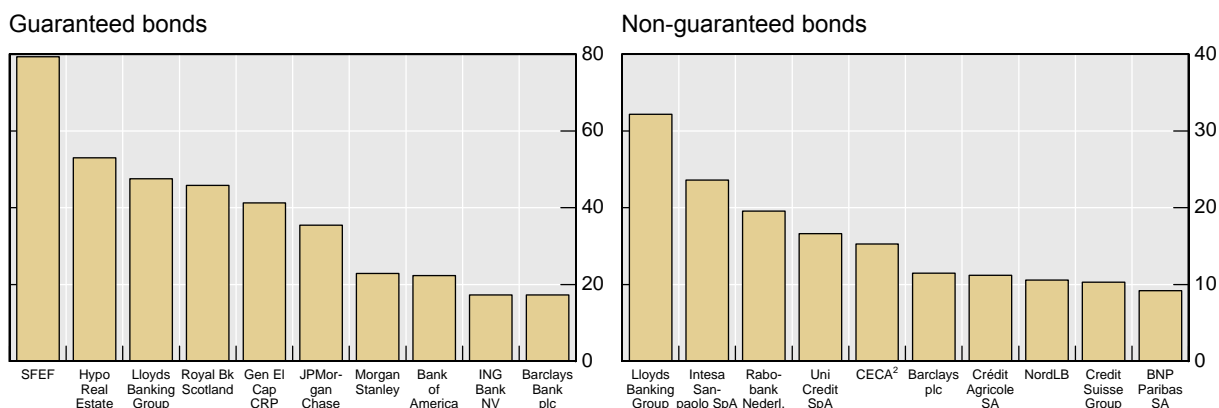
Another gauge of banks' reliance on guarantees is the rollover ratio (ie the bank's issuance of guaranteed bonds as a proportion of its matured debt). Although differences exist across countries, a common principle of the rescue measures is that the guarantees are granted to help banks roll over maturing bonds. Data show that rollover ratios differ significantly across banks and countries. For some 50 banks with bonds maturing over the period October 2008–May 2009, the median ratio was 150%. At the country level (see Figure 3.7), the ratio was equal to or below 100% in Germany, the United States and France. The ratio reached 850% in the United Kingdom and 700% in Australia.

<sup>61</sup> Other intermediaries may have followed similar strategies indirectly. For example, the Spanish Confederation of Savings Banks (Confederación Española de Cajas de Ahorros SA) may have issued non-guaranteed bonds on behalf of savings banks that issued guaranteed bonds. Crédit Agricole may also have issued guaranteed bonds under the aegis of SFEF.

Figure 3.6

**Ten largest issuers of guaranteed and non-guaranteed bonds<sup>1</sup>**

In billions of euros



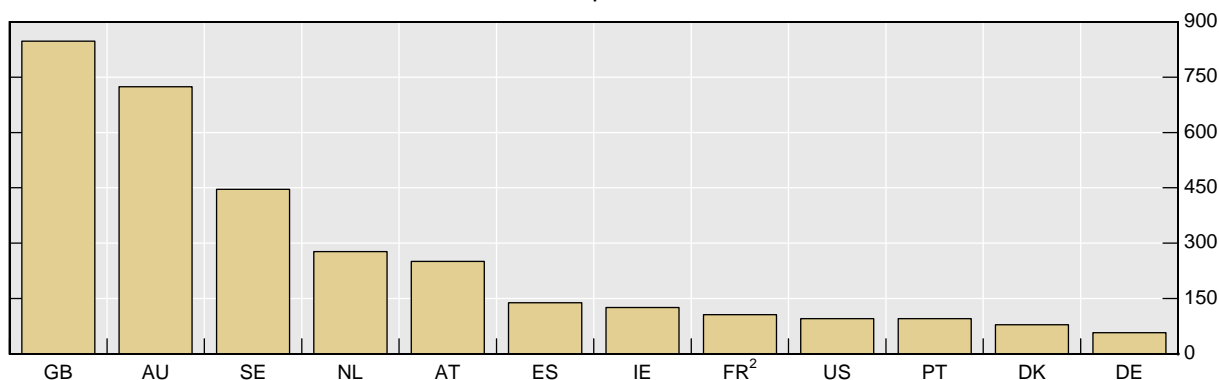
<sup>1</sup> Amount of bonds issued by each bank over the period October 2008–May 2009, converted into euros using the exchange rate of the day of issuance. <sup>2</sup> Confederación Española de Cajas de Ahorros SA.

Source: Dealogic.

Figure 3.7

**Rollover ratios of individual banks: country medians<sup>1</sup>**

In per cent



AT = Austria; AU = Australia; DE = Germany; DK = Denmark; ES = Spain; FR = France; GB = United Kingdom; IE = Ireland; NL = Netherlands; PT = Portugal; SE = Sweden; US = United States.

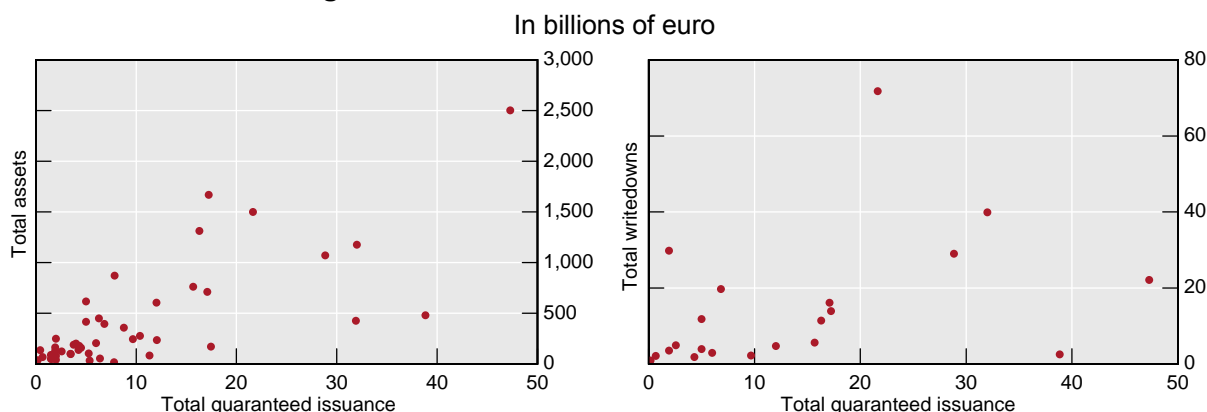
<sup>1</sup> The rollover ratio is the ratio of guaranteed issuance to non-guaranteed matured debt over the period October 2008–May 2009, for 45 banks with bonds maturing over the period. <sup>2</sup> Dexia Credit Local.

Source: Dealogic.

The banks that were most active in issuing guaranteed bonds (in terms of sheer size) are larger than average (see Figure 3.8, left-hand panel) and have a high volume of writedowns (although for this variable the relation is weaker; see Figure 3.8, right-hand panel).

Figure 3.8

**Issuance of guaranteed bonds, bank assets and bank writedowns<sup>1</sup>**



<sup>1</sup> Issuance of guaranteed bonds was calculated for 47 banks over the period October 2008–May 2009. Writedowns for 21 banks (right-hand panel) over the period October 2008–May 2009 were taken from Bloomberg. Total assets (left-hand panel) for these banks refer to the end of 2007, converted into euros at market exchange rates.

Sources: Bloomberg; Dealogic.

