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Measurement and analysis of implicit guarantees for bank debt: OECD survey results

by
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Implicit guarantees of bank debt create economic costs and distortions, which is why policy makers have clearly announced their intention to rein in the value of implicit guarantees. This report identifies key findings from the responses from 35 countries to a survey on implicit guarantees. The survey shows that while authorities have not settled on the best way of measuring such guarantees, it is important to produce estimates of the value of these guarantees to facilitate the task of assessing progress in bank regulatory reform and in reducing the value of these guarantees. Whatever method is used, the value of implicit bank debt guarantees is substantial. In absolute terms, the estimated funding cost advantages can amount to about USD 10 billion on an annual basis for banking sectors in some jurisdictions and, in many cases, they are estimated to represent the equivalent of 1% of domestic GDP; in crisis situations, this value could rise to close to 3% of domestic GDP.

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EXECUTIVE SUMMARY

Background

The OECD's Committee on Financial Markets (CMF) recognised the potential relevance of implicit bank debt guarantees for the debt of financial institutions already in 2009 when discussing the policy response to the global financial crisis; the Committee noted back then that while the response might have been necessary, it was not costless, among other things more firmly entrenching the perception that bank debt is "special".

More recently, in 2012, the Committee agreed that the debt of many financial institutions benefits from perceived (implicit) bank debt guarantees and that this situation gives rise to a number of economic distortions, including competition and bank's risk-taking, while also potentially burdening the sovereign with contingent liabilities. The Committee concluded in 2012 that while the perception of implicit bank debt guarantees might reflect other more fundamental shortcomings for example in the overall regulatory and supervisory framework for banks, their persistence matters and that they create economic costs on their own.

Policy makers have clearly announced their intention to rein in the value of implicit bank debt guarantees. Against this background, the CMF decided to launch a survey process with the express intent to learn from each other how to measure the value of implicit bank debt guarantees and to analyse the determinants of their value as well as to formulate a policy response that takes into account the effect of bank regulatory and supervisory reform on the value of implicit bank debt guarantees, hopefully limiting it. A draft survey was discussed and the final version circulated in 2013. As of April 2014, responses were received from 33 OECD members and two key partners, implying a survey response rate of 97% among members. Given the concerns expressed that all OECD/CMF survey responses should not be seen as representing official views, the present report does not identify country-specific responses; it also refers to country-specific information only to the extent that the information is already in the public domain.

Key findings regarding measurement and analysis

Results regarding policy responses to the issue of implicit bank debt guarantees are covered in a companion report (forthcoming in *Financial Market Trends*). The present report places a sharp focus on the measurement and analysis of the value of implicit bank debt guarantees; it identifies the key findings from the responses to the OECD/CMF survey and the discussions of an earlier draft report of these findings:

- Government agencies, as a general rule, do not have *official* estimates of the value of implicit bank debt guarantees; they do not have official views on the value of such guarantees in particular as they generally do not intend to provide such guarantees and are reluctant to take steps that would further entrench the view that such guarantees exist.

- The issue of measuring such guarantees is complicated by the observation that the guarantees are only perceived to exist, even if they do matter in an economic sense, e.g. by reducing bank funding costs. The Committee agreed that authorities have not (yet) identified a single best way to measuring these guarantees.
- Where estimates of implicit guarantees are available, they often rely on credit rating data to estimate bank funding cost advantages, as did earlier estimates produced under the aegis of the CMF; but that observation does not imply that the approach is flawless. In fact, delegates suggested that the CMF should not aim at developing a single "CMF standard" for measuring the value of these guarantees, which by its existence could again provide more support to the existence of the guarantees. Also, there are costs of refining estimation methods that might outweigh the benefits at one point. Rather than search for an "ideal" method, the Committee's efforts would be better served by sticking to a reasonable estimation method such as discussed previously by the Committee, and examining the results obtained from that method periodically to assess progress in reducing the value of implicit bank debt guarantees. In this context, a suggestion was made for the Committee to serve as an international hub for the work on the measurement, analysis and policy response to implicit guarantees on bank debt.
- Despite the measurement difficulties, there was consensus that a reasonably robust measure of implicit bank debt guarantees is a key input to assessing the success of regulatory reform, including changes in resolution methods, in reducing the perception that banks are too-big, too interconnected or otherwise important to be allowed to fail. The survey responses revealed, however, that, so far, estimates are not available in several countries and where they are available they are produced at irregular intervals or on a one-off basis and typically not timely enough to assess the effect of more recent policy and regulatory measures.
- Where estimates are available, regardless of the specific method chosen, they suggest that the value of implicit bank debt guarantees remains substantial. Although estimates vary across countries, across banks and over time, the estimated funding cost advantage often ranges between 50 and 80 basis points and increases to well above 100 basis points during crisis situations.
- Where time series estimates are available for a specific country, they suggest that the value of implicit bank debt guarantees varies considerably over time. The combined empirical evidence suggests that estimated values peaked between 2009 and 2010 and that they have since declined, although not necessarily below the levels that could be observed prior to the global financial crisis.
- In absolute terms, the estimated funding cost advantage can amount to around USD 10 billion on an annual basis for banking sectors in some jurisdictions and, in many cases, they are estimated to represent the equivalent of 1% of domestic GDP; in crisis situations, this value can rise to close to 3% of domestic GDP.
- Not enough is known about the drivers of the changes in the value of implicit bank debt guarantees over time. The financial strength of the sovereign is an important determinant in addition to the "weakness" of the bank. The role of other bank-specific factors is somewhat less clear. Even so, survey respondents considered large size, interconnectedness and institutional complexity, as well as high leverage to be characteristics that tend to increase the value of implicit bank debt guarantees. Since estimates are not regularly updated, the effects of recent policy changes, most of which

were implemented since 2010 or are being currently implemented or considered, are typically not reflected in the estimates.

- The Committee agreed on the need for further analysis, especially as regards the extent to which the changes in the value of implicit guarantees reflect changes in bank and sovereign characteristics on the one hand and recent regulatory and resolution regime changes on the other.

I. Introduction and background

The present report presents selected key findings from the responses to the OECD/CMF survey on implicit bank debt guarantees as regards measurement and analysis of the value of implicit bank debt guarantees.

The report is part of the CMF efforts to improve efficiency and effectiveness of the regulatory approach in the financial sector and, in particular, to help re-introduce market discipline to limit excessive risk taking by banks. Unpaid guarantees are an invitation to use them and may encourage banks to take on more risk than they otherwise would and may lead their counterparties to rely on the perceived backstop of the guarantees rather than conducting their own due diligence and acting accordingly. Against the background of this observation and the recognition of the various other economic costs of implicit bank debt guarantees, policymakers have decided to rein in the value of these guarantees (for more detail see the companion report). To be able to assess progress in this regard they need a robust measure of the value.

The CMF, in October 2012, asked the Secretariat to prepare a survey on the measurement and analysis of implicit guarantees and the policy measures taken with a bearing on their value.[1] CMF members expressed their intent to learn from each other, not just as to how to best estimate and analyse the value of implicit bank debt guarantees, but also how to limit that value. A draft survey was presented by the Secretariat at the CMF meeting in April 2013 and the final version of the OECD/CMF survey was circulated in July 2013.

Responses were received from 33 OECD countries and two other countries (Russia and South Africa), which implies a survey response rate of 97% among OECD members, as of end-April 2014. Lead respondents were either the Treasury Departments (17), central banks (14), both Treasury and central bank (1), or financial services agencies (3). As a general rule, other authorities were consulted by the lead respondents, so that a typical consolidated response involved the Treasury and the central bank, as well as sometimes a financial services agency or a deposit insurer also.

At the outset, it should be noted that one key finding from the OECD/CMF survey responses is that government agencies, as a general rule, do not have official estimates of the value of implicit bank debt guarantees; they do not have official views on the value of such guarantees in particular as they do not intend to provide such guarantees and wish to avoid actions that might be interpreted as confirming the existence of such guarantees. That said, several agencies have either produced estimates of the value of implicit bank debt guarantees and/or are aware of credible estimates of such values, while others are planning to do so and/or would welcome developing further cross-country comparable estimates within the CMF.

Given the concerns expressed that all OECD/CMF survey responses should not be seen as representing official views, the present report does not identify individual country responses and provides country-specific information only to the extent that the information is already in the public domain.

The current report focuses on the measurement of implicit bank debt guarantees and the analysis of their determinants; the policy responses to the situation are covered in a companion report. The second section of this report provides some background regarding the issue of implicit bank debt guarantees, the third section describes some key findings from the OECD/CMF survey, and the fourth section concludes.

