

Why implicit bank debt guarantees matter: Some empirical evidence

by

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What are the economic effects of implicit bank debt guarantees and who ultimately benefits from them? This paper finds that “financial excesses” – situations where bank credit reaches levels that reduce economic growth – have been stronger in OECD countries characterised by larger values of implicit guarantees and where bank creditors have not incurred losses in bank failure resolution cases. Also, implicit bank debt guarantees benefit financial sector employees and other high-income earners in two ways, increasing income inequality. First, implicit guarantees are likely to raise financial sector pay. This is consistent with the observation of “financial sector wage premia”, or financial sector employees earning in excess of their profile in terms of age, education and other characteristics. Second, implicit guarantees are likely to result in more and cheaper bank lending. If so, well-off people tend to benefit relatively more since household credit is more unequally distributed than income.

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Executive summary

This paper sheds light on the question who ultimately benefits from implicit guarantees for the debt of financial firms and what their economic effects are. Implicit bank debt guarantees reflect the perception that the banks under consideration are so big, or so important for another reason, that the government cannot allow them to fail: they are seen as “too big to fail”. The paper investigates, in particular, whether “financial excesses” have been more extensive in OECD countries that are characterised by larger estimated values of implicit bank debt guarantees. It also looks at the issue indirectly, by assuming that implicit guarantees exist (as documented in previous work) and interpreting selected empirical findings as evidence consistent with their effects.

One key finding of the paper is that banks have lent too much to households and non-financial corporations, where the assessment that “too much” lending has occurred is based on the observation that the empirical link between a measure of bank financial intermediation and real activity growth is negative, once a certain threshold has been surpassed. Moreover, the paper finds that “financial excesses” – situations in which bank credit reaches levels that reduce real economic growth – have been stronger in OECD countries that are characterised by larger estimated values of implicit bank debt guarantees and where bank creditors have not incurred losses as part of bank failure resolution cases.

Furthermore, the paper presents empirical evidence suggesting that implicit bank debt guarantees tend to increase income inequality as they are likely to benefit primarily financial sector employees and other individuals at the upper end of the income distribution. The paper highlights two transmission mechanisms from implicit guarantees to income inequality:

- **Financial sector pay:** Financial sector employees earn more than what typically corresponds to their profile in terms of age, education and other relevant observable characteristics. The existence of these so-called “financial sector wage premia” is consistent with the view that bank employees benefit from implicit guarantees. Implicit guarantees widen the income distribution, as financial sector employees are concentrated at the upper end of the income distribution and wage premia are especially large for the top earners.
- **Household credit:** To the extent that implicit bank debt guarantees lead to more and cheaper bank lending to households, such additional lending is likely to be allocated more to high- than low-income households. This is probable since household credit is generally more unequally distributed than household income. Thus, assuming that implicit guarantees encourage credit overexpansion, they are likely to exacerbate income inequality.

These findings indicate that credit expansion has been facilitated by too cheap borrowing and that implicit bank debt guarantees have played a significant role in this process. They are also consistent with the view that at least some of the benefits of implicit bank debt guarantees flow to bank stakeholders other than the banks’ creditors, namely

their employees and customers, and that implicit guarantees tend to benefit more the well-off, thus reinforcing rather than reducing income inequality.

The 2014 OECD/CMF (Committee on Financial Markets) survey on implicit bank debt guarantees highlights that most policy-makers do not regularly monitor estimates of implicit bank debt guarantees. Looking ahead, such estimates could help policy-makers to assess the effectiveness of bank reform. Falling values of estimates would indicate success in reducing government support for hitherto too-big-to-fail banks. Indeed, estimated implicit bank debt guarantees would practically be nil if market participants took the view that the regulatory and resolution framework has become strong enough that all banks, regardless of their size, complexity or interconnectedness, can smoothly exit the market.

I. Motivation

There are numerous complex interactions between financial and real economic activity, and the experience of the recent financial crisis has added to the accumulated evidence suggesting that there are substantial economic costs arising from the mispricing of financial risks.¹ The funding cost reduction associated with implicit guarantees for the debt of financial firms is an example of the under-pricing of risks. Unlike explicit guarantees, implicit ones do not imply the obligation of the guarantor to provide for the guarantee, and they are not charged for, although the guarantee has value and creates economic costs.

An implicit guarantee is only perceived, and the guarantor may even deny its existence or make efforts to dispel the perception that an implicit guarantee exists. Notwithstanding such efforts, implicit bank debt guarantees persist and market participants believe that, for example, bank debt is special in that it benefits from support provided by public authorities. There is some good reason for that perception: despite substantial progress on making the resolution of failure of financial firms more effective, the cross-border nature and complexity of many firms implies that “smooth” exit of such firms is not the norm yet. This perception in turn creates economic costs and, in discussing the present paper, members of the CMF (Committee on Financial Markets) of the OECD highlighted that the situation creates potential contingent fiscal liabilities, competitive distortions and, in the special case of Europe, a significant barrier to fuller financial integration.

Policy-makers have recognised the various economic costs and decided to rein in the value of such guarantees, although one of the challenges in formulating the appropriate policy response is that it is not clear to whom the value of such guarantees accrues and in what ways the beneficiaries’ behaviour is affected.

This paper sheds light on the question who ultimately benefits from implicit guarantees for the debt of financial firms and what their economic effects are. It investigates, for example, whether “financial excesses” have been more extensive in OECD countries that are characterised by larger estimated values of implicit bank debt guarantees. The paper also looks at the issue in indirect ways and effectively assumes the existence of implicit guarantees for the liabilities of financial firms, placing a sharp focus on banks.² Rather than estimating the value of implicit bank debt guarantees³ and relating the estimates to the variables of interest, this part of the paper takes as a starting point that implicit guarantees exist. It then looks at the variables of interest and asks whether their development is consistent with the theoretical priors regarding the effects of implicit guarantees on these variables. The paper thus establishes stylised facts, some of which are directly related with implicit guarantees, while others would be consistent with the effects of implicit guarantees.

The paper is part of a larger, ongoing research programme by the OECD Directorate for Financial and Enterprise Affairs and the OECD Economics Department that aims to support reforms that can make the financial sector function better, thus contributing to stronger and more inclusive growth. It brings together new evidence and evidence from earlier work, applying it in a consistent and novel way to the context of the beneficiaries from implicit bank debt guarantees.

As regards the policy implications, the OECD/CMF Survey on implicit bank debt guarantees confirmed that policy-makers do not treat implicit guarantees as a stand-alone issue; rather, they acknowledge that they are related to other shortcomings in the financial system and its regulation. As a matter of fact, even if current bank regulatory reform efforts are not plainly targeting the value of implicit bank debt guarantees, respondents to the survey expected the different policy measures to rein in the value of implicit bank debt guarantees (Schich and Aydin, 2014b). Measures to make bank failure resolution more effective are considered as a crucial element of the mix of policy measures taken.

Against this background, the paper also provides some updates on developments regarding resolution regimes and practices; these affect the burden-sharing in cases of failure of financial firms, including by allocating any losses to bank owners, creditors, etc. Essentially, resolution practices determine the ex-post value of the implicit guarantee that creditors perceived ex ante to exist. These practices together with the resolution regimes that are currently being put in place shape expectations about future public support for the debt of financial firms and hence the value of implicit bank debt guarantees.

II. Some indirect evidence regarding the beneficiaries of implicit bank debt guarantees

Methodological approach and main findings

The effect of a guarantee on risky bank debt is to mitigate the risk, essentially transferring it from the creditor to the guarantor. Explicit and implicit guarantees are similar in that regard, although the effect of the latter crucially depends on the strength of the belief that the guarantee exists. The extent to which the creditor benefits from the guarantee depends on the creditor's risk preferences and the pricing of the guarantee, that is in particular the extent to which the creditor accepts a lowering of the nominal return in exchange for the belief that the debt is backed by an implicit guarantee. The guarantor essentially subsidises the funding costs of the bank, while receiving no financial compensation from the beneficiary, except potentially some indirect compensation in the sense that the achievement of the policy goal of financial stability may be facilitated. But to whom does this subsidy value accrue: creditors or owners of banks? Their customers or employees? Other stakeholders?

Bank creditors, that is depositors and investors in other forms of debt of financial institutions, are the direct beneficiaries of implicit bank debt guarantees. But they may capture only a part of the benefits. As a matter of fact, implicit guarantees reduce the funding costs of banks, and how this advantage benefits the various stakeholders in the success of the bank is not clear a priori. Benefits may flow to the banks' owners, their customers, their employees or other stakeholders.

This section provides a framework for organising the discussion about the potential beneficiaries of implicit bank debt guarantees and the relative importance of benefits flowing to different stakeholders. It also presents empirical evidence that some bank stakeholders obtain rents (i.e. receive payments or pay prices the social costs of which exceed the private

costs), which would be consistent with the existence of implicit guarantees. In doing so, it puts a particular focus on the place of the bank stakeholders in the overall income distribution. Such a focus helps shed some light on the question as to whether the value of implicit guarantees is more likely to accrue to the relatively worse- or better-off in society.