The fact that large banks have issued large amounts of guaranteed bonds is not surprising. These banks have registered large volumes of writedowns, which in turn provide strong incentives to rely on guarantees in order to avoid the high spreads they should otherwise pay on unsecured debt. In contrast, the amount and the intensity of guaranteed issuance are not correlated with bank liquidity (proxied with the ratio of deposits to total liabilities) and capitalisation (measured with core capital ratio).

Although these findings are not surprising, they may raise concerns on the efficiency effects of the programmes, which de facto subsidise large and complex financial institutions, that according to some commentators were at the root of the ongoing crisis<sup>62</sup> and may be less likely to use the funds raised to increase lending to the real economy.<sup>63</sup>

### 3.4 The investor base

Market analysts and international organisations provide information, mostly survey-based, about the investor base of guaranteed bonds in the euro area. Two results seem particularly relevant. First, a large portion of guaranteed bonds (much higher than for non-guaranteed bank bonds) is bought by domestic investors (eg German bonds are mostly purchased by German investors). Second, banks are the main investors in guaranteed bonds, with a higher share than in the case of non-guaranteed bonds.<sup>64</sup>

These facts may signal further inefficiencies induced by the rescue measures. Foremost is the fact that guarantees seem to be part of the process of partial re-segmentation of the euro area bond market, previously one of the sectors in which the integration fostered by the launch of the euro had been highest. Moreover, the dominant role of banks among investors

<sup>62</sup> For example, Wolf (2009) argues that “We are painfully learning that the world’s mega-banks are too complex to manage, too big to fail and too hard to restructure”; see also Partnoy (2009). For an in-depth analysis of the (weak) relationship between M&As, size and efficiency in the banking sector, see Pilloff and Santomero (1998), Amel et al (2004) and Ferguson et al (2007).

<sup>63</sup> See, for example, Roubini and Richardson (2009).

<sup>64</sup> See ECB (2009), Deutsche Bank (2009) and *The Wall Street Journal* (2009).

implies that these bonds de facto subtract resources from the interbank market and do not stimulate bank lending to the real economy, but just lending to other banks.

Problems may also arise from the fact that guaranteed bonds are purchased by investors seeking exposure to sovereign risk, as opposed to corporate credit risk, and with a longer time horizon than unsecured debt investors. Although in the short term the fact that sovereign risk investors have “stepped in” may have reduced crowding-out effects, the problem remains that investors who used to purchase unsecured bonds, which carry corporate credit risk, may have become accustomed (or even addicted) to investing in low-risk guaranteed bank bonds, which instead imply exposure to sovereign (or quasi-sovereign) risk. In the medium term, after guarantees are removed, it may not be easy to revert to normal conditions, where investors monitor banks and price bonds according to the characteristics of the issuer. In other words, unless banks return quickly to soundness, convincing the “credit risk seeker” investor base to resume investing in unsecured debt may turn out to be an expensive task, with potential adverse consequences for the real economy.

### **3.5 Factors affecting demand and supply of guaranteed bonds**

#### **3.5.1 Pricing of state guarantees**

All governments providing guarantees on bank liabilities charge a fee for the insurance. However, the criteria followed to set the fees in the United States and Europe differ on two grounds (see also Chapter 1).

The first difference is represented by the mechanism for determining the fee. While the US authorities charge a flat fee, which depends only on the maturity of the bond, in Europe the cost of the guarantee is also based on each bank’s CDS spread over a given time window.<sup>65</sup> The European market-based fee represents, at least to some extent, a tax levied on banks according to risk (guarantors are likely to break even, and may even profit). In contrast, the US flat-fee system has been characterised as a subsidised system, in which the government and “strong” banks subsidise “weak” banks.<sup>66</sup>

The second important difference between the US and the European pricing scheme has to do with optionality of participation. In the United States, all financial institutions participate in the programme unless they opt out. And if they do not opt out, then all their senior unsecured liabilities will be insured by the FDIC. In contrast, in Europe participation is optional at the level of each single bond issue. This difference clearly affects the take-up rate of the guarantees. Moreover, it will probably influence the medium-term ability of the banks to stop relying on government support: in a way, the European system will probably lead to what economists call a “separating outcome”, as the mechanism may reveal to markets which intermediaries are “stronger” and which are “weaker”, allowing banks to raise debt and equity accordingly. In contrast, the US opt-out system is more likely to lead to a “pooling outcome”, in which institutions are very likely to ask for guarantees, preventing markets from discriminating among them on the basis of credit risk. According to some commentators, the

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<sup>65</sup> In more detail: in the United States, the current rate for FDIC-insured depository institutions for maturities of one year or more is a flat fee of 100 basis points. In contrast, the United Kingdom and euro area countries follow the ECB guideline, which recommends, in the case of a bond with maturity over one year, a flat fee of 50 basis points augmented by each bank’s median five-year CDS spread observed over a specified time window (January 2007–August 2008). Australia, which is the third largest issuer of guaranteed bonds after the United States and the United Kingdom, slightly differs in that it applies a rating-related fee (which goes from 70 basis points for a AAA rating to 150 basis points for a BBB-rated or unrated bank).

<sup>66</sup> See, for example, Acharya and Sundaram (2008).

“separating outcome” is more likely to ensure that lending markets will continue to function in an orderly way once the guarantees are removed.<sup>67</sup>

### 3.5.2 *Timeliness of payments*

The timeliness of payments in case of default is a key determinant of the spreads investors require on guaranteed bonds. At least two different approaches have been followed by countries on how to honour the guarantee in case a bank is unable to make payments on interest or principal. The French authorities have devised a prepayment structure by setting up an agency (SFEF) which issues the bonds on behalf of individual institutions. Under this system, banks wanting to receive proceeds from SFEF have to provide collateral. In order to ensure the timeliness of payments, the participating banks receive a collateral call at least 13 days prior to a payment date. The participating bank has to transfer the required amount to SFEF at least three days before the payment date, otherwise SFEF will ask the government to activate the guarantee and the government will cover any shortage in one day. Hence, the funds needed to service the bond will be available at least two days before the payment date.

All the remaining countries follow a different approach, which provides for the guarantor to step in, upon request, only after the issuer has failed to pay on the due date.<sup>68</sup> Australia, Germany, Ireland and the United Kingdom provide details on the procedures in case of default and explicitly refer to a grace period before the guarantee becomes effective. Australia and Ireland commit to the shorter grace periods, whereas Germany and the Netherlands commit to longer periods (see Table 3.3). Other countries do not provide details.

Table 3.3  
**Timeliness of payments**  
In days

<b>Grace periods for bonds</b>		
<b>Country</b>	<b>Grace period for interest payment</b>	<b>Grace period for principal payment</b>
Austria	5–30	5–30
Australia	10	10
Germany	30	30
Ireland	14–15	7
Netherlands	14–30	7–30
Portugal	10–14	10–14
Sweden	10–30	10–15
United Kingdom	14–30	7–14

Source: RBS (2009).

<sup>67</sup> See Acharya and Sundaram (2008). These authors acknowledge that their assessment is predicated on a “benign scenario” about the evolution of the financial crisis. Should the crisis deepen further (a “pessimistic scenario”), the “separating outcome” could push some weak banks into bankruptcy, resulting in a higher burden for taxpayers.

<sup>68</sup> See RBS (2009).