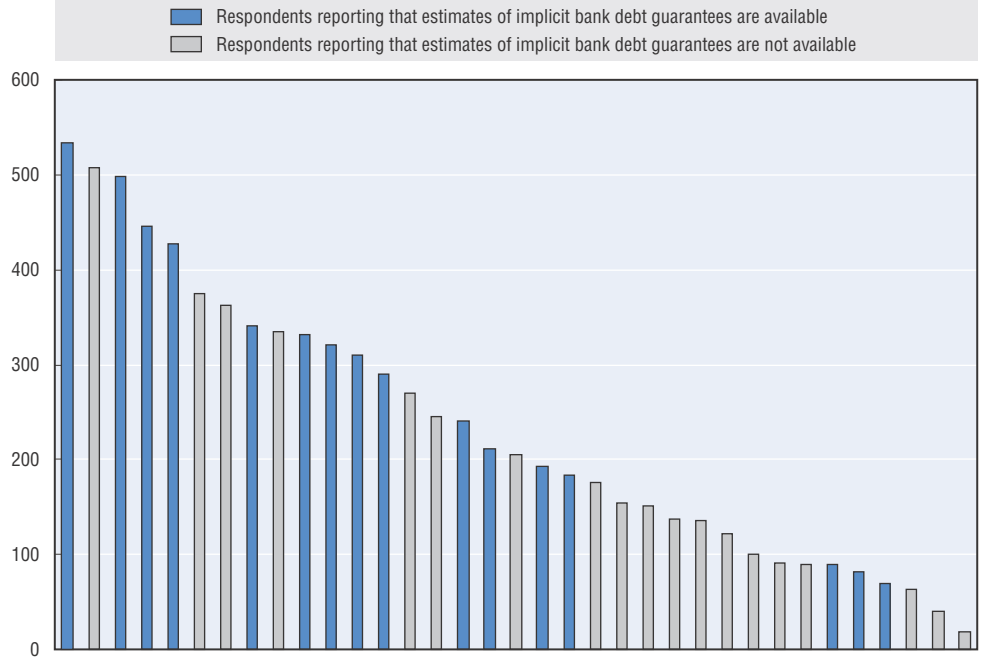
II. Estimating the value of implicit guarantees

Estimates are available in some but not all jurisdictions

The OECD/CMF survey asked whether authorities are aware of any credible empirical analysis estimating the value of implicit bank debt guarantees for banks in their own jurisdiction and whether they have undertaken efforts to quantify the value of perceived implicit bank debt guarantees. 43% of respondents are either aware of credible estimates of the value of implicit bank debt guarantees in their jurisdictions or have produced their own estimates. By contrast, 57% of responses indicated that no such estimates were available in their jurisdiction.

Thus, while a considerable number of authorities are aware of or have produced estimates of the quantitative importance of implicit bank debt guarantees in their jurisdiction, a larger number of authorities lack such estimates. Jurisdictions that are characterised by large banking sectors in terms of assets tended to be either aware of or have produced such estimates, with only a few exceptions. By contrast, respondents from jurisdictions with smaller banking sectors typically reported that they are unaware of existence of such estimates and have not taken steps to produce them directly (Figure 1).

Figure 1. **Availability of estimates of implicit bank debt guarantees**
(Each bar refers to one country/respondent)

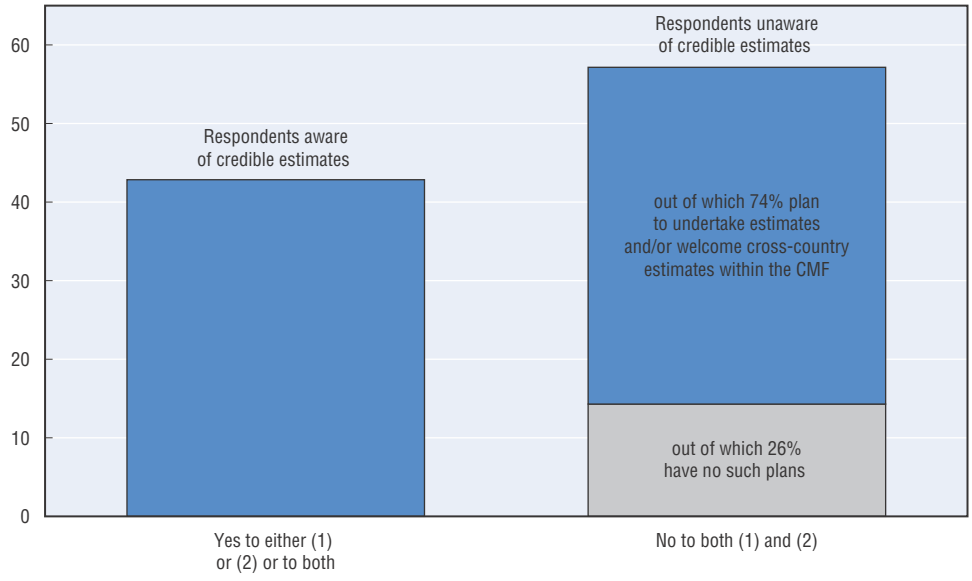


Note: Lengths of bars indicate the size of banking sector, measured by assets of the banking sector (as reported by the central bank or supervisory agency as of end-2012) as of domestic GDP, of the respondent country. In the case of three countries with considerable foreign participation, only domestic bank assets were considered.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

There are specific explanations in some cases as to why no estimates are available. For example, in the case of one respondent, where bond debt issuance by banks in the country is already very limited, most banks in the country belong to foreign groups. Hence, any implicit guarantee would not be provided by authorities from that country. In another country, there exists an *explicit* back stop facility for the banking sector with funds set aside in a fund earmarked for covering recapitalisation and resolution costs for the entire banking sector, thus making the notion of implicit bank debt guarantees less relevant.

Out of those responses indicating that no estimates were available in their own jurisdictions, 74% of respondents declared that they are, however, planning to produce such estimates and/or would welcome the CMF to coordinate efforts in producing cross-country comparable estimates (Figure 2).

Figure 2. **Availability of estimates of the value of implicit bank debt guarantees**



(1) Are you aware of any credible empirical analysis estimating the value of implicit debt guarantees for banks in your own jurisdiction?
(2) Have you undertaken efforts to quantify the value of perceived implicit bank debt guarantees? and if "No" to both questions (1) and (2).
(3) Are you planning to do so and/or welcome any coordinated estimation efforts within the CMF?

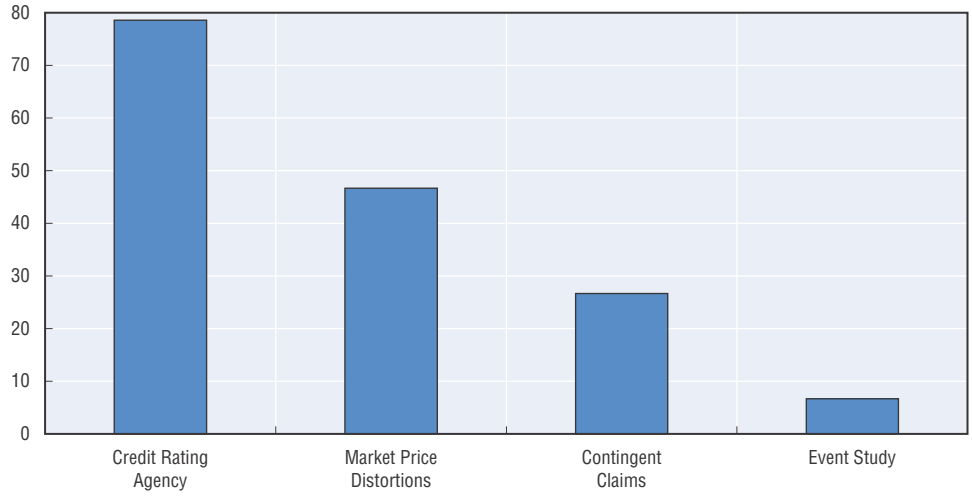
Note: Percentage of respondents on the y axis. Only respondents that answered "No" to both (1) and (2) were asked to answer question (3).
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

Where estimates are available, funding costs advantages are often estimated based on credit rating data

As regards estimation methods, a majority (78%) of the respondents that are aware of credible estimates or have produced such estimates has applied the funding cost advantage method, based on credit rating agency data (Figure 3). This method was considered the most straightforward to implement, benefitting from the simplicity of methodology and the easy availability of required data (see Box 1).

Respondents noted some shortcomings of alternative estimation methods. For example, basing estimates of funding costs advantages on *market price distortions* instead was considered rather difficult to implement especially in a cross-country context,

Figure 3. **What methods were used to measure implicit bank debt guarantees?**



Note: In per cent; number of countries as of total number of respondents for which estimates are available. Multiple answers allowed per respondent so that the total does not necessarily add up to 100. In addition, one respondent also noted that the funding cost advantage method was used, based on a combination of bank financial statements and market data on credit spreads at debt issuance.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

Box 1. **Overview of approaches to estimating the value of implicit bank debt guarantees**

Estimating the value of any debt guarantee is difficult as its value depends on future events that are difficult to foresee. In particular, the value of a guarantee depends on the probability of the guarantee being triggered and the extent of the shortfall between the amount guaranteed and the debtor's available own resources or any collateral, as well as on the strength of the guarantor. All these aspects depend in turn on numerous economic and financial developments that are difficult to predict.

This comment applies to both explicit and implicit guarantees. What is complicating matters in the case of the latter is that the support is only perceived. Thus, any estimate of the value of implicit guarantees involves an estimate of the willingness of the supposed guarantor to provide the guarantee.

Guarantees are similar in structure to options and therefore, **contingent claims models** have been used to value guarantees. In particular, using an option pricing framework, an estimated value of an implicit guarantee can be calculated as the expected annual payment required from the government to prevent a bank default, defined as bank equity falling short of debt. For example, an Oxera study (2011), commissioned by the Royal Bank of Scotland, applies this model directly to estimating the value of a guarantee for the UK banking sector and obtains substantially lower estimates than an earlier study by Haldane (2010). While conceptually attractive, one drawback of the contingent claims approach is that it requires one to make the assumption that government support will be provided with certainty once a specific threshold is reached.

Box 1. **Overview of approaches to estimating the value of implicit bank debt guarantees** *(cont.)*

An alternative approach is to focus directly on the observed distortions, which is the **funding cost advantage for banks**. One way to implement the funding cost advantage model is to use observed market prices of bank debt, henceforth referred to as the funding costs advantage model using market data. In particular, estimates of the effect of implicit guarantees can be obtained from observations of the yield spread differentials for debt securities that have similar characteristics but are issued by issuers that differ only in the extent to which they benefit from an implicit guarantee. This method allows one to measure more directly the effect of the implicit guarantee on funding costs.