The main empirical findings are:

- Banks have lent too much to households and non-financial corporations, on average over the long term in the OECD. Bank lending is a key ingredient of modern economies and strongly contributes to economic growth, but above a certain threshold bank lending becomes excessive so that expanding it further hurts growth.⁴ This observation is consistent with the view that implicit guarantees for bank debt, lowering the funding costs of banking activities, have led to an excessive increase in such activities.
- Credit is more unequally distributed than income across households (Denk and Cazenave-Lacroutz, 2015). To the extent that implicit guarantees imply more and cheaper bank lending to households, such additional lending is therefore likely to be allocated more to high-income than lower-income households. Thus, assuming that implicit guarantees encourage credit excesses, they tend to exacerbate income inequality.
- Financial sector employees earn more than what typically corresponds to their profile in terms of age, education and other relevant observable characteristics (Denk et al., 2015). The existence of these so-called “financial sector wage premia” is consistent with the view that bank employees benefit from the presence of implicit guarantees.
- Financial sector employees are especially prominent at the upper end of the overall population’s income distribution, and financial sector wage premia are particularly large for the top earners (Denk et al., 2015). These results are based on econometric investigations using data for 8 million employees from most economic sectors. Wage premia in the financial sector are estimated from differentials in labour income compared with other sectors controlling for a wide array of factors (such as age, education or experience).⁵ Hence, to the extent that implicit bank debt guarantees have encouraged higher financial sector pay, these guarantees have raised income inequality.⁶

These findings indicate that credit overexpansion has been facilitated by too cheap borrowing and that implicit bank debt guarantees have played a significant role in this process. They are also consistent with the view that at least some of the benefits of implicit bank debt guarantees flow to bank stakeholders other than the banks’ creditors, namely their employees and debtors, and that implicit guarantees tend to benefit more the well-off, thus reinforcing rather than reducing income inequality.

Bank creditors

Implicit guarantees directly protect the creditors of banks, reducing the credit risk exposure of these counterparties. As the guarantee is only perceived, no premium is charged in exchange, at least not directly and openly. While the guarantee is typically essentially free, it nonetheless has value and creates economic costs, including through its effect on the incentives of the creditors, other stakeholders of banks and banks themselves. Bank creditors include depositors, senior unsecured creditors and subordinated creditors. As long as they are exposed to the risk of loss (or delayed access to funds), they can be expected to impose market discipline on their debtor.⁷ As previous discussions by the CMF concluded, the under-pricing of guarantees, however, tends to limit the role of market discipline and give rise to moral hazard.

Among the above-mentioned types of creditors, the perception that their claims benefit from an effective government guarantee is probably strongest for insured depositors, even if the insurance arrangement is a private one, but, more remarkably, also for uninsured depositors. For example, the comprehensive database of deposit insurance arrangements established by Demirgüç-Kunt et al. (2014) distinguishes between explicit and implicit deposit insurance arrangements. Where deposit insurance arrangements are explicit, the database provides additional information on design characteristics, such as management, coverage or funding. Where no explicit deposit insurance coverage exists, coverage is assumed to be implicit; the authors succinctly explain: “Indeed, implicit coverage always exists, regardless of the level of explicit coverage.” This assessment reflects the historical record, which includes very few examples where uninsured depositors and even fewer examples where insured depositors have incurred losses as part of bank failure resolution cases.

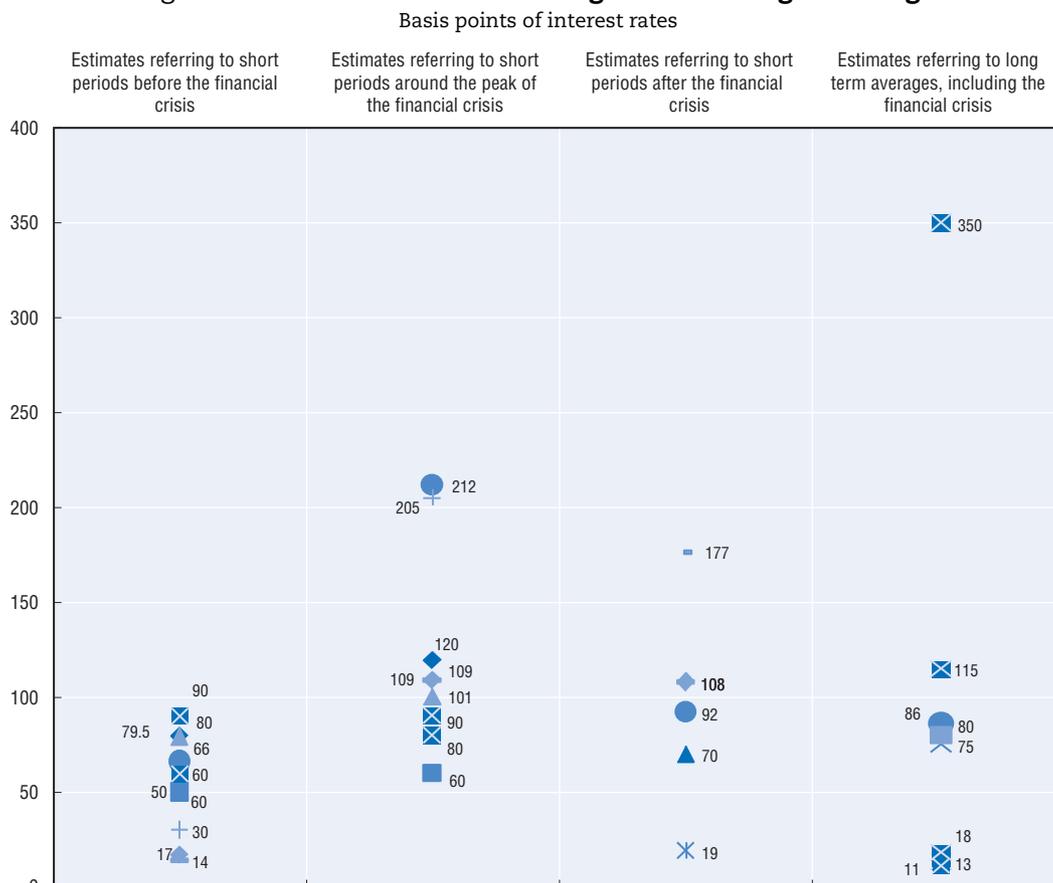
While there may be a perception that governments always stand behind deposit insurance arrangements, the European Free Trade Association Court (2013), for example, decided that there is no obligation for public authorities to backstop *private* deposit insurance regimes whenever their funding turns out to be insufficient to cover the amounts of deposits insured. But as a matter of general practice, deposits seem to be *de facto* benefiting from special protection, as they are generally exempt from the burden-sharing associated with bank failure resolution, with the notable recent exception of Cyprus.⁸ For example, even in the United States, where the Federal Deposit Insurance Corporation (FDIC) does inflict losses on shareholders and subordinated creditors as a general rule and expects creditors, uninsured depositors and itself to take losses as part of failure resolutions (see e.g. Bennett et al., 2014), the FDIC favours “purchase and assumptions” resolutions that keep depositors fully protected. CMF discussions highlighted that this situation, however, is likely to evolve as a result of the new failure resolution instruments available as part of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Senior unsecured creditors and often even subordinated creditors also benefit from implicit guarantees, which is problematic as these types of creditors would be expected to be a helpful source of bank monitoring and disciplining the risk-taking of banks. Unfortunately, the most recent historical record may, however, have reinforced the perception that holders of unsecured bank debt benefit from implicit guarantees; events where they incur losses have been rare and typically occurred in the context of the failures of rather small banks (see also Section III).

Measuring the value of implicit bank debt guarantees is notoriously difficult, especially given the uncertainty about the types of liabilities covered⁹ and the extent to which support might be forthcoming. The estimates collected through the OECD/CMF Survey on implicit bank debt guarantees suggest, however, that the value of implicit guarantees is substantial, whatever method is used. Figure 1 shows a summary of empirical estimates for funding cost advantages in basis points of interest rates. These funding cost advantages can amount to the equivalent of around 1% of GDP and in a crisis situation even up to 3% of GDP. While several recent studies suggest that the funding cost advantages for banks may have become close to zero in some countries, a large majority of the empirical literature indicates that implicit bank debt guarantees persist.