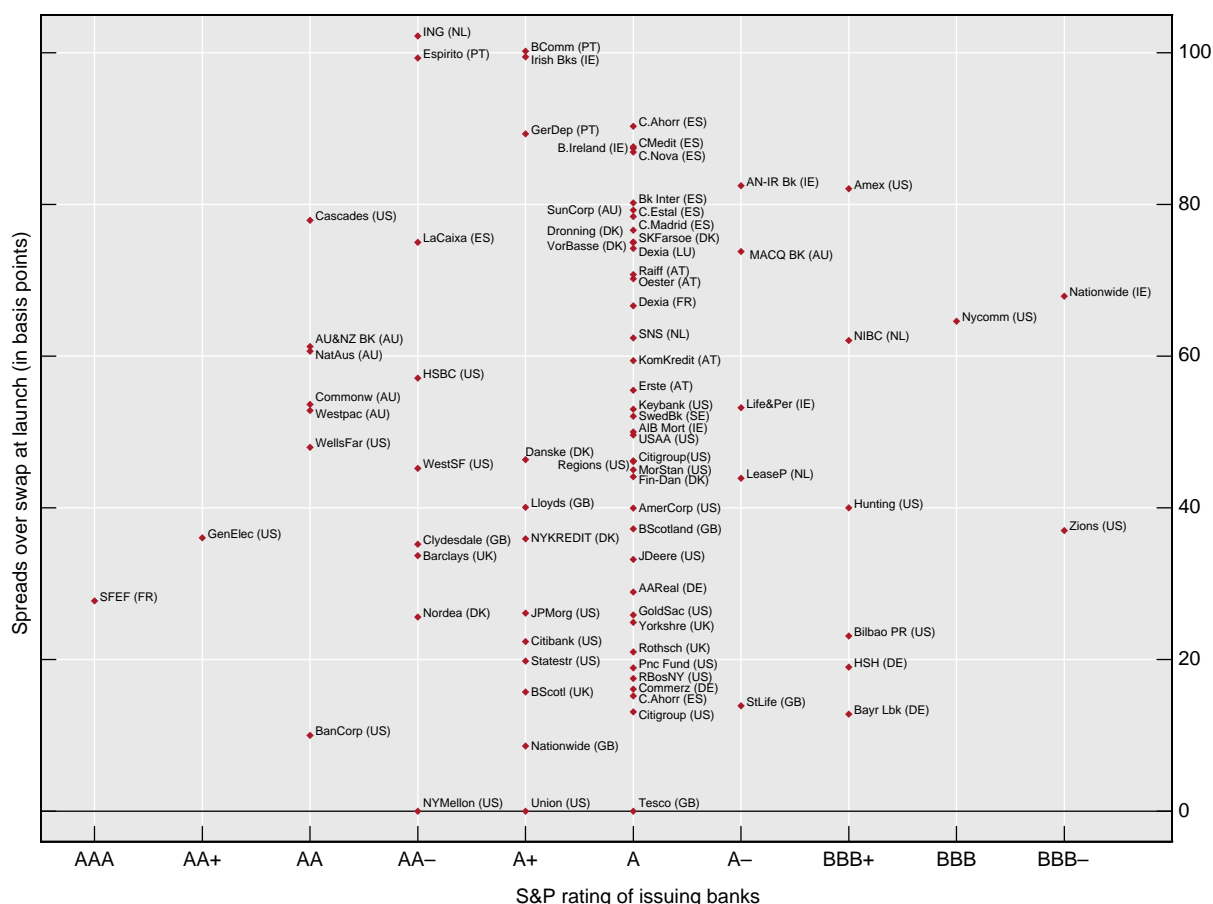
### 3.6 What explains the “tiering” of spreads at launch?

#### 3.6.1 Cross-country evidence

A striking feature of guaranteed bonds is the significant tiering of spreads at issuance paid by banks. Two issues emerge. First, the spreads at launch are not monotonically related to ratings. In some cases, banks with better ratings pay larger spreads than weaker banks from other countries. Figure 3.9 shows how wide the range of spreads can be. For example, for bonds issued by banks rated A, the range is close to 80 basis points (from 20 points for some US banks to 100 points for Spanish banks).

Figure 3.9

Dispersion of spreads at launch on guaranteed bonds<sup>1</sup>



<sup>1</sup> Includes guaranteed bonds issued in the period October 2008–May 2009.

Sources: Bloomberg; Dealogic.

Second, the spreads closely reflect the nationality of the issuing banks. For instance, Portuguese banks (Banco Commercial Português, Caixa Geral de Depósitos (both rated A+) and Banco Espírito Santo (rated AA-)) paid a much higher spread at launch (90–100 basis points over the swap rate) than German banks such as Commerzbank (rated A), Bayerische Landesbank and HSH Nordbank AG (both rated BBB+), which paid less than 20 basis points. In fact, the guaranteed bonds issued by the Portuguese banks were rated AA, whereas the rating of the bonds issued by German banks was AAA. These numbers may explain why Banco Bilbao (rated AA) chose to issue guaranteed bonds in the United States and not in Spain, relying on its Puerto Rico branch (rated BBB+) and paying a spread of only 23 basis points.

The country differences between the spreads at launch can be very large (see Figure 3.4, left-hand panel). The countries with the smallest spreads are Germany (25 basis points) and the United States (32 basis points),<sup>69</sup> while the most expensive issues are those by banks in Portugal (96 basis points), Ireland (86) and Spain (81).

These characteristics of the data are likely to cause inefficiencies and distortions. For example, Table 3.4 – which reports the spreads paid by the banks which have issued both guaranteed and non-guaranteed bonds<sup>70</sup> – shows that many of the banks that were required to pay the highest spreads on non-guaranteed debt are also in the group of banks which were able to issue guaranteed bonds at the lowest cost.<sup>71</sup> For instance, Commerzbank paid 210 basis points over the swap rate for non-guaranteed bonds but only 16 basis points for guaranteed bonds. For Barclays, the difference between the two spreads is even larger (around 400 basis points).<sup>72</sup>

Table 3.4  
**Spread at launch for the banks which issued  
 both guaranteed and non-guaranteed debt<sup>1</sup>**

Top 12 banks with the cheapest guaranteed borrowing			Top 12 banks with the most expensive non-guaranteed borrowing		
Bank	spread over swap	rating	Bank	spread over swap	rating
1 COMMERZBANK AG	16	A	1 BARCLAYS BANK PLC	435	AA–
2 NORDEA BANK A/S	26	AA–	2 BANCO ESPIRITO SANTO	300	A
3 GOLDMAN SACHS GROUP	26	A	3 BANCO COMMERC PORTUG	295	A+
4 JPMORGAN CHASE & CO	26	A+	4 BANK OF IRELAND	238	A
5 AAREAL BANK AG	29	A	5 JPMORGAN CHASE & CO	218	A+
6 JOHN DEERE CAPITAL CORP	33	A	6 GOLDMAN SACHS GROUP INC	215	A
7 BARCLAYS BANK PLC	34	AA–	7 COMMERZBANK AG	210	A
8 GENERAL ELEC CAP CORP	36	AA+	8 CITIGROUP INC	208	A
9 ROYAL BK SCOTLND	37	A+	9 BANK OF AMERICA CORP	205	A
10 BANK OF AMERICA CORP	40	A	10 LLOYDS TSB BANK	200	A+
11 LLOYDS TSB BANK	40	A+	11 NORDEA BANK A/S	178	AA–
12 CITIGROUP INC	46	A	12 ROYAL BK SCOTLND	153	A+

<sup>1</sup> Considering the 25 banks which issued both guaranteed and non guaranteed bonds, the left-hand column of the table ranks the banks which paid the lowest rates on guaranteed debt while the right-hand column ranks the banks with the highest rates on non-guaranteed debt. For each bank, the spreads over swap are the simple average of all bonds issued over the period October 2008–May 2009. The shaded area shows those banks that appear in both columns.