Implementing the **funding cost advantage model using market data** faces important challenges, however. First, it can be quite challenging to identify securities that are comparable regarding their basic characteristics, given that important features (such as especially the term to maturity, coupon and other features such as currency) tend to differ from one bond to another. Second, a general issue when comparing yield spreads across different issues is that they are affected not only by credit risk perceptions but also by other factors such as liquidity and other premiums, which are difficult to separate out. Third, identifying a credit risk spread from observed market data requires one to identify an appropriate reference bond that is risk-free, which is becoming increasingly difficult in many markets.

An **alternative to using market data to implement the funding cost approach is to rely on data from credit rating agencies.** Based on the observation that funding costs and credit ratings are closely correlated, Rime (2005) considers the funding costs advantage model using credit rating data to obtain estimates of the value of implicit bank debt guarantees for Swiss banks. In fact, credit rating agency assessments of credit risks, at least in principle, provide a rather homogeneous measure of perceived credit risk, as the ratings are conceptually similar for banks wherever they are located and issue their debt. Schich and Lindh (2012), in a cross-country comparison, use data on the differences between a banks' "all-in" issuer credit rating (that is, including the effects of implicit support) and its intrinsic financial strength credit rating (abstracting from such support) for a sample of large international banks. That approach was applied with broadly similar results most recently by Bijlsma and Mocking (2013) and Schich, Bijlsma and Mocking (2014). While the approach is being more and more widely used, it relies on some specific assumptions, which are very carefully spelled out in a recent application of that method in European Commission (EC, 2014).

Event studies have focused on the effect of specific events on bank bond or equity returns to see whether returns increase as a result of them, assuming that such events make the implicit guarantees more or less valuable. Examples of such events are mergers and acquisitions (Penas and Unal, 2004), regulatory authority decisions suggesting that some banks are considered too-big-to-fail (O'Hara and Shaw, 1990), the bailout of banks (Pop and Pop, 2009) or their collapse (Warburton, Anginer and Acharya, 2013), or changes in sovereign credit ratings (Correa, Lee, Sapriza and Suarez 2012). Other studies focus on the size of the merger premium, which is expected to be higher to the extent that the merger increases the perception of an implicit guarantee (Brewer and Jagtiani, 2009). Bijlsma and Mocking (2013) provide a useful overview of the different approaches, explicitly distinguishing event studies from those of mergers and acquisitions.

Box 1. **Overview of approaches to estimating the value of implicit bank debt guarantees** *(cont.)*

Reflecting among other things the specific choice of estimation methods, periods and bank sample, results of empirical studies can vary widely, which is why it is useful to produce estimates considering different methods. Applying both funding cost advantage and contingent claims models, Noss and Sowerbutts (2012) reconcile the different estimates obtained by previous studies for the banking sector in the United Kingdom; their results also suggest that the estimates obtained from contingent claims analysis exhibit considerable sensitivity to small changes in parameter assumptions. More recently, the IMF (2014) used both approaches to produce alternative estimates, with the results from the funding costs advantages being broadly similar to those obtained in Cariboni et. al (2013) and EC (2014).

although several respondents had undertaken such efforts at the national level. Contingent claims analysis was considered as having some attractive features conceptually, but in practice has tended to yield estimates that are highly volatile and sometimes difficult to explain. One respondent reported the use of the event study methodology.[2] A drawback of this method, however, is that while it might be helpful in estimating the change in implicit guarantee due to a particular intervention, such as the policy response to the global financial crisis, it is likely to underestimate the total value of implicit bank debt guarantees in periods where markets are not stressed, such as in the years before the beginning of the global financial crisis. Also, the results from an event study are difficult to generalise, by definition, and would require the occurrence of similar events for the results to be updated.

The funding cost advantage method using credit rating agency data is not only straightforward to implement, but may have some additional conceptual advantages compared to the alternative methods. According to one respondent, the conditions of bank bond issuance are sensitive to rating agency assessments and, thus, this methodology captures a large part of the theoretical pecuniary benefit that banks derive from perceived implicit guarantees. Given that the funding cost advantage method using market price distortions is rather difficult to implement and that the information on bank debt exploited by this method is similar to the rating-based approach, the former may only be worth pursuing if one is much more confident in one's own ability to isolate the characteristics which drive credit worthiness than one is in the ability by professional ratings agencies to do so.

While contingent claims analysis is conceptually attractive, in practice short-term market price volatility can result in large changes in the estimated values of implicit guarantees, which are hard to explain. Also, this measure may be problematic for regulatory authorities to employ, as it requires an assumption on the bail-out trigger point at which the guarantee would be provided. Under those circumstances, there is a risk that the assumed trigger reflects political goals rather than an analytical assessment of what that trigger objectively might be. For example, if there was a policy statement to the effect that too big to fail had been ended, then there may be pressure to set the trigger point to zero – i.e. there is no implicit guarantee – regardless of whether this was an analytically fair assessment. Contingent claims analysis may be a reasonable methodology to produce a reference value for the estimates obtained from the funding cost advantage methodology,

but, according to that respondent, the funding cost advantage method, based on credit rating data, is perhaps the most "natural" choice.

That said, rating agencies have been found wanting in terms of accuracy of their assessments. Under those circumstances, relying on their subjective judgments does not appear to be appropriate. While a valid criticism, other estimation methods are not completely immune to this criticism to the extent that rating agency opinion affects investor demand for bank debt and the observed actual bank funding costs (Noss and Sowerbutts, 2012).

There is however no single best approach of estimating the value of implicit bank debt guarantees

From the discussions of the issue at the meeting of the CMF in April 2014, a consensus view emerged that all estimation methods have some flaws. That being said, it was argued that these flaws should be recognized in interpreting the results of estimations but that they should not be used as an excuse to not undertake efforts to estimate the value of implicit guarantees.[3]

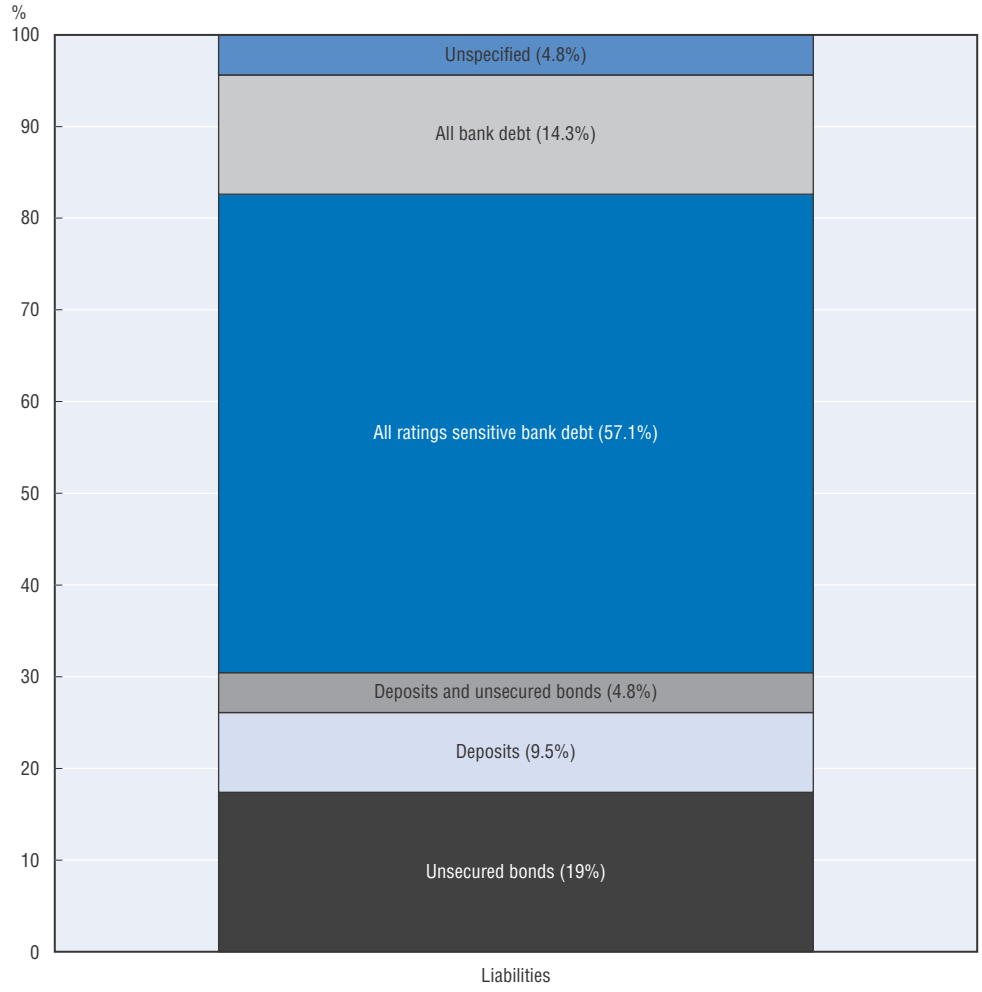
The discussions confirmed that public authorities do not have official views on the value of implicit bank debt guarantees and on the best ways of estimating such values, in particular as they are trying to convince banks and their counterparties that they do not intend to provide such guarantees. Implicit bank debt guarantees are (market) perceptions rather than any explicit commitments of guarantees. It was noted that the observation that the funding cost advantage method based on credit rating agency data is widely used by respondents to the OECD/CMF survey and should not been interpreted as testifying to the superiority of that approach over alternatives. The Committee should not engage in developing a single "CMF standard" for measuring the value of these guarantees especially as there are costs associated with such efforts that might at some point outweigh its benefits. Rather, there is value in the Committee adopting a reasonable estimation approach (as done in previous work by the Committee) and revisiting the results from that approach from time to time to assess progress in regulatory reform and in reducing the value of implicit guarantees.