Other stakeholders in the success of a bank may also benefit from the perception of an implicit bank debt guarantee. The remainder of this section singles out selected groups of stakeholders for special attention. Figure 2 visualises these potential beneficiaries in a

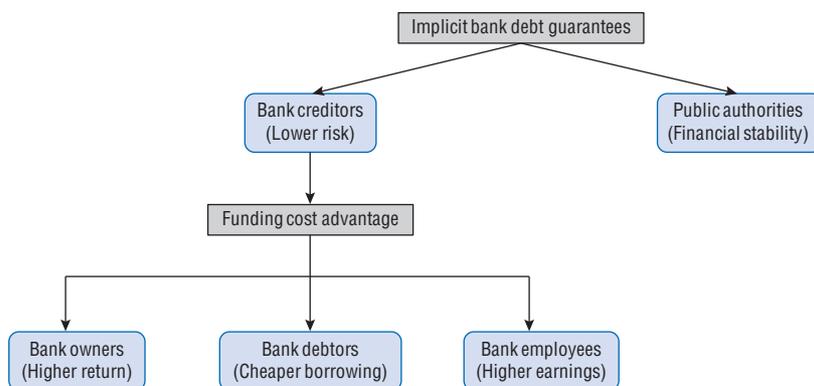
Figure 1. **Most estimates of funding cost advantages are high**



Note: Funding cost advantage in basis points, based on the results of the empirical studies collected and received as part of the responses to the OECD/CMF Survey on implicit guarantees for bank debt. Symbols refer to different countries and for some countries more than one estimate is available. The underlying assumptions and samples differ across countries and individual studies. Midpoint 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 average sensitivity of interest rates to credit ratings during the year specified, as estimated in Schich et al. (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 guarantees for bank debt (Schich and Aydin, 2014a).

Figure 2. **Many stakeholders potentially benefit from implicit bank debt guarantees**



simplified manner. Depositors with the bank and the bank's other creditors may benefit directly from implicit guarantees due to the lower risk they are exposed to (as long as the guarantee is not unexpectedly withdrawn), while other stakeholders may benefit indirectly. As suggested by the CMF discussion of this paper, implicit bank debt guarantees may, in addition, help public authorities attain their objective of financial stability in crisis times. Such benefits are less likely to be present in the long run, and may then even turn into costs, for example in cases where implicit guarantees contribute to credit bubbles. An analysis of these considerations pertaining to public authorities is, however, outside the scope of the present paper, and the issue is left for future work.

Bank owners

The consequence of overly low borrowing costs to banks due to implicit debt guarantees is that debt finance is under-priced relative to a situation without implicit guarantees. This interpretation is in line with the observation that banks are very heavily leveraged, i.e. have a disproportionately small part of their liabilities funded by equity compared with other corporations.¹⁰ The high leverage has the benefit for the owners of the bank of raising the rate of return on the bank's equity and maximising the value of the guarantee.

The present paper focuses on the perceived guarantee of bank debt, but it is not unreasonable to assume that the perceived protection of the bank's liabilities goes further and includes at least part of its equity. In particular, there might be the perception that the guarantee pertains to the survival of the bank in its present form, which would imply that not just debtors but also shareholders would be directly perceived to be protected, at least to some extent. While the policy response to the global financial crisis has often involved the dilution or even wipe-out of shareholders as part of bank failure resolutions, this was not the outcome in every case. Policy-makers and supervisors may have been inclined to avoid a total wipe-out, and this situation might confer shareholders with an added benefit, which is likely to reinforce the tendency to raise leverage to increase returns (in good times).

The share of financial companies in total stock market capitalisation has increased based on various broad indices, such as the S&P 500 or the Stoxx Europe 600 (OECD, 2014), although this pattern has reversed in some cases after the global financial crisis. This is consistent with the view that bank shareholders have fared at least as well as shareholders in other companies. Unfortunately, data on the identity of bank shareholders has not been available for the purpose of this paper. Analysis of recent euro-area household-level data by Denk and Cazenave-Lacroutz (2015) shows, however, that stock market participation and, even more so, stock market wealth are very unequally distributed across households in different income groups.¹¹ Averaged across the twelve euro area countries in the sample, the top 20% earning households hold two thirds of all stock market wealth in the economy, reflecting a much larger concentration of household wealth than household income. Unless bank stocks are distributed a lot more equally than overall stock market wealth, the higher rate of return on bank equity as a result of implicit bank debt guarantees benefits primarily investors at the top of the income and wealth distribution.

Besides the private sector, governments in several OECD countries are large equity holders of banks. Hence, some of the costs to taxpayers from implicit bank debt guarantees possibly flow back to the public authorities via higher rates of return on their holdings of bank equity. No attempt has been undertaken to empirically quantify the size of this circular flow from public authorities to banks and back to public authorities. In any case, implicit bank debt guarantees should be reined in, even if part of the associated benefits

were to some extent passed back to the public authorities. They still tend to encourage banks to raise their leverage, and governments have a mixed track record as bank owners.

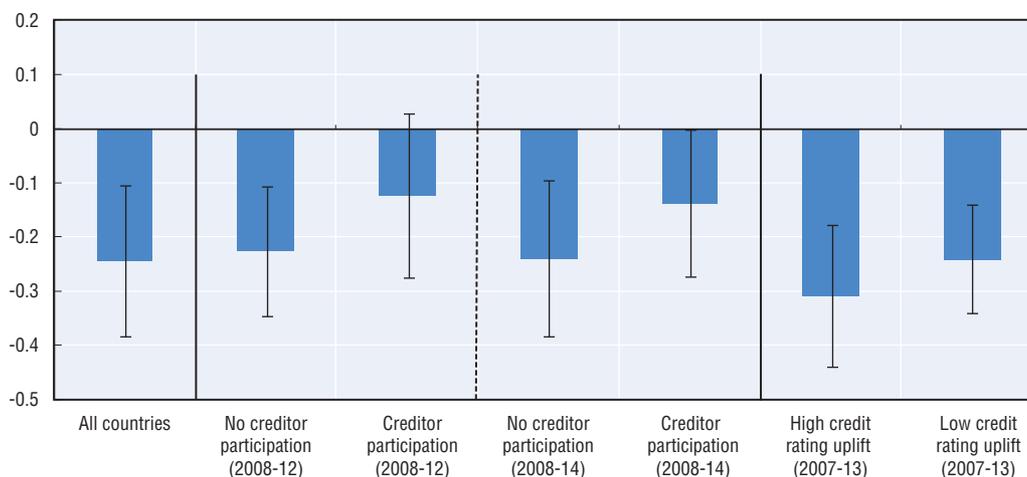
Bank debtors

Part of the benefits from implicit bank debt guarantees may flow to households and non-financial firms taking out a loan from a bank. This mechanism is likely to be particularly important when competition between banks for private-sector lending is strong. It would lower interest rates on loans, which in turn would likely increase the overall amount of credit in the economy.

To examine the empirical relevance of this mechanism, regressions have been run relating economic growth to bank credit, defined as credit to the non-financial private sector by deposit money banks, relative to GDP in a sample of 34 OECD countries. The regression specification includes standard growth determinants identified by previous empirical studies (Mankiw et al., 1992; Caselli et al., 1996; Arnold et al., 2011).¹² Its results suggest a tight association between more bank credit and lower GDP growth (Figure 3; Column 1 in Table 1 of Appendix).¹³ Related OECD work (Cournède and Denk, 2015) shows that this negative link is stronger for bank credit than non-bank credit, in line with other recent empirical evidence showing that market-based financial systems are more conducive to growth and innovation than bank-based ones (European Systemic Risk Board, 2014; Gambacorta et al.,

Figure 3. **Implicit bank debt guarantees influence the relationship between bank credit and GDP growth**

Percentage point change in real GDP per capita growth associated with an increase in bank credit by 10% of GDP



Note: The figure shows econometric estimates of the association of an increase in bank credit with GDP growth, controlling for a wide range of factors. The point estimates are surrounded by 90% confidence intervals. The bar for “All countries” uses more data than the decompositions by the participation of bondholders in the loss-sharing of banks during the reference period (“No creditor participation” and “Creditor participation”) and the average credit rating uplift during 2007-13 (“High” and “Low credit rating uplift”). The estimates should therefore not be viewed as a weighted average. The specification regresses real GDP growth per capita on bank credit to the non-financial private sector divided by GDP, gross fixed capital formation divided by GDP, average years of schooling in the adult population, the growth rate of the working age population, country fixed effects, year fixed effects and country-specific linear time trends. Table 1 of Appendix provides the coefficients on the control variables and other statistics. The empirical framework builds on Cournède and Denk (2015). In contrast to that work, the focus of the analysis here is on private credit by deposit money banks (not private credit by all financial institutions) and the role of implicit bank debt guarantees.

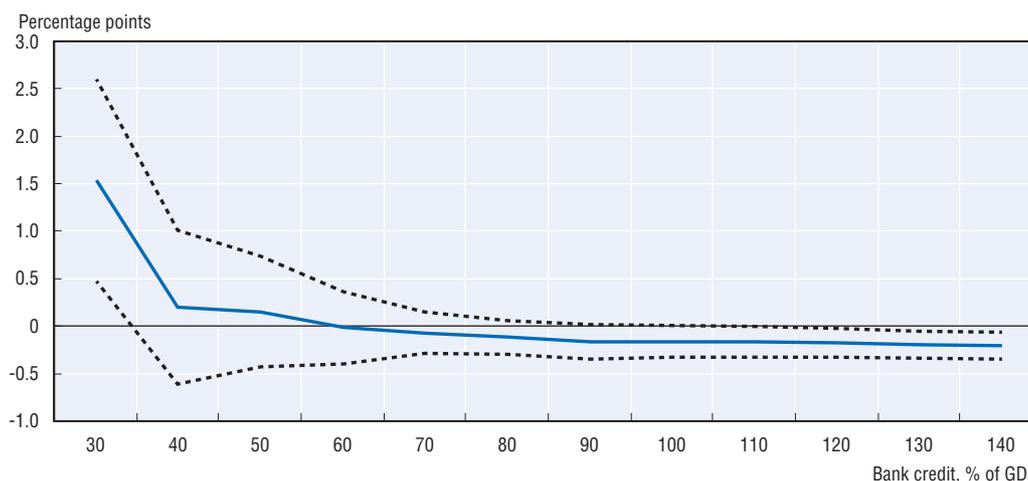
Source: OECD Secretariat calculations using World Bank Global Financial Development database; Bank for International Settlements credit series; Schich and Kim (2012); OECD Secretariat update from Schich and Kim (2012) using data publicly available from Moody’s website; OECD Secretariat update from Schich and Lindh (2012) using Bloomberg and SNL; World Bank World Development Indicators database; OECD Economic Outlook database; Barro and Lee (2013).