Source: Dealogic.

### 3.6.2 An empirical analysis of the determinants of the spreads

The dispersion of the spreads at launch paid on guaranteed bonds may reflect several factors. First, it may reflect the characteristics of the issuer, such as its rating or its legal form (ie bank vs non-bank). Second, it may reflect the characteristics of the bonds issued, such as the volume issued (a proxy of liquidity) or the maturity. Finally, the spreads may reflect the

<sup>69</sup> However, if we considered as French government-guaranteed only the issuance carried out by SFEF, then the average spread at launch would drop to 28 basis points.

<sup>70</sup> Over the period October 2008–May 2009, there were 25 banks from eight countries which issued both types of debt.

<sup>71</sup> The shaded area shows those banks that appear in both columns.

<sup>72</sup> Note, however, that in order to have access to the state guarantees, banks in Germany, Spain and the United Kingdom pay an average fee of around 90–120 basis points.

characteristics of the guarantor, such as its rating or the mechanisms it would follow in case of default of the issuer (ie the time needed to obtain the refund). In order to distinguish among these factors, we run the following cross-sectional regressions on 363 guaranteed bonds issued in the period October 2008–March 2009 and for which data on the spread at launch are available:

$$spread = \alpha_0 + \sum \alpha_j D_j^{BANK} + \sum \alpha_k D_k^{ISSUE} + \sum \alpha_i D_i^{GOV} + \sum \alpha_z D_z^{MKT} + \varepsilon$$

where  $D_j^{BANK}$  are dummies that characterise the issuer,  $D_k^{ISSUE}$  are dummies representing the characteristics of the bonds, are  $D_i^{GOV}$  dummies of the features of the guarantor and  $D_z^{MKT}$  are market condition dummies. Table 3.5 reports the exogenous variables considered in the regressions and their breakdown into dummies.

Table 3.5  
Breakdown of exogenous variables<sup>1</sup>

Variable	Dummies	Breakdown
Issuance volume	3	Low, medium, high
Maturity	3	Low, medium, high
Currency of denomination	3	Euro, US dollar, other currencies
Rating of bond issue	2	AAA, not AAA
Issuer rating	4	BBB, A, AA, AAA
Issuer sector	2	Bank, non-bank financial institution
Issuer CDS spread	3	Low, medium, high
Bond issuer frequency	2	Once, more than once
Sovereign rating	2	AAA, not AAA
Size of bond guarantees pledged by government	2	Low, high
Total resources committed by government to all rescue packages (ratio to GDP)	3	Low, medium, high
Timeliness of payments in case of default	4	SFEF, fast, medium, slow
Market conditions	6	Oct 08, Nov 08, Dec 08, Jan 09, Feb 09, Mar 09

<sup>1</sup> For continuous variables, we created three dummies: a dummy equal to 1 if the observation is in the first quartile; a dummy equal to 1 for the fourth quartile; and a dummy equal to 1 for the second/third quartile. For non-continuous variables, the dummy determination was judgmental and reflected the possible values of each variable. For instance, sovereign guarantees were broken down into two categories: one for ratings equal to AAA, and one for ratings below AAA.

Table 3.6 presents the results of a first regression in which the spread is the function of all potentially relevant variables.<sup>73</sup> It is worth noting the signs of the significant coefficients. As far as country characteristics are concerned, as expected, a sovereign rating of AAA favours

<sup>73</sup> The first column is for the whole sample, the second for the one restricted to multiple issuers only.

a reduction of the spread at launch. A large amount of funds pledged by the government for guaranteeing bond issuance by banks also reduces the initial spread.

Table 3.6

**Regression coefficients on selected characteristics**

Dependent variable: SPREAD AT LAUNCH		
Method: least squares		
Variable	Whole sample	Multiple issuers
<b>Constant</b>	80.7057***	62.3479***
<b>Rating Govt AAA</b>	-42.3553***	-46.4372***
<b>Commitment LOW</b>	-15.6179***	-13.2807***
<b>Bond scheme HIGH</b>	-14.3264***	-11.3500**
<b>Maturity LOW</b>	-10.7367***	-12.8515***
<b>Volume HIGH</b>	0.2427	1.5825
<b>Currency other than USD</b>	-6.1839*	-8.5680**
<b>Low issuance rating</b>	-4.1507	-2.8498
<b>Single issuance</b>	-5.5491	
<b>Rating issuer A</b>	-7.0366	6.6467
<b>Rating issuer AA</b>	-5.8947	6.3218
<b>Rating issuer AAA</b>	-4.8753	9.0894
<b>Issuer is a bank</b>	8.8772*	16.9396***
<b>CDS HIGH</b>	6.5157*	9.7554*
<b>November</b>	16.4228	11.2259
<b>December</b>	43.1846***	40.1024**
<b>January</b>	22.4322	19.5935
<b>February</b>	22.3998	17.3485
<b>March</b>	19.0193	16.1179
<b>Poor timeliness</b>	17.6725**	27.5776***
<i>R-squared</i>	0.33	0.33
<i>Included observations</i>	363	321

\*, \*\* and \*\*\* asterisks denote statistical significance at 90%, 95% and 99%, respectively.

At the same time, a significant share of GDP devoted to the overall rescue packages increases the spread; a possible interpretation is that it signals a systemic weakness of the financial system of that country or, in extreme cases, even adverse implications for the public sector deriving from the (very large) commitment. A timely repayment in case of default is associated with a lower spread, as expected. As regards the characteristics of the issue, longer maturities pay larger spreads as do US dollar-denominated bonds (possibly because of the supply effects related to the very large volume of issues in the US currency). The characteristics of the issuer suggest that riskier banks (ie banks with large CDS premia) pay more at launch: this might reflect the fact that a default would inevitably imply a loss for the bondholders (eg because of the administrative costs they would bear in order to get the funds back), so that the rating of the issuer is not irrelevant even in the presence of a guarantee by the government.<sup>74</sup>

<sup>74</sup> Another explanation is that investors do not really consider governments to be riskless.

In a second regression which considers only the subsample of banks that issued more than once, we focus on the statistically significant variables (we run the regression in a way that all coefficients have negative signs).<sup>75</sup> The results, shown in Table 3.7, confirm the previous ones.

Table 3.7  
Regression results

Dependent variable: SPREAD AT LAUNCH				
Method: least squares				
Variable	Coefficient	Std error	t-statistic	Prob
<b>Constant</b>	159.1136	12.1088	13.1403	0.0000
<b>Rating Govt AAA</b>	-36.9772	9.1617	-4.0361	0.0001
<b>Commitment LOW</b>	-16.4248	4.1067	-3.9995	0.0001
<b>Bond scheme HIGH</b>	-10.3880	4.9677	-2.0911	0.0373
<b>Maturity LOW</b>	-11.6171	3.6802	-3.1567	0.0018
<b>Currency other than USD</b>	-9.0035	3.5845	-2.5118	0.0125
<b>CDS LOW</b>	-10.7583	4.7596	-2.2604	0.0245
<b>High timeliness</b>	-24.2639	6.5120	-3.7260	0.0002
<b>Issuer is a financial institution</b>	-16.5356	5.4804	-3.0172	0.0028
<b>Favourable market conditions</b>	-22.7889	3.6373	-6.2653	0.0000
<i>R-squared</i>	0.326			
<i>Included observations</i>	321			

A graphical representation of these results is reported in Figure 3.10. The height of the bar is the intercept of the regression (159 basis points), which, by construction, represents the estimated spread of the weakest issuer, ie the spread which a hypothetical bank would pay at launch in the worst case scenario: ie if the guarantor were rated below AAA, if the government's resources committed to all rescue packages with respect to GDP were relatively high, if the sheer amount of money pledged to the guaranteed scheme were relatively low, if the maturity of the bond were three years or longer, if the bond were denominated in dollars, if the issuer were a bank and had a high CDS, if repayment in case of default were slow, and if the issuance took place under adverse market conditions.