But even where similar approaches are used, details of the estimation differ

Even when a similar method was used (i.e. mostly the funding cost advantage approach using credit rating data), the specific assumptions made as part of the estimation process showed considerable variation. Most estimates were conducted on a cross-border basis including a set of banks from several jurisdictions (as opposed to considering only a domestic set of banks), but the numbers and types of banks and the credit rating agency data considered differed. Most of the studies used data from Moody's, although some also used data from FitchRatings. One estimate used data from all three rating agencies, although these estimates did express the funding costs advantages only in terms of credit rating uplifts and not in terms of basis points of interest rates or costs saved as a result of the credit rating uplifts.

Estimates also relate to different types of bank liabilities. The majority of respondents (57%) referred to measures of what they considered all "ratings-sensitive" bank debt to evaluate the funding cost advantage, while 14% of respondents considered all bank debt instead (Figure 4). Obviously, the choice of one or the other type of bank liability considered matters for the estimated total pecuniary value of the implicit guarantee.

Figure 4. **What types of liabilities do estimates of the value of implicit bank debt guarantees refer to?**



Note: Percentages of OECD/CMF survey respondents reporting that the estimates available for their country refer to one of the types of liabilities shown. Multiple answers allowed.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

Available estimates suggest very substantial funding cost advantages for banks

Several respondents reported estimates of the value of implicit bank debt guarantees in terms of basis points of interest rates of funding advantages, total funding advantages in local currencies and as of GDP, with all these estimates suggesting that the value of implicit bank debt guarantees can be substantial.[4]

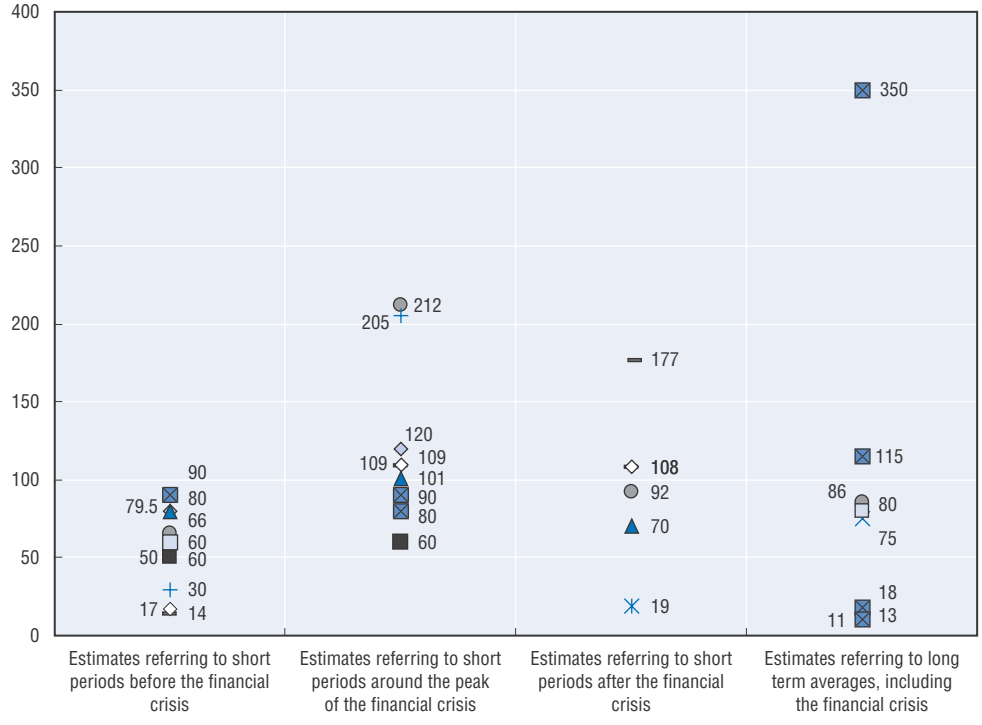
Comparing estimates across countries is difficult; reporting estimates by respondents from different countries next to each other might suggest comparability across countries, which however is not really the case. In fact, even when a similar estimation method is chosen, the detailed assumptions made and the choice of banks and periods differ and make direct cross-country comparisons based on the available type of data difficult and potentially misleading. Against this background, it appears to be more meaningful to exploit as much as possible the time-series information available.

A summary of estimates of *funding cost advantage in basis points of interest rates* is shown in Figure 5. Even though not strictly comparable across different studies, the estimates

suggest that the values peaked at the height of the global financial crisis, while it was also substantial after the crisis and in several countries also before the crisis. Before the crisis, estimates ranged between 14 and 90 basis points, depending on country and year, with most estimates ranging between 50 and 80 basis points. During the crisis, the funding cost advantage rose well above 100 basis points, in the case of one country even up to 212 basis points. On average, over longer-term periods, that is over periods spanning between 5 and 20 years including the financial crisis episode, several estimates were remarkably similar across countries at around 80 basis points. In that sense, a funding cost advantage of close to a full percentage point seems to be rather common.

That said, as mentioned earlier, the use of contingent claims analysis can lead to large variations in estimates due to rather small changes in assumptions, as illustrated in Figure 5 by the results of some work that results in two vastly different estimates using the same sample but different assumptions regarding the behavior over time of the default threshold (assumed to be constant or, alternatively, time-varying).

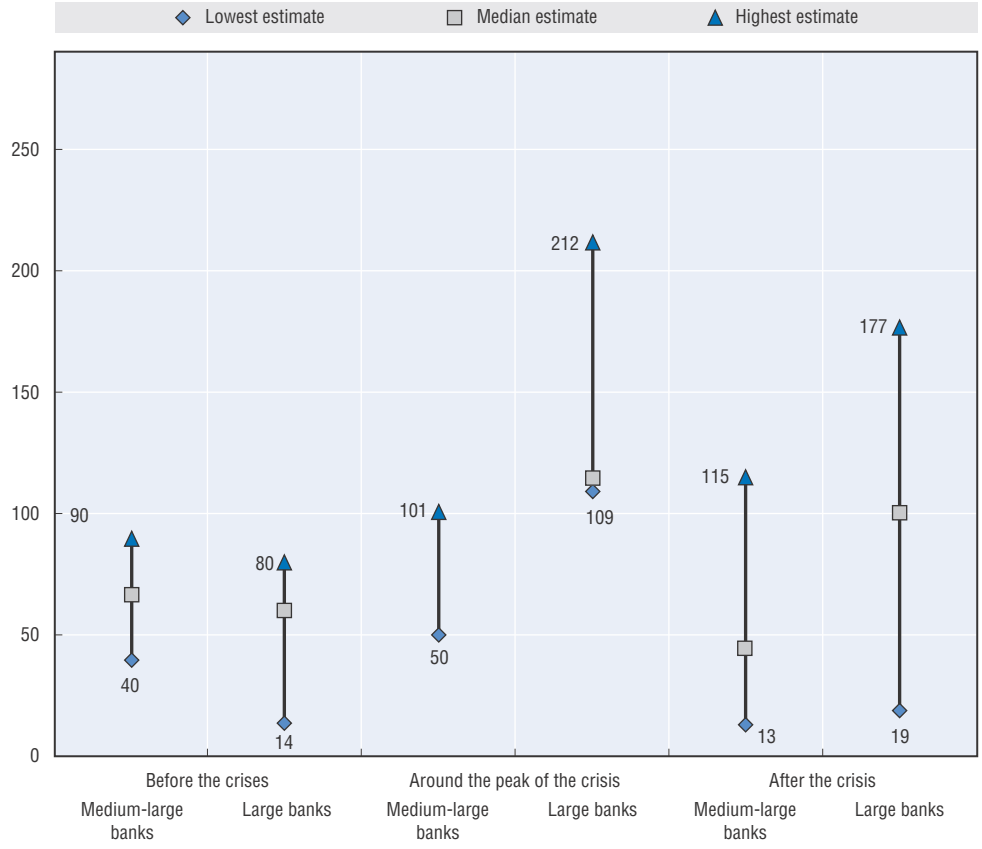
Figure 5. **What do estimates suggest in terms of advantages for bank funding in interest rate basis points?**



Note: Estimates in basis points as reported by respondents to the OECD/CMF Survey on implicit guarantees on bank debt. Symbols refer to different countries. The underlying assumptions and samples differ across countries. Mid-point estimates are shown for studies that report ranges. Some respondents only provided estimates of rating uplifts. These were converted into basis points of funding advantages by using the estimated average sensitivity of interest rates to credit ratings during the year specified, as estimated in Schich, Bijlsma and Mocking (2014), which assumes that the estimated sensitivity of yields to ratings is similar for all sample countries. "Short periods" refer to estimation periods between one to three years and "long term averages" to periods covering up to twenty years. The estimates may include published results.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

Distinguishing between the size of banks that are covered in the empirical estimates, one finds that estimates based on samples of large banks tend to be larger than those of samples considering both large and medium-sized banks (Figure 6). This difference is particularly pronounced around the peak of the crisis.

Figure 6. **Range of estimates combining data for all countries**



Note: Estimates reported by respondents to the OECD/CMF Survey on implicit guarantees on bank debt, distinguishing by the time period and (size of) sample banks considered. Number of studies referred to differ from one period to another. The median estimate is the median of the estimates of different studies, reported here as long as the number of studies is at least five. Where a study produce ranges of estimates, the mid-point estimates are considered for that specific study. The estimates may include published results.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

The funding costs advantage is sizeable from the point of view of the bank and its overall income and costs. For example, in 2009, the annual implicit guarantee for a large bank in one respondent country was equivalent to between 10 and 40% of that banks' total pre-tax revenue. Obviously, both the value of the funding cost advantage and bank revenues fluctuate from one year to another, but this example highlights that the role of funding costs advantages due to implicit guarantees can matter for bank profitability.