2014; Hsu et al., 2014). These results leave questions open regarding the detailed channels that link more credit to lower growth, but they are consistent with the hypothesis that a part of implicit bank debt guarantees manifests itself in overly low borrowing costs and too high levels of bank lending.

The estimated negative link between an increase in bank lending and growth applies to the average OECD country at the historically observed levels of bank credit. Even in the presence of implicit bank debt guarantees, one would expect, however, that some bank lending is growth-promoting and that only after a certain level is reached bank credit becomes associated with lower growth. This is precisely the pattern observed in the data when the econometric approach developed in Cournède and Denk (2015) for credit held by all financial institutions (i.e. not only banks) is applied to bank credit. Multiple regressions are run consecutively including observations with higher levels of bank credit (Figure 4). Along the horizontal axis the number of observations and also the average level of bank credit increase. As bank credit increases, the point estimate converges to the average estimate identified in Figure 3. Looking at sub-sample results, a rise in credit when credit is 30% of GDP is linked with sharply higher growth, statistically significant at the 10% level. However, this relationship quickly becomes much smaller and then negative, so that a credit increase when credit is 110% of GDP is associated with a reduction in economic growth, in a statistically significant fashion. In 2011, bank credit exceeded 110% of GDP in sixteen of the 34 OECD countries. These results are broadly in line with other recent research (Arcand et al., 2012; Cecchetti and Kharroubi, 2012; Beck et al., 2014; Law and Singh, 2014).

Figure 4. The association between bank credit and GDP growth turns from positive to negative as bank credit increases

Estimated change in per capita GDP growth when bank credit increases by 10% of GDP



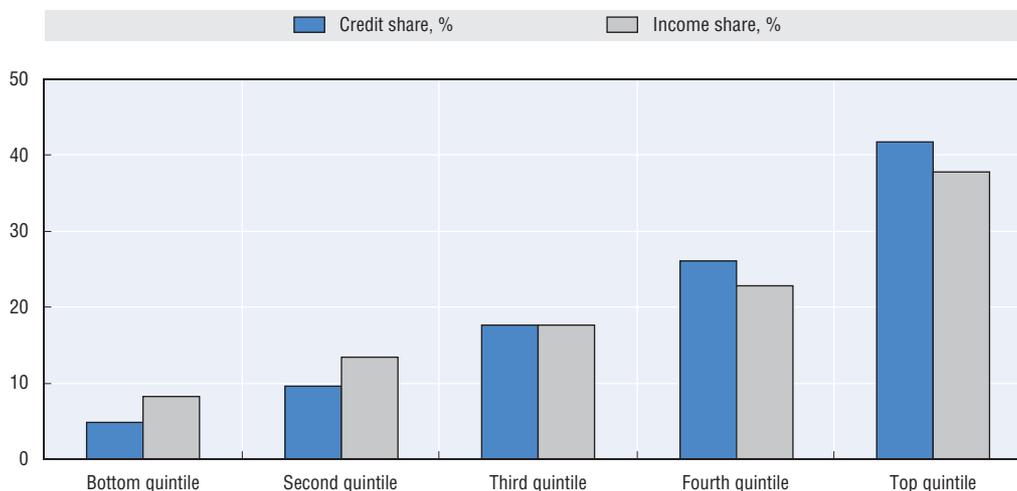
Note: The figure shows how the empirical association of GDP growth with bank credit varies depending on the ratio of bank credit to GDP. Bank credit is credit to the non-financial private sector by deposit money banks. Estimates are obtained by consecutively including observations with higher levels of bank credit in a regression of real GDP growth per capita on bank credit, gross fixed capital formation divided by GDP, average years of schooling in the adult population, the growth rate of the working age population, the logarithm of the lagged level of real GDP, country fixed effects and year fixed effects. The dotted lines represent the 90% confidence band. The sample covers all OECD countries. The empirical framework is based on the approach developed in Cournède and Denk (2015) who present the approach in detail. In contrast to that work, the focus of the analysis here is on private credit by deposit money banks (not private credit by all financial institutions).

Source: OECD Secretariat calculations using World Bank Global Financial Development database; Bank for International Settlements credit series; World Bank World Development Indicators database; OECD *Economic Outlook database*; Barro and Lee (2013).

The benefits from the expansion of credit triggered by lower borrowing costs as a result of implicit guarantees may accrue unequally to people across the income distribution. The sharing of the benefits depends on whether the implied interest rate reduction differs across income groups, and it depends on how much debt the different income groups have. Analysis of recent euro-area household-level data by Denk and Cazenave-Lacroutz (2015) documents that low- and middle-income households on average do not pay higher interest rates than high-income households.¹⁴ It also shows, however, that the distribution of household credit is more unequal than the distribution of household disposable income: while the middle 20% earners have about 18% of both total income and credit, the credit share of the bottom 20% is lower than their income share, and the opposite holds for the top 20% (Figure 5). Consequently, the likely benefits of implicit bank debt guarantees in the form of reduced borrowing costs accrue disproportionately to high-income households. This unequal sharing of benefits widens the distribution of income, consumption and wealth.

Figure 5. **Household credit is more unequally distributed than income**

Euro area countries, 2010



Note: Credit share is total household credit of an income quintile divided by total household credit of all income quintiles. Income share is total annual household disposable income of the income quintile divided by total annual household disposable income of all income quintiles. Income quintiles are based on annual household gross income for household credit and on disposable income for household income. The figure depicts the simple average of OECD countries which belong to the euro area and for which data are available.

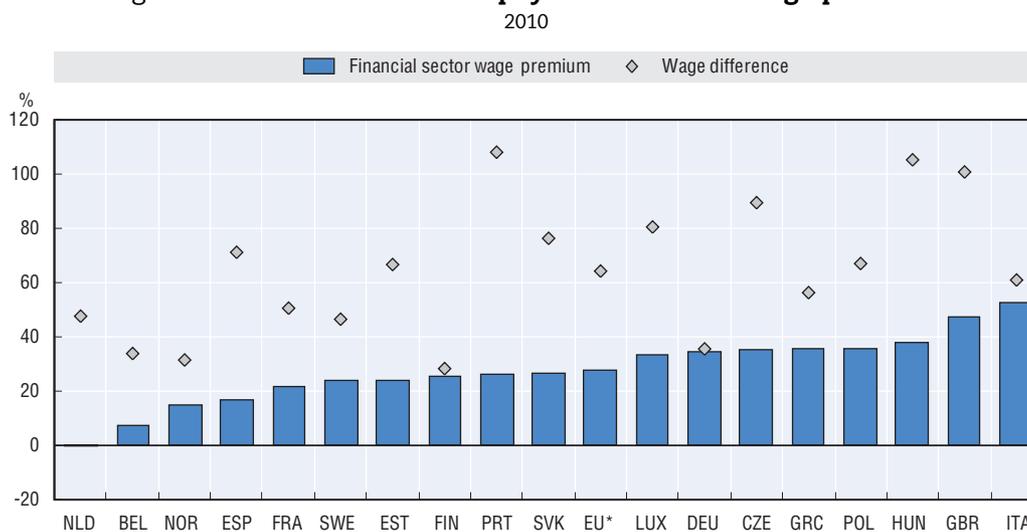
Source: Eurosystem Household Finance and Consumption Survey; OECD *Income Distribution and Poverty database* (Denk and Cazenave-Lacroutz, 2015).

Besides private-sector debt, banks also hold significant amounts of government bonds and other government debt, at least in some OECD countries. If some of the funding cost advantage of banks is passed through to their own debtors in the form of lower interest rates being charged by banks, this is another channel through which implicit bank debt guarantees can flow back to public authorities. Such a circular flow of funds should nonetheless be avoided by public authorities, given the various other costs of implicit guarantees discussed here and in related work. It can also create a vicious spiral between bank and government solvency risk, which can hurt both parties in times of stress, as the recent euro area crisis has amply demonstrated.