The layers of the bar in Figure 3.10 show the contribution of each variable used in the regression to the spread (represented by the coefficients in Table 3.7). Each layer can be seen as the estimated saving an issuer would achieve if one of the "worst case" characteristics foreseen by the intercept were removed.

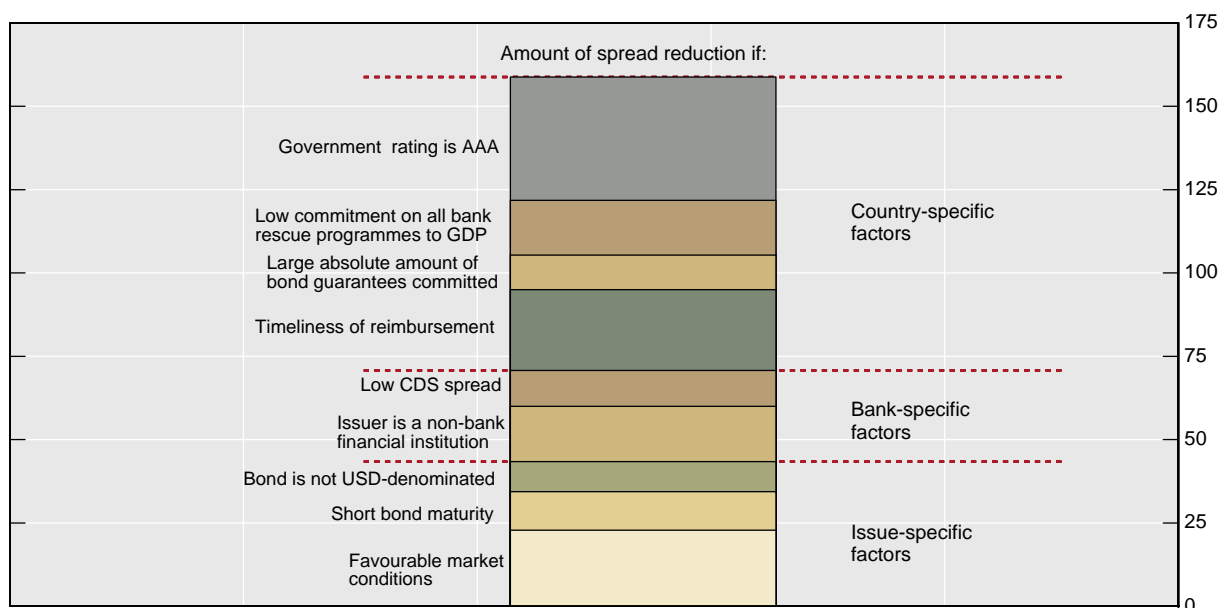
The main insight emerging from our results is that the largest component of the spread reflects the characteristics of the guarantor, and not those of the issuer. The rating of the state, the ratio to GDP of the resources committed by the government for all rescue plans, and the sheer resources pledged in the bond scheme add up to 64 basis points (40% of the whole possible spread reduction). If we also add the "practicalities" of the reimbursement scheme (ie the timeliness of payments in case of default), the value increases to 88 basis

<sup>75</sup> In this way, our estimate of the constant (159 basis points) represents the spread paid by the hypothetical weakest issuer and each coefficient of the regression measures the potential reduction of the spread. This result is obtained by using the dummies in such a way that the value 1 is associated with a lower spread. For instance, the coefficient of the first explanatory variable ("Rating Govt AAA", equal to 36.98) is the spread reduction (in basis points) if the guarantor is rated AAA.

points (56%). The characteristics of the issuer instead contribute less than 30 basis points. In particular, banks with a good CDS may reduce the initial spread by around 11 basis points. As for the issue-specific factors, their combined contribution to the cost of the bond issuance is equal to approximately 45 basis points: an issuer could reduce the spread by 21 basis points by issuing the bond in currencies other than US dollar and by choosing shorter maturities; and he/she could save a further 25 basis points by issuing the bond under favourable market conditions.<sup>76</sup>

Figure 3.10

**Breakdown of a hypothetical bond spread by contributing factors<sup>1</sup>**



<sup>1</sup> Results are derived from a regression analysis on 321 issues. The bar shows how much of the estimated spread can be attributed to country-specific, bank-specific and issue-specific factors.

One consequence of this finding (ie the major role of the guarantor in determining the spread on guaranteed bonds) is that several banks with “weak” sovereign backing have preferred not to issue guaranteed bonds. For instance, the choice of Italian banks to issue non-guaranteed bonds instead of guaranteed ones may be in part related to the relative costs of the two liability classes. In late April, the Italian bank Unicredit issued €1 billion of non-guaranteed bonds with a maturity of three years. The spread over swap paid at launch was 190 points. If instead it had issued guaranteed bonds, it can be estimated that the overall cost of issuing the bonds (fee and spread) would have been higher, in a range of 210–234 basis points.<sup>77</sup>

<sup>76</sup> As an aside, note that the value of the intercept is about the same as the sum of all the coefficients (158 basis points). This would indicate that an issuer could in principle, under ideal conditions, engineer the issue so as to pay a spread over the swap rate close to zero.

<sup>77</sup> This number has been estimated by adding up four components: (i) the spread at launch (which can be estimated in a range between 66 and 90 basis points); (ii) the fixed component of the guarantee fee, equal to 50 basis points; (iii) the variable component of the fee, namely the median CDS spread over the relevant period (44 basis points in the case of Unicredit); and (iv) the 50 basis points add-on fee required by the Italian Treasury in the case of bonds with a maturity of two years or longer. The first of the above four components is estimated by making use of the regression coefficients.

In contrast, banks with a strong guarantor behind them (such as those in the United States or Germany) are in a position to issue guaranteed bonds at a much smaller spread and are likely to find it cheaper to issue guaranteed bonds. The preference for non-guaranteed bonds expressed by some of these banks is probably related to non-price factors, such as stigma and, more importantly, conditionality (ie behavioural constraints in lending and in management's compensation and hiring).

By way of an example, on 16 April JPMorgan issued a \$3 billion 10-year bond at 350 basis points above the Treasury yield (which was roughly similar to the 10-year dollar swap rate). It would have been cheaper to issue a guaranteed bond (with a necessarily shorter maturity, of up to three years) paying a 40–50 basis point spread and a 100 basis point fee. Most likely, the bank opted out of the guarantee programme in order to signal its good health and avoid conditionality on its lending and governance.