Expressing the funding cost advantages in billions of USD and as a percentage of GDP, estimates confirm that the value of implicit bank debt guarantees can be quite substantial. The annual funding cost advantage ranges between half a billion and 12 billion USD in countries with smaller banking sectors (although in one of them, only one third of this amount is due to government support, and the remainder due to parental support) to close

to or even more than USD 100 billion for countries with large banking sectors, depending again also on the year considered. In terms of GDP, estimates range from 0.2% to 3% of GDP, often close to 1 % of GDP.

Estimates of the value of implicit bank debt guarantees change considerably over time

Where time series estimates are available for a specific country, they suggest that the value of implicit bank debt guarantees varies considerably over time. In particular, the observed pattern is broadly similar to that described for the funding advantages in basis points described above. For example, total funding cost advantages as of GDP peaked in 2009, but they were also quite substantial before and after that year. One respondent reported values equivalent to 0.7% of GDP for 2007 and of 2.7% for 2009. Subsequently, that value fell again to 1% of GDP in 2010. On average over the period from 2002 to 2010, the annual funding advantage amounted to just below one per cent of GDP in that country.

The variability over time remains evident even if one aggregates the results from different studies (an approach recently suggested by Kloeck, 2014), although the resulting time series is hard to interpret given that it reflects the use of different methods and samples in the underlying estimates. Such a synthesis estimate of previous empirical results tends to underestimate the volatility over time, but it is nonetheless useful to obtain a ballpark estimate of the quantitative importance of the value of implicit bank debt guarantees and the broad directions of change in that value over time. According to that synthesis, this (averaged) funding cost advantage varies between around 70 and over 100 basis points (Appendix A.1).

Developments in the value of implicit bank debt guarantees are not monitored regularly

As regards the frequency of estimates, about 74% of respondents from jurisdictions where such estimates were available reported that estimates were produced on a one-off basis (Figure 7). 13% of respondents reported that they were produced at irregular intervals and another 13% that estimates are being produced regularly. Thus, as a general rule, the value of implicit bank debt guarantees is not monitored on an ongoing basis.

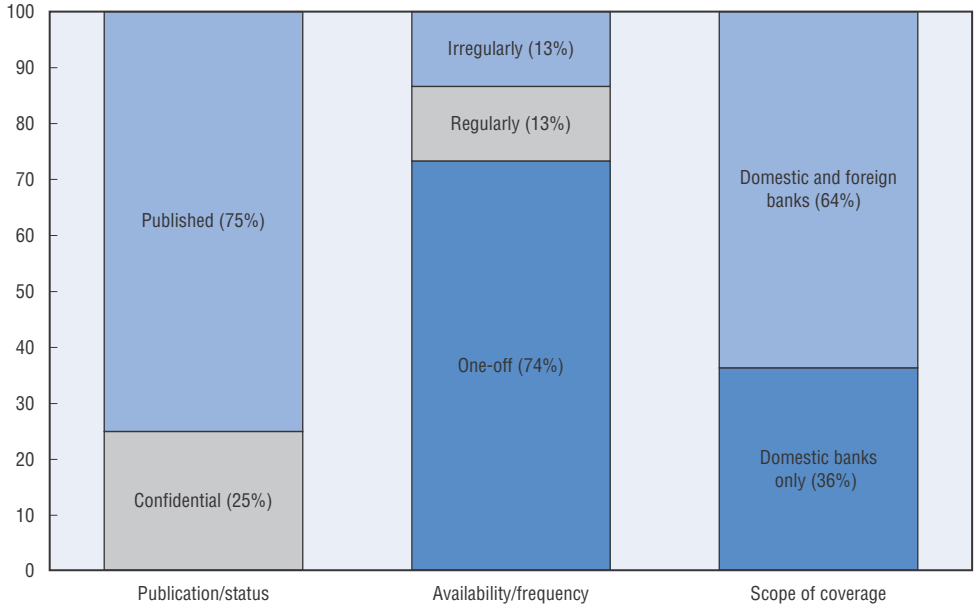
Since the estimates are not regularly updated, the effect of recent policy changes, are typically not reflected in the estimates. For example, among the more recent studies, Warburton, Anginer and Acharya (2013) cover the period up to 2010, but thus do not capture the effects of the implementation of the Dodd-Frank Act. Similarly, the data used in Araten and Turner (2012) and Schweikhard and Tsesmelikadis (2011) end in 2011 and 2010, respectively. Most recent academic studies are thus not directly helpful in assessing the effects of the most recent regulatory reform measures.

Another finding from the OECD/CMF survey responses is that, where estimates of implicit bank debt guarantees are available, they are typically published. Only 25% of respondents that are aware of estimates or have produced them reported that estimates were considered (at least partly) confidential.

Relatively little seems to be known about the economic costs of implicit guarantees

The preceding discussion focused on the private value of the funding benefits on the part of banks arising from implicit guarantees and that these, in turn, could give rise to wider economic costs of implicit guarantees. In discussing the draft survey, one delegate

Figure 7. **What is the nature of estimates?**



Note: Percentage of respondents to the OECD/CMF Survey on implicit guarantees on bank debt.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

suggested adding a question as to whether authorities have undertaken empirical estimates of the economic costs e.g. in terms of the creation of contingent fiscal liabilities, excessive risk-taking by banks, output losses due to financial instability or distortions to competition. Obviously, subsidised funding for the banking sector implies that too many resources and too much capital is channeled into that sector as opposed to other sectors.

No respondent to this question provided an example of this kind of research, however, although one respondent noted that the capitalised value of the annual funding benefit for banks should in principle provide a measure of the expected fiscal costs. Future work by the CMF could potentially address this issue as well as the effect on competition and resource allocation, especially as these issues relate to the broader issue of interest to the Committee of the link between finance and real activity growth.

III. Analysing the determinants of the value of implicit bank debt guarantees

Measurement and analysis of the value of implicit guarantees

It can be helpful to distinguish the *measurement of the value of implicit bank debt guarantees* from the *analysis of the determinants of that value*. The former could be seen as an input to the latter, which in turn provides an input to the development of specific guidance for the design of policies aiming to limit the value of implicit bank debt guarantees. In particular, a careful analysis of the determinants of the changes in the value of implicit bank debt guarantees, e.g. by regressing the estimate of the value of implicit guarantees on its likely determinants allows one to control for other factors and to disentangle the effects of specific policies from those of other factors and to identify the specific role of policies in limiting the value of implicit bank debt guarantees.

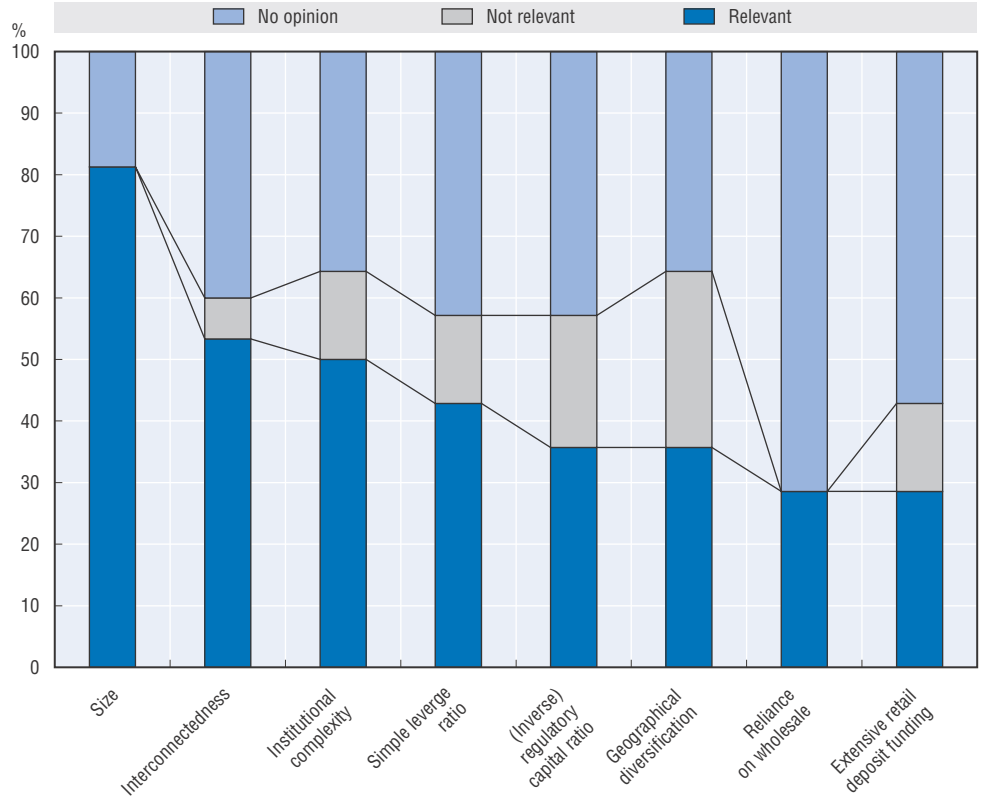
The value of an implicit bank debt guarantee is however not always measured directly in empirical studies (e.g. as is the case when the funding costs advantage is inferred from credit rating agency data), but is also often measured in an indirect way (e.g. when inferring

to the value of implicit guarantees through an analysis of observed market prices). The latter essentially combines the measurement of the value of implicit guarantees with an analysis of their determinants. In particular, these studies – rather than using an estimate of the value of implicit bank debt guarantees as dependent variable – consider another variable that reflects the effect of implicit guarantees as dependent variable and explain its variation controlling for other factors. By including a variable that is expected to capture the effect of the existence of implicit guarantees and just that effect (e.g. the credit rating of the sovereign in a regression on bank funding conditions when other bank-specific factors and market conditions are already controlled for), the coefficient of that variable provides an indirect measure of the value of implicit bank debt guarantees.