Bank employees

Bank employees make up another group of stakeholders who may indirectly benefit from the funding cost advantage created by implicit bank debt guarantees. Related OECD work (Denk et al., 2015), using data on 8 million employees in EU countries, finds that financial sector employees are concentrated in the upper end of the labour income distribution and especially in its top decile.¹⁵ Earnings, including wages and bonuses, are found to be on average 65% higher in finance than elsewhere. Two potential channels can explain the high level of financial sector pay: i) the profile of financial sector employees in terms of education, age, experience, etc., and ii) wage premia that raise wages above the compensation levels usually associated with such profiles. Regressions have been run to examine the degree to which education, age, experience and an extensive list of other relevant observable characteristics can explain wages.¹⁶ This investigation shows that financial sector employees on average earn 28% more than their education, experience and other characteristics usually warrant in other sectors (Figure 6). Observable characteristics thus explain little more than half of the pay difference between finance and other sectors. These wage premium estimates are broadly in line with those obtained by others (Du Caju et al., 2010; Magda et al., 2011; Martins, 2004).

Figure 6. **The financial sector pays a substantial wage premium**



Note: The wage difference is the difference between pay in finance and elsewhere. The wage premium estimates how much of this difference cannot be explained by observable characteristics of financial sector employees such as education or experience. More precisely, the wage difference is the percentage by which gross annual earnings of weighted full-time full-year equivalent employees in finance exceed those in other sectors. The financial sector wage premium is obtained from regressions of the log wage on age, gender, highest level of education, years of experience in the firm and their square, employees in the firm, geographical location of the firm, type of financial control, level of wage bargaining, type of employment contract, number of overtime hours paid and occupation. The average wage difference in the raw data of 65% is 6 percentage points larger than when the wage difference is estimated with the logarithmic specification of the wage regression. EU* is the simple average of OECD countries which belong to the European Economic Area and for which data are available. Data for Germany relate to 2006. The coverage of sectors is not exactly the same for all countries, and the sample size varies considerably across countries.

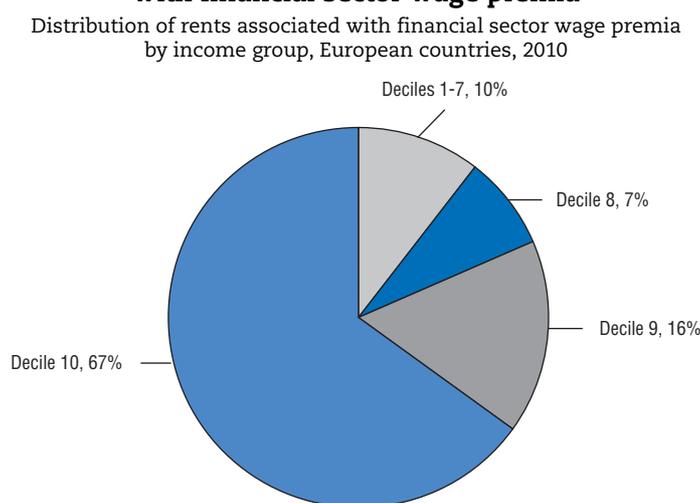
Source: Eurostat Structure of Earnings Survey (Denk et al., 2015).

Financial sector wage premia are consistent with the hypothesis that bank employees receive some of the benefits from implicit bank debt guarantees. Their share in such benefits is likely to be larger when they have more bargaining power vis-à-vis the bank, their employer, and when labour market imperfections exist in the financial sector. The

details of such institutional determinants of financial sector wage premia are beyond the scope of the present paper. The discussions by the CMF of this paper suggest that earnings outcomes are also likely to reflect little competition among banks. Stronger competition would make it more difficult for bank managers to retain the value of implicit bank debt guarantees.

Another issue relates to the distribution of these rents across the income distribution. For one, high-income financial sector earners gain more in absolute amounts for the same percentage-point wage premium. In addition, Denk et al. (2015) show that financial sector wage premia (in percentage points) are larger for higher income groups, reaching 40% for the top 10% in the overall income distribution. Also, more financial sector employees are present among the high-income earners. Estimations that account for these factors indicate that the bottom seven deciles receive very little of the rents (Figure 7). The bottom five deciles receive essentially no rents. By contrast, two-thirds of the rents go to the top 10%. The country-specific data convey a broadly similar picture to the aggregate in the figure. This evidence suggests that, insofar as implicit guarantees contribute to financial sector wage premia, their benefits accrue primarily to financial sector workers at the top of the income distribution.

Figure 7. Top earners capture most of the economic rent associated with financial sector wage premia



Note: The figure shows how the rents associated with wage premia are distributed among financial sector employees depending on their income level. For each employee, the rent is defined as the share of her labour earnings that cannot be explained by her observable characteristics such as age, experience etc. The rents to financial sector employees in a particular income decile are the sum of all individual-specific rents in this decile. The figure depicts the simple average of OECD countries which belong to the European Economic Area and for which data are available. Data for Germany relate to 2006. To exclude working time effects on earnings, the sample is confined to full-time, full-year equivalent employees. The coverage of sectors is not exactly the same for all countries, and the sample size varies considerably across countries.

Source: Eurostat Structure of Earnings Survey (Denk et al., 2015).

There is some indirect evidence of a link between implicit guarantees and financial sector wage premia. In particular, if implicit guarantees are in part channelled to the banks' debtors and their employees, one would expect a positive correlation between credit and financial sector wage premia. Empirical evidence indicates that this is indeed the case: credit grows as wage premia become larger (Cournède and Denk, 2015).

Two other mechanisms could link implicit bank debt guarantees with the financial sector labour market: i) implicit guarantees may lead to over-employment in the sector, and ii) over-skilling may allow financial sector workers to benefit from relatively less demanding job requirements. Regression analysis suggests that wage premia are negatively related with employment in finance, which is inconsistent with the first mechanism being at work. By contrast, data from the OECD Survey of Adult Skills (PIAAC) provide tentative evidence that financial sector workers are more likely to be over-skilled than those working elsewhere, even if the size of the difference with other sectors is small (Denk et al., 2015).

Other stakeholders

Other parties involved in banking may also extract benefits from implicit bank debt guarantees. For example, firms in which banks have ownership stakes may experience more stable funding and a higher asset valuation as a result of higher demand for their equity. Also, the suppliers of inputs to banks may receive above-market prices, for example, for the selling of IT equipment or office infrastructure. Or buyers of financial services may have to pay lower fees to financial intermediaries for the services they provide related with, for instance, trading, wealth management or securitisation. As well, swaps and derivatives counterparties may share in the reduced funding costs of banks, and these advantages could add to the benefits arising for swap and derivatives counterparties from their privileged bankruptcy status relative to other credit instruments in several jurisdictions. This super-senior status is often referred to as an explanation for the phenomenal growth of derivatives outstanding until the beginning of the global financial crisis, and the effect of that status may have been reinforced by the presence of implicit guarantees on bank debt. Analysing whether these various other stakeholders and counterparties of banks materially benefit from implicit subsidies is outside the scope of this paper and remains a matter for future research at this stage.

III. The policy response: Facilitating smooth and effective resolution of financial firms

Bank regulatory reform measures

Supporting distressed large banks and their creditors using taxpayer funds has been recognised as undesirable for some time now, but the historical record is nonetheless rich with such examples. Decisions to deny support to struggling large banks are extremely rare in many jurisdictions. The former course of action is often chosen, as in the midst of episodes of heightened financial distress and uncertainty it is probably the best understood option to stabilise the system and avoid widespread economic damage. Alternatives seem either unavailable or are untested. This situation faced by public authorities is well understood by the counterparties of banks, which regard bank debt as “special”, benefiting from an extra layer of support. The policy actions taken in response to the recent global financial crisis have likely further entrenched this perception (Schich, 2013).

Thus, as succinctly put in the July 2014 interim report of the Financial System Inquiry in Australia,¹⁷ the challenge for policy-makers now is to alter these beliefs. In this regard, governments have announced their intentions to rein in the value of implicit bank debt guarantees. And they are taking measures to make it more likely, or more credible, that they can impose losses on creditors.

In fact, while there is no single measure that can serve as a silver bullet capable of eliminating on its own the perception that bank debt is special, efforts to make resolution

more effective are probably key in this regard. As highlighted by the responses to the OECD/CMF Survey on implicit bank debt guarantees, while current bank regulatory reform is not plainly targeting the value of implicit guarantees, the various measures taken together are expected to rein in their value. Rather than a single measure, a mix of different measures is considered as holding the greatest promise, with each measure of that mix contributing to the strengthening of the likelihood and the credibility of orderly bank failure resolution with minimal taxpayer support, thus lowering the perceptions of an implicit guarantee. Elements of that mix include in particular the implementation of internationally agreed capital and liquidity standards, the tightening of micro- and macro-prudential supervision and efforts to making bank failure resolution more effective.

Dealing effectively with bank failure

The overarching target of bank regulatory reform is not to eliminate the risk of bank failure but to reduce systemic risk to a minimum acceptable level. Failure risk is hard to completely eliminate, and its elimination is not even desirable as the possibility of failure is part of the efficient functioning of the financial sector. The ability of successful financial firms to grow and the possibility for inefficient ones to fail are two key features of healthy competition.