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## **4. The effects of the rescue measures on lending supply: a preliminary look**

All the measures presented in the previous chapters are meant to strengthen financial intermediaries, with the ultimate goal of supporting the supply of credit to the private sector. However, the size and timing of the impact of such measures may vary considerably depending on whether financial intermediaries decide to use public funds to strengthen their balance sheets or to support lending. In this chapter, after a brief description of the programmes aimed at providing direct support to selected credit markets, we review the recent trends in aggregate bank lending. We then provide some very preliminary and qualitative evidence of the effects of the rescue measures on the lending behaviour of individual institutions in the United States.

The assessment of the effects of rescue measures on bank lending is rendered particularly difficult by several factors, which call for special caution: (i) it is too early to judge the effects of the measures (only a few quarters have elapsed since last autumn), all the more if one considers the possibly very long lags before support measures translate into a change in lending behaviour on the part of banks; (ii) in recent months, lending behaviour may have been affected by other factors that may have confounding effects, such as the adoption of large-scale non-conventional monetary policies and, more recently, signals of improvement in general economic conditions, which have coincided with rescue measures; and (iii) lending standards applied by banks reflect a number of different characteristics, some of which are hard to measure, with others that have not yet emerged either because of lags (typically, losses) or because they are contingent on regulatory and macroeconomic developments.

### **4.1 Measures for improving the supply of credit to ultimate borrowers**

Besides adopting the measures examined in previous chapters, the authorities of a number of countries have engaged in direct interventions in selected markets in order to sustain the flow of credit to the real economy. Many of these programmes have featured the central bank as the buyer (or financier of the purchases). This involvement of central banks is known as “credit easing” (as opposed to “quantitative easing”, which is based on the expansion of bank reserves). Credit easing implies that the central bank takes more credit risk or term risk onto its balance sheet. The rationale behind this policy option is twofold (see Bernanke (2009)): (i) concerns about capital, asset quality and credit risk may limit banks’ willingness to extend credit, notwithstanding the access of these firms to central bank liquidity; and (ii) there may be a need to directly address instability or declining credit availability in critical non-bank markets (such as the CP market or the market for ABS), which may insufficiently benefit from the expansion of bank reserves.

The table in the annex to this chapter provides an overview of the measures announced since September 2008 in a sample of industrial economies. A number of measures target mortgage or housing-related credit markets (eg in Australia, Canada, Spain and the United States). The US Term Asset-Backed Securities Loan Facility (TALF) is aimed at reviving the securitisation market for consumer credit. Other facilities, which purchase CP or corporate bonds, support corporate financing in general. All these facilities tend to accept only high-quality assets and are thus different in nature from measures that deal with distressed or “toxic” assets. A case in point is the ECB’s outright purchases of covered bonds, which allow banks to better manage the maturity mismatch between their assets and liabilities while preserving banks’ incentives for prudent credit risk evaluation and monitoring and limiting the Eurosystem’s exposure to credit risk (see Trichet (2009)).

Where the eligible sellers are the issuers of the targeted securities, the direct financing motive is evident. Where the eligible sellers are holders of the targeted securities, the immediate impact lies more in liquefying the sellers’ asset portfolio.



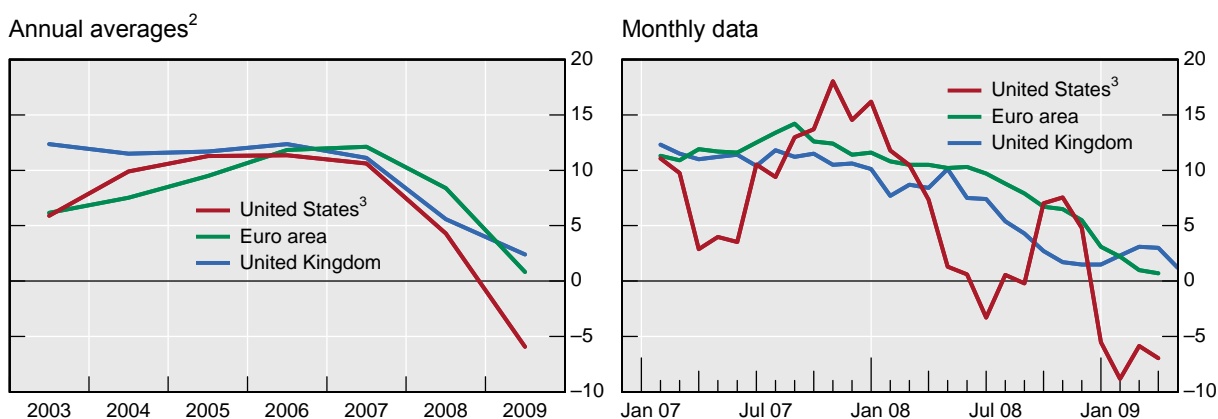
## 4.2 Recent trends in bank lending

After several years of robust growth, in 2008 bank lending to firms and households significantly decelerated both in the United States and in the main European countries (see Figure 4.1). In early 2009, quarterly annualised growth rates were on average barely positive in Europe and outright negative in the United States.<sup>78</sup>

Figure 4.1

### Bank lending to the private sector<sup>1</sup>

Quarterly growth rates, in per cent



<sup>1</sup> Annualised and seasonally adjusted three-month growth rates. For the United States, 13-week growth rates; for the euro area and the United Kingdom, growth rates are adjusted for the effects of securitisation. <sup>2</sup> For 2009, first four months only. <sup>3</sup> For October and December 2008 data are adjusted for reclassifications of existing loans of former non-bank institutions (see Troshkin (2008)).

Sources: ECB; Bank of England; Federal Reserve Board.

In a downturn, a pronounced deceleration in bank lending is hardly surprising, as it may reflect both demand and supply factors. On the one hand, it may be due to a reduction in banks' willingness to lend. On the other hand, it may reflect two other factors outside banks' control: a retrenchment in the demand for funds by borrowers and a deterioration in credit risk.<sup>79</sup>

Disentangling supply from demand effects is no easy task. One way of doing it is to look at loan pricing conditions. If the decline in lending growth is associated with a rise in credit spreads, then the case for a tightening of supply becomes stronger. Following the Lehman bankruptcy, spreads between loan rates and the funding rates widened considerably across the board until the beginning of 2009 (see Figure 4.2). Since then, they have declined somewhat in the United States and in the euro area while remaining broadly unchanged in the United Kingdom. Similar patterns have characterised corporate bond spreads.

However, the credit spreads have probably been influenced by many factors other than banks' willingness to lend.<sup>80</sup> First, the crisis has been characterised by an increase in the demand for safe assets that has reduced the yields on government bonds,<sup>81</sup> thus increasing

<sup>78</sup> The resilience of bank loans in the United States in the third quarter of 2008 has spurred a debate on the dependability of aggregate volumes of bank loans as indicators of risks of a credit crunch. See Chari et al (2008), Cohen-Cole et al (2009) and Contessi and Francis (2009).

<sup>79</sup> See, for instance, Berlin (2009).

<sup>80</sup> On this point, see, for example, Bank of England (2009), page 4, and Chari et al (2008).