The determinants of the value of implicit bank debt guarantees are not well understood

The OECD/CMF survey asked what respondents, based on either statistical or anecdotal information, consider to be the main bank characteristics that tend to increase the value of its implicit debt guarantees. Some factors were widely identified as important drivers of the value of implicit bank debt guarantees. Foremost bank size; 81% of responses suggest that size is one of the main bank characteristics that increase the value of implicit bank debt guarantees, while no respondent considered size as irrelevant (Figure 8).

Figure 8. **What are the main bank characteristics considered to increase the value of implicit guarantees?**



Note: Percentages of responses considering the variable shown as "relevant" or "not relevant" or not expressing any specific opinion ("no opinion"). "Liquidity crisis" and "institution's political traction" were also mentioned by respondents in addition to the choices offered as possible explanations in the OECD/CMF survey.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

Interconnectedness, institutional complexity and leverage of banks were also considered relevant, each aspect increasing the value of the banks' implicit debt guarantee. One respondent noted that the value of the characteristics is likely to vary with market conditions. In particular, in crisis situations, when there is greater fear of complexity and its effects, the value of an implicit may rise in particular for relatively more complex firms.

The role of standard measures of bank strength, such as capitalisation and (inverse) leverage, credit rating, or distance-to-default is borne out by many empirical studies. Bank size and measures of systemicness of a bank are considered as important determinants in many empirical studies of bank funding costs (Appendix A.2). Several studies use bank size as measured by assets in absolute values or compared to that of peers or domestic GDP as a measure of the potential systemic importance of the bank, which appears to be a reasonable approximation given that many of the measures of systemicness suggested in the literature and considered by the FSB strongly correlate with bank size. Some studies have also considered the role of other bank balance sheet structural measures (that are less directly linked to bank strength) as independent variables in empirical analyses related to the value of implicit bank debt guarantees (e.g. EC, 2014).

But what exactly drives the changes in the value of implicit bank debt guarantees *over time* is somewhat less well understood and requires further analysis. In fact, while the determinants of those values may reside either within or outside of the bank, the focus of the related question in the OECD/CMF survey was on bank-specific factors, including measures of their capital strength and the structure of their business activities.

The crucial roles of the strength of the guarantor is increasingly appreciated, however

The location of where a bank is headquartered also matters for the value of implicit bank debt guarantees. A BIS (2011) study found that between the onset of the global financial crisis in 2007 and mid-2011, the perceived level of implicit support for large banks in major advanced economies generally increased, thus partly cushioning a significant worsening of banks' standalone ratings. From the beginning of the sovereign debt crisis at end 2009 to mid-2011, however, concerns about the solidity of public debt in several euro-area countries implied that the value of implicit government guarantees for the liabilities of large banks also declined very significantly. This assessment is consistent with the observation that the strength of the sovereign is conceptually a key determinant of the value of implicit bank debt guarantees, in addition to the strength (or weakness) of the bank (Estrella and Schich, 2011). With the sovereigns in several countries experiencing heightened stress and downward credit rating pressures, the value of implicit guarantees for their domestic banks came under pressure (Correa et al., 2012).

Under those circumstances, the assessment of the observed declines in estimated values of implicit bank debt guarantees needs to be nuanced. On the one hand, a decline in the value of implicit bank debt guarantees tends to strengthen the functioning of market discipline, which is a welcome development in itself. On the other hand, to the extent that this change results from a weakening of the perceived guarantor, the underlying cause is obviously undesirable. Moreover, as long as the strengths of sovereigns differ from one another, additional competitive distortions might arise, with some banking sectors benefitting from systematically lower funding costs than others regardless of the banks own strength but mainly reflecting the strength of their sovereign (see e.g. Cardillo and Zaghini, 2012).[5]

Declining values of implicit guarantees are also consistent with bank failure resolution reform progress

While declining strength of the guarantor explains some of the decline in the value of implicit bank debt guarantees, a more desirable reduction in the value of implicit bank debt guarantees would reflect progress across borders on making bank failure resolution regimes more credible and effective. The OECD/CMF survey responses were consistent with this view and they revealed considerable confidence on the part of respondents that current progress on refining recovery and resolution frameworks would have a noticeable effect on the value of implicit bank debt guarantees, limiting their extent. Many respondents noted that bank failure resolution regimes have recently changed or that changes are currently being considered at the national level, thus facilitating the involvement of unsecured creditors in burden-sharing and/or that they are considering further changes. The crucial role of these efforts was widely echoed by CMF delegates during the discussions of this issue at the meeting in April 2014.

Major efforts are being undertaken at the international level, including in particular within the Financial Stability Board, to establish effective bank failure resolution regimes and to address remaining obstacles to the implementation of resolution strategies for banks considered systemically important. In Europe, the EU Directive on Banking Recovery and Resolution (BRRD) and the Single Resolution Mechanism (SRM) are important milestones. Several responses from European countries welcomed these initiatives and some emphasised the role of bail-in in this context. One respondent emphasised the importance of the bail-in principle in dealing with troubled banks and expressed the view that bail-in is the leading principle in the ongoing work on the BRRD.

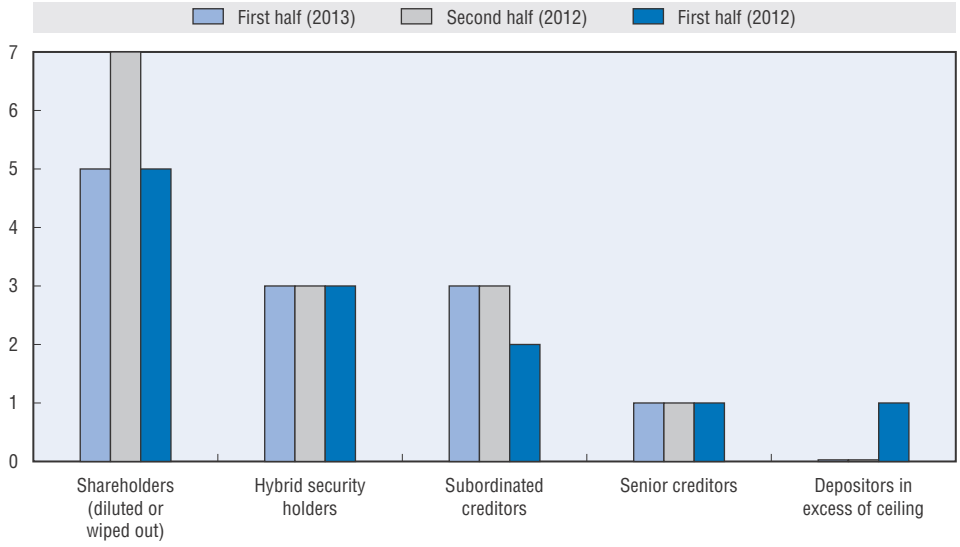
The discussions at the CMF meeting in April 2014 confirmed the argument that the drivers of the changes in the value of implicit bank debt guarantees requires further analysis, especially as regards the extent to which the changes in the value of implicit guarantees reflect changes in bank and sovereign characteristics on the one hand and recent regulatory and resolution regime changes on the other. Confirming the work agenda emerging from earlier discussions of future work, there was agreement that the CMF should investigate the link between changes in the value of implicit guarantees and changes in resolution regimes and practices as well as other policy changes. This work would complement ongoing FSB work on making resolution regimes more effective and efficient.

Actual bank failure resolution practices seem to matter

The notable progress in the area of resolution regimes notwithstanding, actual resolution practices continue to differ from textbook resolution practices. In particular, holders of unsecured bank debt have rarely been involved in the burden-sharing associated with bank failure resolution (Figure 9), even though this form of bail-in is foreseen to be implemented over the medium term.

There is a possibility that the schedule will be advanced, however, and, perhaps, some recent events already signal a trend change in failure resolution practices. Looking back, for some time now, Amagerbanken has been referred to as a notable and rare example in which bank failure resolution was based on the principle of involving senior unsecured bondholders and uninsured depositors in burden-sharing.[6] The intervention implied losses on bank debt issues that previously had been covered by an explicit state guarantee

Figure 9. **To what extent have unsecured bank creditors been involved in the loss-sharing when a bank was intervened in your jurisdiction?**



Note: Responses to this specific question were received from only 20 countries, with 9 of them reporting that there have been interventions in their jurisdictions since the beginning of 2012 and 11 reporting that there have been no interventions in their jurisdictions since the beginning of 2012. The numbers on the vertical axis refer to the number of countries in which each group of stakeholders was subject to loss sharing in the specified period.
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

but which had run out. The intervention did not result in any generalised financial market or banking sector stress, although issuance of debt by small and medium-sized Danish banks was obviously difficult during 2011 and the yields of some outstanding debt of Danish banks rose above the levels observed for the debt of some of their Nordic peers. Purchases of Danish government debt increased noticeably, however, which would be consistent with the view that investors saw these developments as signaling a reduction in the sovereign conditional liabilities.