When a bank fails, external financing of resolution can be avoided as long as some stakeholders of the bank take losses, with bank shareholders and then its unsecured creditors expected to be first in line. In practice, the issue of allocating losses in an orderly manner is not straightforward, however, and more challenging than in the case of failure of non-financial corporates. Banks supply some critical services that they may need to continue to provide even after failing (or that would have to be provided by other or newly formed entities). The franchise value of a bank can deteriorate rapidly; the values of the asset and liability side of bank balance sheets are closely linked and a fall in confidence can occur and bring down the value of a bank quickly, in which case some critical services would not be available anymore. Hence, speed in the process of resolution is of the essence. Moreover, banks are interlinked with each other, and losses by counterparties of one bank can lead to contagion, either through direct links or because counterparties assume that similar weaknesses are present in other banks, potentially resulting in the materialisation of systemic risk.

Strengthening the capacity to impose losses on bank creditors

Imposing losses on bank creditors is challenging. In this financial crisis, for instance, many instruments intended to absorb losses once capital is depleted, such as especially subordinated debt, were not allowed to fulfil their purpose. Support in form of new equity or loans was provided in many instances of bank failure, effectively eliminating the need to fund resolution or restructure internally through the imposition of losses on subordinated debt. In many cases, subordinated debt holders were bailed out. And even where haircuts to these claims were included as part of the conditions for public support, the extent of the losses was not commensurate with market price valuations at the time. The support often extended implied recoveries for the claims in market value terms that exceeded the haircuts imposed on them as part of the support packages.

As discussed by the CMF on a previous occasion, senior creditors and even subordinated creditors were typically spared from the burden-sharing associated with bank failures during the past few years. This observation is remarkable given that a global financial crisis of the magnitude and intensity just witnessed would be expected to be reflected in

significant losses of many stakeholders, including bank creditors. The need to be able to impose losses on unsecured and uninsured creditors has been recognised; one example (Australian Treasury, 2014a) says:

“Introducing credible ways to impose losses on creditors in the event of failure assists in achieving orderly resolution with minimal use of taxpayer funds. This goes some way to addressing perceptions that some institutions have an implicit guarantee by reducing expectations of Government support, and encouraging investors to pay greater attention to risk.”

Considerable progress has been made regarding the refinement of bank failure resolution regimes, although Financial Stability Board (FSB) discussions and IMF monitoring of progress suggest that further substantial work by FSB members is required on the implementation of effective resolution regimes. In fact, few jurisdictions have bank failure resolution regimes that are fully aligned with the FSB Key Attributes of Effective Resolution Regimes. In particular, many FSB members have not yet adopted bail-in powers or mechanisms to give effect to foreign resolution actions or recovery and resolution planning for all systemic domestically-incorporated banks. Also, discussions within the FSB conclude that further cross-border cooperation is needed to overcome obstacles to the implementation of effective resolution regimes.¹⁸

Practices matter: Involving unsecured creditors

Progress in refining resolution regimes made so far is already reflected in rating agencies' decisions to revise downwards the outlook for banks in several jurisdictions, especially in those affected by the European Bank Recovery and Resolution Directive and the Single Resolution Mechanism. Rating agencies explicitly note that these developments make it less likely that public support for the debt of banks is coming forward, even if they do not foresee reducing the assumption of government support for bank debt to zero. One recent empirical study suggests that the funding cost advantage for large compared with small bank holding companies with the same default risk in the United States may have become insignificantly different from zero (Lester and Kumar, 2014), although the extent to which the results are robust to changes in the assumptions made regarding the estimation of credit default risk is not clear.

Resolution practices matter and, as documented by previous CMF work (Schich and Kim, 2012), where creditor losses occurred, there is clear evidence of a decline in implicit bank debt guarantees, especially but not exclusively in the case of smaller banks. In fact, in countries where legal changes were made to establish more effective resolution regimes and where, subsequently, actual failure resolutions involved losses on the part of at least some holders of unsecured bank debt, noticeable declines in the value of implicit guarantees were observed. Such cases remain isolated: many jurisdictions have experienced none.

Are recent bank failure resolution practices reflecting more fundamental attitudes towards failure?

Implications for the relationship between finance and growth

Failure is difficult to accept, which explains why it often proves so difficult to impose losses on investors in bank failure cases. While this broad statement has some general relevance, there are important differences across countries in the extent to which failure is considered part of economic activity and risk-taking. For example, while bank failure

resolutions often occur in the United States, such cases tend to be rare in many Continental European countries. These differences may reflect some fundamental differences in attitudes towards failure and risk-taking, which in turn might affect the relationship between finance and real economic growth.

Characterising countries by their experience with creditor involvement in burden-sharing

To shed some light on this issue, the recent bank failure resolution experience is used to classify countries into two groups: one where bank failures have occurred and unsecured creditors have incurred losses as part of failure resolution and another one where unsecured creditors have not incurred any losses between 2008 and the first half of 2012 (see Figure 7 in Schich and Kim, 2012). Over this time period, bank failures involving the participation of unsecured creditors in the resolution process occurred in six of the 21 OECD countries studied: Denmark, Greece, Iceland, Ireland, the United Kingdom and the United States. Of course, a situation in which there are no creditor losses could reflect either that i) bank failures are handled without involving creditors or that ii) there are no failures whatsoever because banks are resilient or not exposed to shocks.

The data indicate that the long-term association between bank credit and GDP growth is more negative in countries where bank creditors have not been exposed to bank losses during the global financial crisis. The identical regressions as in section II are re-run allowing for different coefficients on bank credit to the non-financial sector for the two groups. Bank credit in countries where bondholders have not participated in bank losses has a coefficient that is nearly twice as large (in absolute value) as the one for the other countries and only the one for the no-participation countries is statistically significant at conventional levels (Figure 3; Column 2 in Table 1 of Appendix). The two coefficients are, however, not different from each other in a statistically significant fashion.

Countries enter one group or another depending on the treatment of bank creditors during the global financial crisis, while the link with growth is estimated over the past five decades. This discrepancy represents a caveat, which is related to the availability of data. However, the very low frequency of deep banking crises in OECD countries means that the global financial crisis can be interpreted as an episode that manifested the relative size of previously underlying guarantees. This interpretation implicitly assumes that creditors correctly evaluated the nature of underlying guarantees.

The data used for classifying countries are taken from Schich and Kim (2012) and hence refer to the period until 2012, which is when the CMF had discussed the issue of resolution practices. As it turns out, since these discussions, the six countries already identified as countries in which unsecured bank creditors incurred losses during the recent crisis are now being joined by Austria, the Netherlands and Portugal as the reference period is extended to include the years from 2008 to 2014. When these three countries are grouped with the other six in the regression, the coefficient of interest is still nearly twice as large for the countries with no participation of bank creditors in resolution as for the others (Figure 3; Column 3 in Table 1 of Appendix). The estimate for the participation countries is now also statistically significant at the 10% level, reflecting the increase in the number of observations for this group. This suggests that the core result of a less negative long-term link between bank credit and GDP growth for countries that have involved bank creditors in bank resolution since 2008 is not sensitive to when the exact boundary between the two groups is drawn.

Characterising countries by the observed credit rating uplift due to assumed external support

An alternative approach to classify countries is to rely on the extent of the perception that banks benefit from implicit guarantees, using a measure of the credit rating uplift due to assumed external support (i.e. the difference between an issuers' credit rating and its intrinsic strength rating). Such an approach avoids the issue that some countries may simply not have experienced a crisis, but are grouped with countries where failure resolutions have avoided inflicting losses on unsecured creditors.¹⁹

When the average credit rating uplift is used for classification, the empirical evidence indicates that bank credit has a more negative association with GDP growth in countries where implicit bank debt guarantees are estimated to be larger. The coefficient for countries with a high rating uplift is nearly 30% more negative than the coefficient for the other countries (Figure 3; Column 4 in Table 1 of Appendix). Both coefficients are statistically different from zero, with 99.9% confidence, and they are not significantly different from each other. The result that credit has a particularly negative relationship with GDP growth in countries where implicit bank debt guarantees appear large further corroborates the hypothesis that implicit guarantees are an important factor behind the overall negative link between bank credit and growth.

Implications for policy: The need to create an environment in which banks can fail

Bank failure resolution practices were discussed at the CMF meeting in October 2012. The question was raised why so few bank failure resolution cases and creditor losses were observed, which is surprising given the intensity of the global financial crisis.²⁰ Among other things, the discussions concluded that there may be some sort of "first-mover disadvantage" when being tougher on creditors than other jurisdictions. Such a course of action can put domestic banks at a funding disadvantage compared with international peers from jurisdictions where no such stance was adopted. This view might reflect experiences such as that of Denmark in 2010: when losses were imposed on the creditors of a failing mid-sized bank, secondary market spreads for the debt of a large Danish bank compared with its Nordic peers subsequently increased.