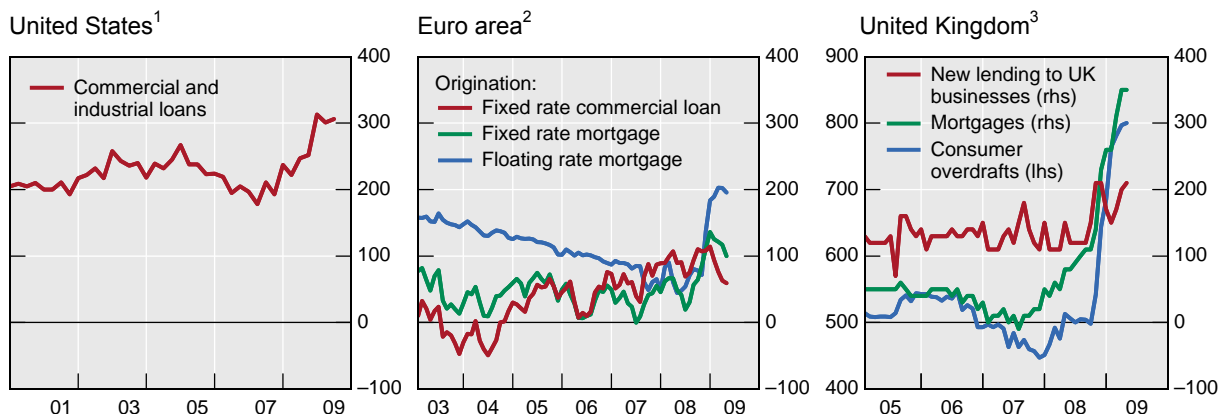
<sup>81</sup> For the United States on this issue, see Chari et al (2008).

spreads. Second, it is well known that credit risk is procyclical, as it tends to rise in downturns and fall in expansions.<sup>82</sup> These two factors imply that the rise in spreads seen in recent months does not necessarily imply a lower propensity to take risk on the part of banks.

Figure 4.2

### Interest rate spreads on bank loans

In basis points



<sup>1</sup> Spread of commercial and industrial loan rates over intended federal funds rate. <sup>2</sup> For fixed rate (floating rate) loans, spreads are computed over the 10-year swap rate (three-month Euribor rate). <sup>3</sup> Spreads over Bank rate.

Source: National data.

Another limitation of both volume and spread based indicators of credit conditions is that they ignore other factors that affect the availability of funding, such as loan fees and the maturity of the loan. Anecdotal evidence suggests that, in 2009, US banks have not only applied higher spreads but have also shortened the duration of credit lines to both corporate and credit card customers.<sup>83</sup>

Another way of distinguishing between supply and demand effects is provided by bank lending surveys. These surveys track changes in the standards and terms of banks' lending policies and the state of business and household demand for loans. In both the United States and Europe, since the inception of the crisis credit standard indicators have consistently indicated a tightening in banks' lending policies (see Figure 4.3).<sup>84</sup> According to loan officers, this prolonged restriction in bank lending has reflected the deteriorating economic environment (at the macro level as well as at the industry or firm specific level), the high levels of funding costs and lower tolerance for risk.

This global tightening trend seems to have peaked in the last quarter of 2008. Since then, indicators of lending standards have slightly declined. Nevertheless, the net balance of banks reporting tightening has remained positive on both sides of the Atlantic (with the notable exception of the corporate loans sector in the United Kingdom, where banks have recently reported a slight net easing). For the euro area, there are indications that banks have tightened credit standards via non price terms too, eg via reductions in the amount of loans and credit lines extended to firms or in the loan-to-value ratio for mortgages.

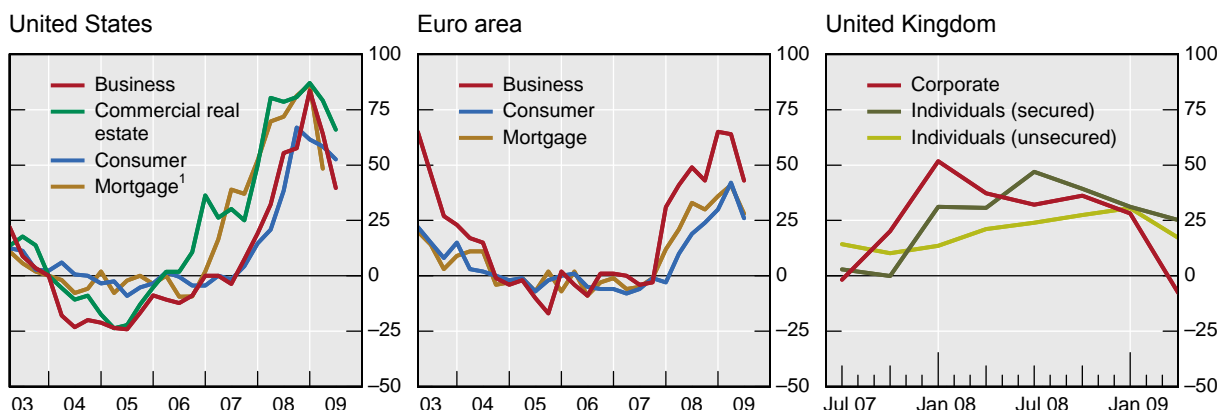
<sup>82</sup> See, for example, Collin-Dufresne et al (2001).

<sup>83</sup> See Ng (2009).

<sup>84</sup> In the United States, credit standard indicators for real estate lending started to edge upwards earlier than mid-2007.

Figure 4.3

**Indices of tightening of credit standards**  
 Net percentage of banks reporting tightening standards



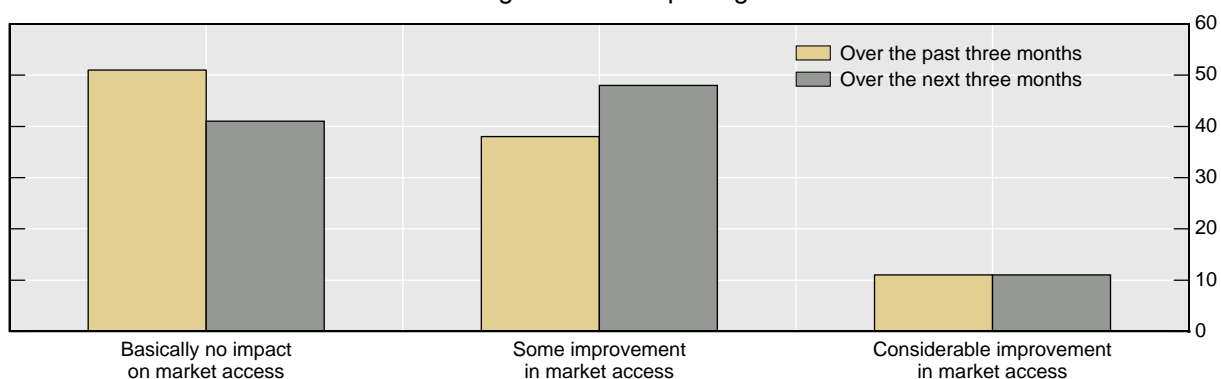
<sup>1</sup> From Q2 2007, simple average of prime, subprime and non-traditional mortgage loans.

Source: National data.

The most recent rounds of the bank lending survey for the euro area contained ad hoc questions on the impact of the turmoil on banks' lending supply.<sup>85</sup> In the survey relating to the first quarter of 2009 and to expectations for the second quarter, banks reported that government announcements of capital injections and debt guarantees had had a positive impact on their access to wholesale funding (see Figure 4.4). The percentage of banks reporting an improvement in the access to markets because of government plans increased from 34% in the previous quarter to around 50%. The percentage of banks expecting government rescue programmes to have a positive effect on wholesale funding conditions in the second quarter of 2009 rose to around 60%.

Figure 4.4

**Banks in the euro area: expected effect at end-Q1 2009  
 of government rescue measures on banks' access to wholesale funding<sup>1</sup>**  
 Percentage of banks reporting an effect



<sup>1</sup> Distribution of estimated effects of government announcement of recapitalisation support and guarantee of debt securities issued by banks on banks' access to wholesale funding.