More recently, however, interventions in the case of Laiki, SNS Reaal, and Bankia suggest that creditor participation in burden-sharing might become more of a "norm" than was previously the case (Dübel, 2013). This observation would be consistent with the conclusion of the FSB progress report on ending TBTF (FSB, 2013):

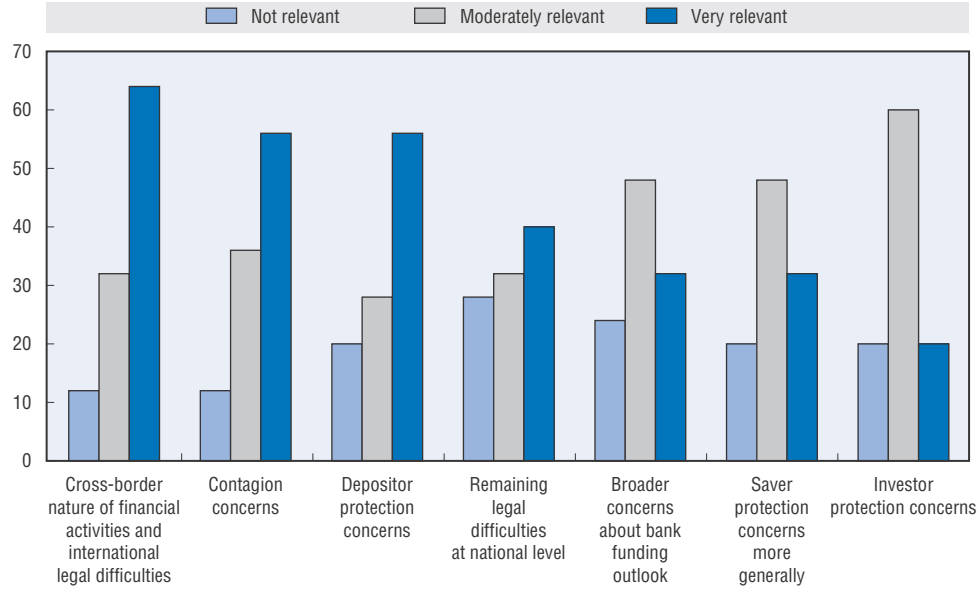
> *There are signs that firms and markets are beginning to adjust to authorities' determination to end TBTF. Where effective resolution regimes are now in place, rating agencies give less credit for taxpayer support and there are signs of financial markets revising down their assessment of the implicit TBTF subsidy. Market prices of credit default swaps for banks have become more highly correlated with equity prices, suggesting a greater expectation amongst participants that holders of debt will, if necessary, bear losses. However, the job is not finished. If we are to resolve the issues related to SIFIs and in particular the problem of TBTF, further action is required from G-20 countries, the FSB and other international bodies.*

Remaining obstacles to involving bank debt holders in the burden sharing associated with bank failures

What are the remaining obstacles to involving unsecured and uninsured bank debt holders in the burden sharing of bank failures? The OECD/CMF survey respondents

identified several remaining obstacles. Chief among those are concerns about the cross-border nature of financial activities and international legal difficulties, 64% of respondents considering these aspects as very relevant and around 12% as not relevant (Figure 10). Contagion concerns were also considered very relevant by 56% of respondents, while only 12% of respondents considered such concerns as not relevant.

Figure 10. **How relevant are the following potential concerns to involving unsecured and uninsured bank debt holders in the burden-sharing associated with bank failures?**



Note: Percentages of responses considering the concerns that are listed as either "not relevant", "moderately relevant" or "very relevant".
Source: OECD/CMF Survey on Implicit Bank Debt Guarantees.

While depositor protection concerns were considered very relevant by a large number of respondents, a significant number of respondents considered those concerns as not relevant. Remaining legal difficulties at the national level were considered very relevant by 40% of the respondents, with the remaining half split between those considering these concerns moderately relevant and those considering these concerns as not relevant. Broader concerns about the bank funding outlook were also considered either moderately or very relevant by a large number of respondents.

VI. Concluding remarks

Developments in the value of implicit bank debt guarantees need to be measured

There is a consensus among CMF participants that the availability of and the results from a robust measure of the value of implicit bank debt guarantees is a key input to assessing regulatory reform progress and its effect on the value of implicit bank debt guarantees. Policymakers have clearly announced their intention to rein in the value of implicit bank debt guarantees and related efforts are likely to be more effective to the extent that the value of implicit guarantees is measurable and measured at regular intervals.

The responses to the OECD/CMF Survey on implicit bank debt guarantees revealed that authorities in several countries are aware of such estimates and/or produce their own estimates, although in almost all of these cases, estimates have been produced at irregular intervals or on a one-off basis, and not on a regular basis. Authorities agree that there is currently no single best method of estimating the value of these guarantees.

Many respondents, most of which are not from countries with large banking sectors, have neither produced such estimates nor are they aware of credible estimates for their jurisdiction. The overwhelming majority of these respondents is however planning to undertake such estimates and/or welcoming that such estimates be developed within the CMF (74% of respondents where estimates are currently unavailable). That said, CMF discussions concluded that the Committee should not attempt to develop a "standard" for measuring implicit bank debt guarantees, given the various difficulties involved in measuring perceptions and the observation that all methods have some flaws.

Where estimates are available, they suggest that the value of implicit bank debt guarantees is substantial

Where estimates are available, whatever method is used, the results suggest that the value of implicit bank debt guarantees is substantial. Although estimates vary across countries, banks and over time, the estimated funding cost advantage ranges between 50 and 80 basis points and it increases during crisis situations well above 100 basis points. In fact, the combined empirical evidence suggests that estimated values peaked between 2009 and 2010 and that they have declined since then, although not necessarily below the levels that could be observed prior to the global financial crisis.

In absolute terms, the estimated funding costs advantages can amount to the equivalent of around USD 10 billion on an annual basis for banking sectors in some jurisdictions and, in many cases, they are estimated to represent the equivalent of 1% of domestic GDP; in crisis situations, this value could rise to close to 3% of domestic GDP.

The drivers of changes in the value of implicit guarantees over time are not well understood

Among the bank-specific factors identified as important determinants of the value of implicit bank debt guarantees, bank size was mentioned as relevant by 90% of all responses to the OECD/CMF survey, while no respondent considered size as irrelevant. The role of other bank-specific factors and those relating to the structure of their business is somewhat less clear, although large size, interconnectedness and institutional complexity and high leverage are considered by OECD/CMF survey respondents as characteristics that tend to increase the value of implicit bank debt guarantees. The strength of the sovereign, in addition to the strength of the bank, is an important determinant of the value of implicit bank debt guarantees, and the relevance of this link is increasingly being appreciated by researchers as well as policymakers. Certainly, the value of implicit guarantees is expected to decline as bank failure resolution regimes become more effective and the associated instruments are used in practice.

Since estimates are not regularly updated, however, the effect of recent policy changes (discussed in more detail in a companion report), most of which were implemented in 2010 or are being currently implemented or considered, is not reflected in the estimates currently available. Clearly, some of the effect of these measures is already anticipated, but

there still remains some uncertainty as to the extent to which some of the principles underlying them will be implemented in accrual practice.

More generally, not enough is known about the drivers of changes in the value over time, as estimates are typically not produced on a regular basis and not subjected to rigorous statistical analysis to understand their economic determinants when they are produced. Delegates agreed on the need to better understand to what extent the observed decline in value reflects a strengthening of banks, the progress in bank regulatory and bank failure resolution reforms, an overall declining likelihood of financial stress, or declining strength of the sovereigns seen as providing the guarantee.

Notes

1. The Committee, as part of its discussions of the issue of banking sector developments in 2012, welcomed that the OECD Secretariat, in collaboration with staff from the Swedish Riksbank, provided one approach to estimating implicit bank debt guarantees on unsecured bank bonds on a cross-country basis (Schich and Lindh, 2012). The Committee considered the results plausible, but nonetheless wondered whether a survey of approaches taken by CMF members could identify alternatives to the approach taken and facilitate the cross-border comparative analysis of such measures of the value of implicit bank debt guarantees.
2. Note, in this context, that Warburton, Anginer and Acharya (2013) examine the impact of two specific events, namely the US Government's rescue of Bear Sterns on March 17, 2008 and the collapse of Lehman Brothers on September 15, 2008, on the credit spreads of large US financial institutions using event study methodology. In addition, they examine the effects of the adoption of the Dodd-Frank Act. Damar, Gropp and Mordel (2012) analyse the effect of public guarantees on risk-taking behaviour of banks (rather than their funding costs), using the example of the introduction, in October 2006, by dominion Bond Rating Service of a new assessment methodology for banks that accounts for government support.
3. One delegate noted that one approach that could be further explored is to focus on the contingent liabilities created for sovereigns, as one of the purposes of policy makers to focus on the issue of implicit bank debt guarantees is to reduce the extent of such liabilities. At the same time, another delegate noted that such estimates however run the risk of reinforcing market perceptions that implicit guarantees exist, while policy makers should be concerned about dispelling such perceptions.
4. This assessment is consistent with recent empirical research such as IMF (2014) and Santos (2014).
5. Cardillo and Zaghini (2012) analyse the determinants of funding costs of banks in the euro-area countries, the UK and the US, controlling for the issue and issuer characteristics as well as the sovereign strength. They find that being located in a "financially weak" country, proxied by a non-triple A rating for the respective sovereign adds a significant burden on debt issuance and even on the issuance of government guaranteed debt which is severe in the period of debt crisis.
6. That bank was taken over in February 2011 by the Danish bank regulator due to insufficient capitalisation. The regulator applied Bank Package III and sold the good parts of the bank. The insured deposits were paid off by the Danish deposit guarantee scheme, which in turn received a first claim on sales proceeds of the good parts as well as assets remaining to be sold by the regulator. In the process, subordinated bonds were entirely wiped out. See for details Dübel (2013).

APPENDIX A.1

A synthesis of results from different empirical estimates

Table A.1.