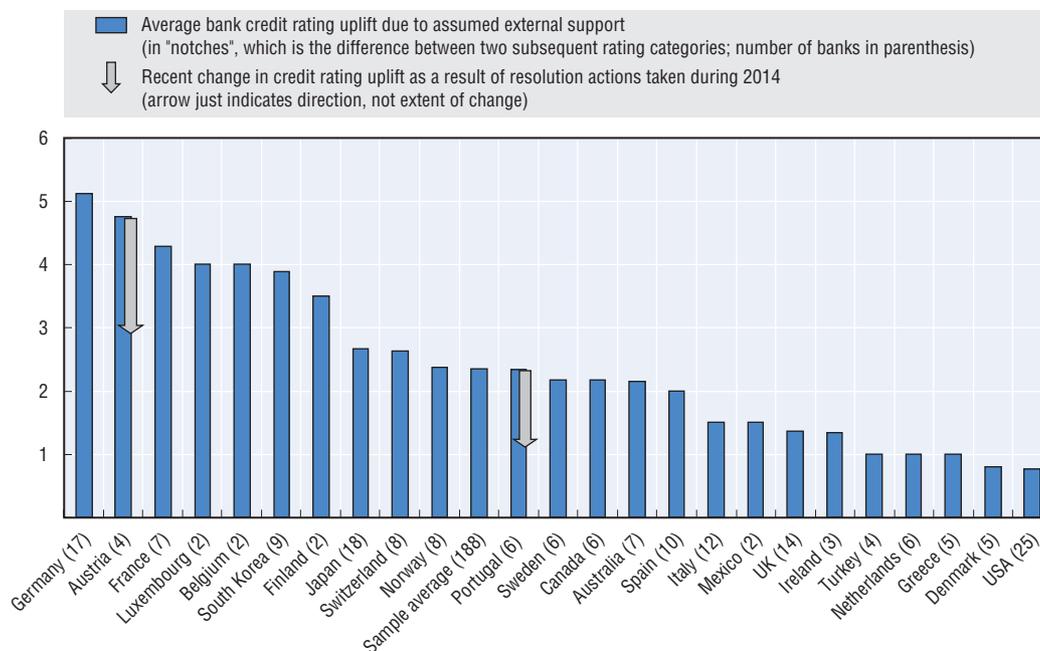
With hindsight, one lesson to draw from the experience where losses had been imposed is that such actions may have had adverse effects on domestic banks' funding conditions, compared to those of their peers in jurisdictions that were more lenient, but that it did not imply a shut-down from the funding market of any bank. Moreover, there is evidence that where losses were imposed by public authorities on bank creditors, public funding conditions improved, most likely as a result of investors appreciating that the contingent sovereign liabilities would turn out to be lower than previously anticipated. For example, demand for Danish government bonds increased after the government imposed losses on creditors of some banks, thus reducing the perception that bank liabilities might be transformed into sovereign liabilities.

More generally, market participants' expectations of further progress in making resolution regimes more effective have already been reflected in lower estimates of the value of implicit bank debt guarantees, especially in the European Union where the Bank Recovery and Resolution Directive and the Single Resolution Mechanism seem to have a bearing on expectations regarding resolution choices. Credit rating agencies regularly refer to these initiatives, although they do not expect that the new regimes will establish the

resolvability of large and complex cross-border institutions from “day one” and they continue to factor into their assessment of the credit rating of large banks the assumption that external support would be forthcoming under extraordinary circumstances.

Several rating agencies have changed their credit rating outlooks for the debt securities of many banks in the European Union and Canada, typically citing a trend towards explicit inclusion of burden-sharing with senior debt holders as a means of reducing the public cost of bank resolutions, but actual rating downgrades have been rare.²¹ The latter seem to have been concentrated on banks in jurisdictions where new resolution tools were used, involving unsecured bank creditors in the associated burden-sharing. Examples of countries where unsecured bondholders have been exposed to participation in the costs of bank failure resolution include Austria, Denmark, Greece, Iceland, Ireland, the Netherlands, Portugal, the United Kingdom and the United States. Earlier, in the cases of many banks, credit rating downgrades and pressures on credit rating uplifts typically reflected the perception that the sovereign’s strength and hence its capacity to provide for the implicit guarantees had declined. Credit rating uplifts remain strong, however (Figure 8).

Figure 8. **Bank credit rating uplifts remain strong at end 2013**



Source: OECD Secretariat update from Schich and Lindh (2012) based on data publicly available from Moody’s website.

Resolution policy actions carry an important responsibility in ensuring proper burden-sharing in cases of bank failure. These practices in turn influence expectations and behaviour of bank creditors further down the road. As it stands, credit risk is still too often socialised and this situation makes creditors too sanguine about the credit risks of banks, because they are not expected to bear the full consequences of bank failure. Rather, as a result of experiences with previous resolution cases they often assume that the sovereign will be saddled with substantial parts of the costs associated with bank failure. Effective bank failure resolution should, however, be associated with minimal, if any, taxpayer involvement; rather, resolutions should be funded internally involving equity holders and creditors. To make the

recently available resolution options credible to the counterparties of banks, governments need to be prepared to use them and plan their use. Such planning not only makes the resolution options more credible but, if properly communicated, also increases the transparency and predictability of the response by public authorities to bank failures.

V. Concluding remarks

Implicit bank debt guarantees, growth and income distribution

A well-developed financial sector is an important ingredient of healthy real activity growth. But financial expansion, for example through excesses in credit extension, can also create economic costs. Such over-lending reflecting loans with low rates of return results, among other things, from the existence of under-priced explicit or implicit bank debt guarantees. The empirical evidence discussed in this paper is consistent with the hypothesis that significant implicit bank debt guarantees have influenced incentives and behaviour of bank creditors, owners, debtors and managers.

For one, banks seem to have lent too much to households and non-financial corporations, judged by the significant negative relationship that can be observed between bank financial intermediation and real activity growth on average for OECD countries. This observation is consistent with the hypothesis that implicit guarantees for the debt of banks have made the funding of banking activities too cheap. Evidence for the relevance of implicit guarantees is provided by grouping countries, using different classification schemes, into those with high and others with low guarantees over the recent period which has revealed the extent of previously underlying public support for bank debt. The relationship of credit with growth is estimated to be systematically more negative for the country group characterised by high guarantees.

While the presence of implicit guarantees might have implied an expansion of bank lending to households, such additional lending activity is likely to have benefited higher-income households more than lower-income households. Thus, a priori, it has not reduced income inequality and probably has had the opposite effect.

The financial sector also affects measures of overall income distribution through its own compensation practices. Financial sector employees earn more than what typically corresponds to their profile in terms of age, education and other relevant observable characteristics, and this advantage increases for employees with higher incomes.

This observation of so-called “financial sector wage premia” is consistent with the view that bank employees benefit from the presence of implicit guarantees and that this effect is more pronounced, the higher the bank staff income is. Implicit guarantees thus tend to imply greater income inequality in finance and, other things equal, in the overall economy.

Policy response to reduce implicit bank debt guarantees

The discussions by the CMF in October 2014 concluded that limiting implicit guarantees should not be deemed incompatible with the maintenance of financial stability, as long as policies are properly designed and implemented. The issue of implicit guarantees may be especially critical in the context of the EU single market, where the dependency of the value of the implicit guarantee on the sovereign’s health implies a greater degree of financial fragmentation and unequal access to funding throughout the European Union. Equal access to funding of long-term investment and activities of small and medium-sized enterprises is highly desirable at the current juncture.

Looking ahead, current bank regulatory reforms are expected to rein in the value of implicit bank debt guarantees, even if not all measures target them directly. In this regard, previous CMF discussions suggest that it is useful to distinguish between measures that i) strengthen banks, ii) strengthen the capacity of public authorities to withdraw implicit guarantees and iii) directly or indirectly put a price on the “use” of implicit bank debt guarantees. Many regulatory reform measures already implemented fall into category i), while going forward, more emphasis is being placed on category ii). As part of the latter category of policy measures, more needs to be done, however, especially to facilitate the effective resolution of the failure of financial firms and their smooth exit from the market.

In fact, policy actions should ensure proper burden-sharing in cases of bank failure, respecting the hierarchy of claims on the failing institution. These practices in turn influence expectations and behaviour of bank creditors and managers further down the road. As it stands, credit risk is still too often socialised and this situation makes creditors too sanguine about the credit risks of banks, because they are not expected to bear the full consequences of bank failure. Rather, they often assume that the sovereign will be saddled with substantial costs due to a bank failure. Effective bank failure resolution should, however, be associated with minimal, if any, taxpayer involvement.

Earlier CMF work found that, where new resolution regimes have been put in place, stressing the principle of bail-in, and where unsecured creditors have incurred losses as part of bank failure resolutions, the value of implicit bank debt guarantees has declined especially for small but also larger banks. More recent evidence is consistent with that interpretation. Practices do matter.

The 2014 OECD/CMF Survey on implicit bank debt guarantees highlights that most policy-makers do not regularly monitor estimates of implicit bank debt guarantees. Looking ahead, such estimates could help policy-makers to assess the effectiveness of bank reform. Falling values of estimates would indicate success in reducing government support for hitherto too-big-to-fail banks. If there was no empirical evidence of a significant value of implicit bank debt guarantees for “too-big-to-fail” banks compared with other banks, then the bank failure resolution framework would have ensured the perception that any bank, regardless of its size, complexity or interconnectedness would be expected to be allowed to fail.