Source: ECB (2009).

<sup>85</sup> See ECB (2009).

All in all, the latest survey information seems to suggest that the tightening of credit standards has reduced somewhat in the most recent weeks, after the implementation of the government rescue measures. This finding is insufficient, however, to establish causal relationships between these two phenomena. Moreover, at this stage it is premature to conclude that the recent improvement in lending standards represents a turning point in the credit supply cycle. In fact, bank lending conditions continue to be tight.

### 4.3 A preliminary look at bank-level data

Deeper insights into the impact of rescue measures on bank lending would require analysis of bank level data. By looking at single institutions, it is possible to assess, for example, to what extent loan growth rates differ between banks that had access to government support and others that did not. In this subsection, we take a very preliminary look at individual bank data focusing on the US banking system, for which detailed up-to-date information on individual banks is available.

For the banks that have received public equity injections through the Capital Purchase Program (CPP), useful indications may be drawn from the monthly lending report published by the US Treasury. Available data for the three month period February–April 2009 allow a detailed picture to be obtained of the distribution of lending activity across these banks (CPP recipients). Total loans of CPP recipients declined by 0.8% in March 2009 and 0.7% in April 2009. Individual data reveal quite a large deal of variability, though. Figure 4.5 shows the distribution of the growth rates of loans in March 2009 for the US banks that are CPP recipients, depending on size (proxied by their volume of lending in February). The data suggest that the reduction in lending by these US banks can be attributed to the intermediaries with the largest volume of loans: the growth rate is positive (around 0.6% on average) for banks up to the seventh decile and becomes negative for the three deciles that include the largest lenders (this heterogeneity in lending across size groups is confirmed by data on consumer and commercial loans). Data for April (not shown) indicate that, for the largest deciles, the average monthly growth rates of loans increased somewhat, mitigating the cross sectional dispersion by size. It is worth noting that the biggest lenders turn out to be also those that have received most of the capital injections. This evidence, of course, needs to be confirmed by further data in order to ensure that it does not reflect short-run movements only.

Bank level data also allow a comparison of loan growth rates between banks that have received government support and others that have not. It is, however, too early to carry out such an analysis, given the very short period of time that has elapsed since the introduction of the rescue measures.<sup>86</sup>

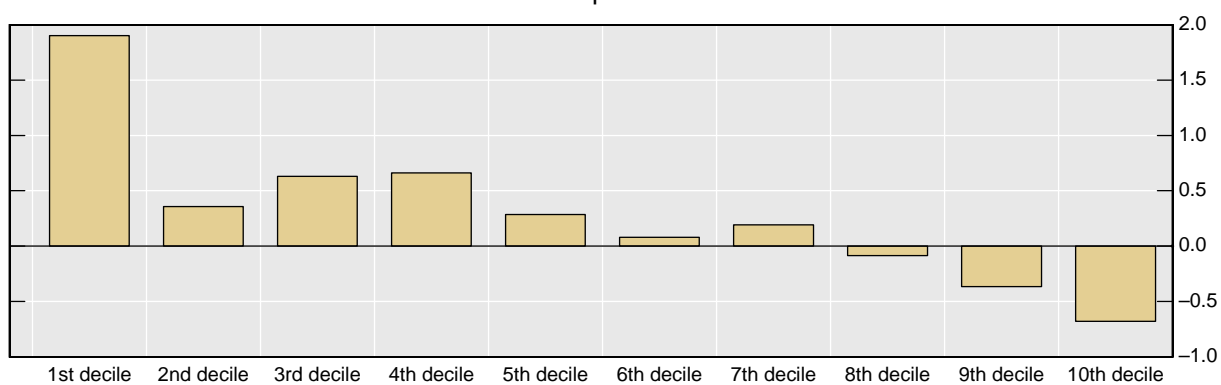
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<sup>86</sup> A different dataset that includes US-listed banks allows a rough comparison to be made between the loan growth rates of banks that have received government support and of the other banks. Available data suggest that, over the half-year including Q4 2008 and Q1 2009, the growth rate of total loans for banks that have received capital injections is in line with that of the other banks. In order to assess the effects of policy intervention, it would of course be necessary to have a longer sample period and to go beyond a mere comparison of average growth rates.

Figure 4.5

**US banks that have received capital injections: average growth rates of total loans in March 2009 by deciles of loans outstanding in February 2009<sup>1</sup>**

In per cent



<sup>1</sup> Growth rates are not annualised and are not adjusted for seasonality. The graph refers to US banks that have received capital injections under the Capital Purchase Program.

Source: Based on US Treasury data.

**Annex:**  
**Direct support programmes for borrowers and investors**  
**in key credit markets**

**Selected new measures announced since September 2008**

<b>Country</b>	<b>Facility (announcement date)</b>	<b>Buyer<sup>1</sup></b>	<b>Seller</b>	<b>Targeted asset(s)/ market(s)</b>
Australia	Purchase of RMBS (26 Sep 08)	AOFM (under Treasury)	RMBS issuers	RMBS
Canada	Purchase of RMBS (10 Oct 08)	CMHC (for government)	RMBS issuers	RMBS (CMHC-guaranteed)
Euro area	Repos conducted for longer maturities (up to one year, as announced on 07 May 09) and against a broader range of collateral (from 15 Oct 08)	ECB	Eurosystem's OMO counterparties	Via the banking system
	Purchase of covered bonds (07 May 09)	ECB	Eurosystem's OMO and investment counterparties	Euro-denominated covered bonds issued in the euro area
Japan	CP purchase (19 Dec 08)	Development Bank of Japan	Not specified	Commercial paper
	CP purchase (22 Jan 09)	Bank of Japan	BoJ OMO counterparties	Commercial paper <sup>2</sup>
	Corporate bond purchase (19 Feb 09)	Bank of Japan	BoJ OMO counterparties	Corporate bonds
Spain <sup>3</sup>	Financial Assets Acquisition Fund (10 Oct 08)	FAAF	Credit institutions	Covered bonds, ABS, MBS
United Kingdom	Asset Purchase Facility (19 Jan 09)	Bank of England Asset Purchase Facility Fund	CP: dealers and investors; corporate bonds: BoE OMO counterparties	CP, corporate bonds (non-complex) and other assets
United States	GSE MBS purchase (07 Sep 08)	US Treasury, via asset managers	Market	MBS (GSE-guaranteed)
	Commercial Paper Funding Facility (CPFF 07 Oct 08)	A Fed-financed SPV (CPFF Llc)	Eligible CP issuers	Commercial paper <sup>4</sup>
	Purchase of agency debt and agency MBS (25 Nov 08)	Federal Reserve <sup>5</sup>	Primary dealers	Mortgages and MBS (GSE-related)
	Term Asset-Backed Securities Loan Facility (TALF, 25 Nov 08)	Federal Reserve (lender)	US companies owning eligible collateral	ABS backed by consumer credit and other credits

<sup>1</sup> AOFM = Australian Office of Financial Management; CMHC = Canada Mortgage and Housing Corporation; FAAF = Fondo para la Adquisición de Activos Financieros. <sup>2</sup> Also some ABCP provided that it fulfils certain criteria. <sup>3</sup> See also euro area. <sup>4</sup> Three-month unsecured CP and ABCP. <sup>5</sup> Agency MBS is purchased via asset managers.

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