Study	Weight assigned to study	Implicit subsidy in basis points					
		2007	2008	2009	2010	2011	2012
Schich and Lindh, OECD (2012)	1	111	120	157	156	109	110
Haldane (2010), UK large banks sample	0.7		100	200			
UK small banks sample	0.55		100	100			
Noss & Sowerbutts, BoE (2012), FCA	0.7				54		
Contingent claims analysis, assumption I	0.5				175		
Contingent claims analysis, assumption II	0.5				36		
Contingent claims analysis, assumption IIII	0.5				29		
Ueada & di Mauro (2012)	0.8	60		90			
Oxera (2011)	0.25				8		
Sveriges Riksbank (2011)	0.5	86	86	86	86	86	86
Moody's Analytics	0.6		105	105	105	105	
Bijlsma & Mocking (2013)	1		5	16	15	31	30
Weighted average of above estimates		**91**	**82**	**106**	**79**	**79**	**73**

Note: Kloeck (2014) addresses the issue that the results of different empirical estimates are not reported in the same metric by mapping the reported results to estimates of funding cost advantages (FCA) in basis points (see for an example appendix 4 of that report). The study calculates the weighted average of the implicit subsidies in basis points for each year by aggregating the results from different studies and assigning a specific weight to each study. The weight is determined as a function of the author's assessment of robustness, transparency and sample coverage of each study's estimate. The ordering of studies shown above follows Kloeck (2014).
Source: Kloeck (2014).

APPENDIX A.2

Selected results of empirical studies

Selected results of empirical studies

Author(s)	Data (dependent variable: credit rating uplift)	Strength of bank	Systemic importance of bank	Strength of guarantor	Variables capturing the structure of bank activities
Soussa (2000)	Cross-section; 120 banks; 6 countries; 1999.		●	●	
Haldane (2010)	28 international including UK banks; 2007-09.		●		
Schich and Lindh (2012)	Cross-section; 123 European banks; 17 countries, 2010 to 2012	●	●	●	
Van Roy and Vespro (2012)	245 European banks, 2012.	●	●	●	
Bijlsma and Mocking (2013)	151 European banks; 23 countries, 2006-12.		●	●	
Estrella and Schich (2011)	Cross-section; 100 European banks; 2011.	●		●	
Correa, Lee, Sapriza, Suarez (2012)	295 banks; 37 countries; 1995-2011.		●	●	●, ○
Schich (2013)	Panel data, 184 banks, 23 countries, 2007-12.	●		●	
European Commission (2014)/ Cariboni et al. (2013)	Panel data; 112 European banks; 23 countries; 2007-12.	●	●	●	●, ○

Selected empirical studies of the determinants of bank funding costs

Author(s)	Data (dependent variables: yield spreads, inverse of credit ratings, etc.)	Strength of bank	Systemic importance of bank	Strength of guarantor	Variables capturing the structure of bank activities
Ueda and Mauro (2012)	895 banks, 95 countries, year-end 2007 and year-end 2009, long term rating of the bank as the dependent variable	●		●	
Van Roy and Vespro (2012)	245 European banks, 2012, long term rating of the bank as the dependent variable	●		●	
Angelini, Nobili and Picillo (2011)	Interbank credit spreads All Euro-denominated transactions executed on e-MID, January 25, 2005-December 31, 2008	●	●		○
Araten and Turner (2012)	250 BHCs, first quarter of 2002-first quarter of 2011, cost of deposits, cost of FED funds, bond OAS, CDS spread as the dependent variables	●	●		○
Cardillo and Zaghini (2012)	651 banks, 14 countries, 1997-2011, asset swap spreads at launch as the dependent variable	●	○	●	
Beyhaghi, D'Souza, Roberts (2012)	Cross section, 6 large Canadian banks, 1990-2010, effective interest rate paid on debt and credit spreads at the time of issuance as the dependent variables	●	●	●	●
Warburton, Anginer and Acharya (2013)	567 financial firms in the US, 1990-2010, credit spread on the bond issued as the dependent variable	●	●		
Schweihard and Tsesmelikadis (2011)	74 US financial firms, January 2002-September 2010 CDS spread as the dependent variable	●	●	●	
Tsesmelikadis and Merton (2012)	74 US financial firms, January 2002-September 2010 CDS spread as the dependent variable	●	●	●	

Note: Symbols ● and ○ denote that the variable is found to be "significant" or "insignificant" respectively, at conventional levels of significance by the study under consideration. To proxy "strength of bank", most of the above listed studies use banks' stand-alone credit ratings and some use additional bank specific variables to proxy bank strength, e.g. the ratio of equity to assets, distance to default measures, etc. The "measure of systemic importance of bank" often consists of a measure of bank size and sometimes of its interconnection with other banks, etc.

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ANNEX

OECD work on financial sector guarantees

OECD work on financial sector guarantees has intensified since the 2008 global financial crisis as most policy responses for achieving and maintaining financial stability have consisted of providing new or extended guarantees for the liabilities of financial institutions. But even before this, guarantees were becoming an instrument of first choice to address a number of financial policy objectives such as protecting consumers, investors and achieving better credit allocations.

These reports analyse guarantees in light of ongoing market developments, incoming data and related analysis and discussions within the OECD Committee on Financial Markets. They show how the perception of the costs and benefits of financial sector guarantees has been evolving in reaction to financial market developments, including the outlook for financial stability. Find these articles online at *www.oecd.org/finance/financialsectorguarantees.htm*.

Policy Responses to the Issue of Implicit Bank Debt Guarantees: Key findings from OECD survey, forthcoming in August 2014. Bank regulatory reform measures are expected to limit the value of implicit bank debt guarantees, even if not plainly targeting such values. According to a survey of 35 countries, there is no one specific policy capable of fully eliminating the market perception that bank debt is "special", however. A mixture of several different and complementary policy measures is considered as offering the greatest promise in this regard.

Measurement and analysis of implicit guarantees for bank debt: OECD survey results, June 2014. This report describes the key findings from responses by 35 countries to a survey on implicit guarantees. Policy makers have announced their intention to rein in the values of implicit guarantees so it is important to measure their value to help facilitate the task of assessing progress in reducing their value. While no preferred method for measuring such guarantees exists, the survey shows that their value is substantial, whatever measurement approach is used. In several countries, they represent bank funding cost advantages equivalent to 1% of domestic GDP, with values increasing as much as threefold in financial crisis situations.

Improving the monitoring of the value of implicit guarantees for bank debt, March 2014. The value of implicit guarantees has declined from its peak at the height of the financial crisis, which is consistent with progress made regarding the bank regulatory reform agenda. Implicit guarantees persist however and their value continues to be significant. Bank debt continues to be considered "special" by market participants and this observation implies

that the substantial economic distortions, including distortions to risk-taking incentives and competition, arising from this situation also persist.

Developments in the value of implicit guarantees for bank debt: The role of resolution regimes and practices, November 2012. This report concludes that actual application of bail-ins, involving bondholders in loss sharing, could effectively reign in perceptions of implicit guarantees for bank debt. However, bail-ins are rare owing to concerns about contagion risks and depositor and investor protection, so implicit guarantees persist.

Implicit guarantees on bank debt: Where do we stand?, June 2012. The incidence of perceived implicit guarantees, mostly from governments, for the debt of European banks has decreased recently after several years of increase dating from the beginning of the financial crisis. This reflects to a large extent the deterioration in the strength of the sovereigns that are seen as providing the guarantees.

Systemic financial crises: How to fund resolution (2010) – *Selected updates* (2012). Systemic financial crises are a recurrent phenomenon, and despite regulatory efforts, they are likely to occur again. This report compares the ex-ante funding of deposit insurance schemes in a selection of countries, highlighting the "funding gap" left by these arrangements in the recent systemic financial crisis.

Financial crisis management and the use of government guarantees, December 2011. A selection of papers from a Symposium on bank failure resolution and crisis management, in particular, the use of guarantees and the spill-overs between the credit qualities of sovereigns and banking systems.

Guarantee arrangements for financial promises: How widely should the safety net be cast?, June 2011. Guarantee arrangements have proliferated as guarantees have become a preferred policy instrument for addressing financial stability, consumer protection and credit allocation concerns. This report argues that the wider the net of government-supported guarantees for financial promises, the thinner it becomes.

The Design of Government Guarantees for Bank Bonds: Lessons from the Recent Financial Crisis, July 2010. Government-guarantees for bank bonds have been an effective tool for avoiding the worst during the financial crisis. However, the pricing of the guarantees has created competitive distortions and the continued availability of such guarantees for an extended period may have reduced the pressure on some banks to address their weaknesses.

Expanded Guarantees for Banks: Benefits, Costs and Exit Issues, November 2009. When the crisis struck, governments expanded their role as providers of safety nets for financial institutions by becoming guarantors of last resort. It is questionable whether this function can ever be fully withdrawn. If not, banks should be charged commensurate premium charges in exchange for the provision of this new function.

Expanded Government Guarantees for Bank Liabilities: Selected Issues, May 2009. Government provision of a safety net for financial institutions has been a key element of the policy response to the current crisis. This report discusses pricing and other selected issues related to the recent expansion of guarantees for bank liabilities.

Financial Crisis: Deposit Insurance and Related Financial Safety Net Aspects, December 2008. Whenever a crisis hits, interest in guarantee arrangements rises. This paper looks at structural issues relating to how parts of the financial safety net are combined, with a special emphasis on deposit insurance and its interaction with other safety net elements.

Financial Turbulence: Some Lessons Regarding Deposit Insurance, June 2008. The financial crisis brought the adequacy of financial safety nets, including deposit insurance, into the spotlight. This report reviews the issue of deposit insurance and provides a brief overview of some of the key challenges related to the design of explicit deposit insurance systems.

Challenges Related to Financial Guarantee Insurance, June 2008. Private bond insurers have traditionally provided guarantees of payments on municipal bonds, but have become increasingly involved as guarantors of elements of various structured financial products. This change in their activity has become the focal point for concerns about the financial health of these entities.