New bank failure recovery and resolution options are available in many jurisdictions, but to make these options credible, governments need to be prepared to use them and plan their use. Such planning not only makes the resolution options more credible but, if properly communicated, also increases the transparency and predictability of the response by public authorities to bank failures, thus helping dispel the belief that bank debt continues to be “special”. That said, while members of the CMF saw this argument as having merits, several of them also highlighted that public authorities may face challenges in communication which they need to conduct carefully given the potentially contentious nature of the issue.

Notes

1. For some time now, the OECD Committee on Financial Markets has placed a sharp focus on the use of guarantees to achieve public policy objectives and the benefits and costs of under-priced guarantees, and it has decided to continue its work on the issue as part of its programme of work for 2015-16. Such explicit or implicit guarantees influence economic incentives, risk-taking and the income distribution, in some cases in undesirable ways.

2. Implicit guarantees also exist for the debt of other financial intermediaries. Financing is traditionally more bank-intermediated and securitisation less developed in Europe than in the United States. Thus, bank assets have a much greater weight in Europe relative to the size of the economy than in the United States.
3. The OECD Committee on Financial Markets has developed a methodology to estimate the value of implicit guarantees for the debt of banks (see e.g. Schich and Lindh, 2012, and Schich et al., 2014).
4. The assessment that “too much” lending has occurred is based on an application of the econometric approach developed by Cournède and Denk (2015) who investigate the relationship with economic growth of credit held by all financial institutions, not only banks. They present a wider range of panel data results, including evidence not only of correlation but also of causality running from excess finance to lower growth.
5. The specification includes more than 12 control variables.
6. A caveat is that the wage premium in Denk et al. (2015) relates to all employees in the financial sector rather than only those who work for banks. The database underpinning the estimation does not allow to draw such a distinction.
7. See Bennett et al. (2014) for a recent overview of empirical studies of evidence of market discipline.
8. Footnote by Turkey: “The information in this document with reference to ‘Cyprus’ relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the ‘Cyprus’ issue.” Footnote by all European Union member States of the OECD and the European Commission: “The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.”
9. In estimating the value of implicit bank debt guarantees, many empirical studies focus on debt securities rather than deposits. For example, most respondents to the OECD/CMF Survey on implicit bank debt guarantees reported that the empirical studies of implicit bank debt guarantees they were aware of focus on “all ratings-sensitive debt”, while only few respondents mentioned deposits (Schich and Aydin, 2014a). A recent study by Jacewitz and Pogach (2014) focuses on deposits (the largest source of funds for banks) and finds evidence that larger banks pay significantly lower risk premiums on deposits than smaller banks and that these differences cannot be attributed to standard balance-sheet measures of risk.
10. Other factors tend to favour debt over equity funding of firms generally. For example, effective average tax rates on equity finance typically exceed those of debt finance, mostly because interest payments but not dividends are recognised as deductible costs in corporate taxation.
11. The sample covers 12 OECD countries which belong to the euro area: Austria, Belgium, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, the Slovak Republic and Spain. The income concept is annual household gross income. The data source for the calculations is the Eurosystem Household Finance and Consumption Survey from 2010.
12. The specification regresses real GDP growth per capita on bank credit, gross fixed capital formation divided by GDP, average years of schooling in the adult population, the growth rate of the working age population, country fixed effects, year fixed effects and country-specific linear time trends.
13. Cournède and Denk (2015) show that the results are insensitive to a wide range of robustness checks. The primary focus of their analysis, in contrast to the present paper, is credit held by all financial institutions, not only banks.
14. The sample covers 12 OECD countries which belong to the euro area: Austria, Belgium, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, the Slovak Republic and Spain. The income concept is annual household gross income. The data source for the calculations is the Eurosystem Household Finance and Consumption Survey from 2010.
15. The sample covers 18 OECD countries which belong to the European Economic Area: Belgium, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden and the United Kingdom. The income concept is gross annual earnings of full-time full-year equivalent employees. The calculations use as data source the Eurostat Structure of Earnings Survey from 2010. The definition of finance in this dataset is broader than in the other empirical exercises in the present paper, as it includes jobs in banking, insurance, pension funding and auxiliary financial activities.

16. The financial sector wage premium relates to employees in finance compared with employees in other sectors and is obtained from regressions of log wage on age, gender, highest level of education, years of experience in the firm and their square, employees in the firm, geographical location of the firm, type of financial control, level of wage bargaining, type of employment contract, number of overtime hours paid, occupation and their interactions with a financial sector dummy.
17. The final report of the enquiry (Australian Treasury, 2014b) explains that the resilience of the Australian banking sector should be improved by strengthening policies that lower the probability of failure, including by setting ambitious bank capital ratios, and by reducing the costs of failure, should it occur. The report expects that its recommendations also produce efficiency benefits, including through reducing implicit guarantees and volatility in the economy and promoting confidence and trust.
18. A host of other measures are aimed at supporting the orderly resolution, including those aimed at strengthening depositor protection. For example, a recent consultation paper sets out proposed changes to the United Kingdom's Prudential Regulation Authority's rules in order to implement the recast Deposit Guarantee Schemes Directive (Bank of England Prudential Regulation Authority, 2014).
19. A country is classified as having high implicit bank debt guarantees when the average credit rating uplift for bank debt across its banks between 2007 and 2013 exceeded 3 credit rating "notches" (with one "notch" being the distance between two adjacent rating categories, e.g. between AAA and AA). The data are an OECD Secretariat update from Schich and Lindh (2012) using Bloomberg and SNL. Seven of the 24 OECD countries for which data are available meet this criterion: Austria, Belgium, Finland, Germany, Japan, Luxembourg and South Korea.
20. A careful assessment of resolution practices using case studies from different countries is available in Dübel (2013).
21. Further to resolution practices, credit rating agencies also closely monitor the discussion on bank structural reform in Europe, not least as the outcome of such discussions is expected to have implications for the resolvability as well as risk-taking of large European banks. Several European countries are considering or have already implemented legislation that attempts to separate certain risky activities from those considered as protection-worthy, hence facilitating resolution as well as limiting undesirable cross-subsidisation between the different parts. Many of these approaches are inspired by the so-called Volcker, Vickers, or Liikanen proposals and are reviewed, and compared to the proposal supported by the OECD Secretariat, in Blundell-Wignall and Atkinson (2012).

APPENDIX

*Detailed regression results*Table 1. **Implicit bank debt guarantees and the bank credit and GDP growth relationship**

Dependent variable:	GDP growth per capita			
	(1)	(2)	(3)	(4)
Bank credit:				
All countries	-0.024*** (0.005)	-	-	-
No creditor participation (2008-12)	-	-0.023*** (0.007)	-	-
Creditor participation (2008-12)	-	-0.012 (0.009)	-	-
No creditor participation (2008-14)	-	-	-0.024*** (0.008)	-
Creditor participation (2008-14)	-	-	-0.014* (0.008)	-
High credit rating uplift (2007-13)	-	-	-	-0.031*** (0.008)
Low credit rating uplift (2007-13)	-	-	-	-0.024*** (0.006)
Investment rate	0.249*** (0.041)	0.192*** (0.050)	0.199*** (0.050)	0.200*** (0.051)
School years	0.112 (0.293)	-0.222 (0.274)	-0.153 (0.272)	-0.089 (0.304)
Population growth	-0.678** (0.310)	-1.080*** (0.292)	-1.066*** (0.283)	-0.917** (0.378)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Linear country trends	Yes	Yes	Yes	Yes
R-squared	0.501	0.541	0.541	0.523
Sample period	1961-2011	1961-2011	1961-2011	1961-2011
Observations	1254	872	872	1021

Note: All regressions are OLS. Standard errors, which are shown in brackets, are clustered at the country level. *** indicates significance at the 1% level, ** at the 5% level and * at the 10% level. Bank credit is credit to the non-financial private sector by deposit money banks divided by GDP, investment rate is gross fixed capital formation divided by GDP, school years is average years of schooling in the population aged 25 and over, and population growth is the growth rate of the population aged 15-64. In countries with “No creditor participation”, unsecured creditors have not incurred any losses in the reference period. In countries with “Creditor participation”, bank failures have occurred and unsecured creditors have incurred losses as part of failure resolution in the reference period. In countries with a “High credit rating uplift”, the average credit rating uplift over the reference period exceeded 3 percentage points, while in those with a “Low credit rating uplift” it was less than 3. The sample covers 21-34 OECD countries.

Source: OECD Secretariat calculations using World Bank Global Financial Development database; Bank for International Settlements credit series; Schich and Kim (2012); OECD Secretariat update from Schich and Kim (2012) using data publicly available from Moody's website; OECD Secretariat update from Schich and Lindh (2012) using Bloomberg and SNL; World Bank World Development Indicators database; OECD Economic Outlook database; Barro and Lee (2013).

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