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Systemic Financial Crises: How to Fund Resolution

by

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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. To fill that gap, different approaches have been adopted across countries in the recent crisis. Where support for the financial sector was provided as part of policy response to the crisis, new taxes have been adopted to generate revenues* ex post, *although the specific approaches have differed. While there is no single solution in this regard, this report finds that* ex ante *funded systemic crisis resolution funds, together with strengthened failure resolution powers, are in principle adequate to help fill the gap.*

JEL Classification: E44, G01, G21, G28, E61, H21.

Keywords: systemic financial crisis, systemic crisis resolution fund, deposit insurance, financial activities taxes, ex ante *versus* ex post *funding.*

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EXECUTIVE SUMMARY

"The financial sector needs to provide a fair contribution to the resolution of the recent systemic crisis, especially where financial institutions have benefitted from government support during the financial crisis". This basic principle was broadly supported by delegates at the CMF discussion on how to raise revenues in order to fund systemic crisis resolution. Views on how to achieve that goal differed, however. Thus, the CMF discussion was illustrative of the broader ongoing debate regarding mechanisms for enhancing financial stability, which has been taking place in international forums, including in particular the FSB and the G20. Several different types of financial-sector taxes or levies have been proposed or implemented, many of which could be interpreted as measures to fund systemic crisis resolution *ex post* (*i.e.* after the crisis occurs). The observation that the different measures adopted have been little coordinated across borders is likely to have resulted in additional costs in terms of potential distortions to competition and incentives.

There is broad agreement that the financial crisis has highlighted the need for effective failure resolution arrangements, especially -- but not necessarily -- exclusively for institutions considered to be systemically relevant. A common component of failure resolution arrangements around the world is deposit insurance, but existing arrangements are not designed to deal with systemic crises of the extent recently witnessed. Even where deposit insurance funding is currently characterised by a significant *ex ante* funding element, a "funding gap" for systemic crisis resolution seems to exist. Deposit insurance schemes are not meant to deal by themselves with systemically significant bank failures or a systemic crisis. Rather, the existence of deposit insurance is meant to limit the spread of problems from troubled institutions to otherwise healthy institutions. Reflecting this principle, actual funding levels of many deposit insurance schemes do not seem to be large enough to easily absorb the effects of widespread bank failures or even the failure of one or more of the largest, and perhaps systemically important, banks. An additional finding of this report is that deposit insurance fund balances have not decreased in many jurisdictions throughout the crisis, even in some countries where banking sectors have experienced significant stress. This observation suggests that deposit insurance arrangements did not bear the brunt of the shock absorption that occurred in these countries. All told, some other mechanism is needed to fill the gap. *Ex ante* funded systemic crisis resolution arrangements are suited in principle to such a task, at least partly.

Consistent with this observation, some countries are undertaking efforts to fill the gap by strengthening existing deposit insurance mechanisms and/or complementing them with other measures to fund systemic crisis resolution (*e.g.* Sweden and Germany). One central critique of *ex ante* resolution funds, however, is that these arrangements could transform what was an exceptional policy response in this particular crisis into an entitlement. There are merits to this line of reasoning, but the mechanisms that have been adopted or proposed for forward-looking financial sector contributions to systemic crisis resolution recognise this issue, and they foresee a new or improved resolution regime with additional tools intended *precisely* to avoid the need to resort to bail-outs.

In the absence of such additional tools, there is a tendency on the part of governments to provide financial institutions with extensive guarantees for their liabilities and sometimes assets. While such measures can be helpful, they are not costless, even when they do not involve significant upfront fiscal costs. Further to potential distortions to competition and incentives arising from such measures, earlier CMF work already concluded, the capacity of some governments to provide for the government-supported guarantees for financial institutions could be questioned.

I. Motivation and background

The recent financial crisis has revealed shortcomings in some financial safety net arrangements, while highlighting the need for fiscal consolidation

In response to the recent financial crisis, several countries have either introduced or considered the introduction of systemic risk levies or special taxes on financial institutions and activities. These actions and deliberations have to be seen against the backdrop of these two observations:

- First, the recent financial crisis has revealed shortcomings in some financial safety-net arrangements and has highlighted that existing tools in many jurisdictions were inadequate to finance the resolution of a severe systemic crisis.
- Second, at the same time, in part reflecting the expansion of government-provided safety nets and the associated increase in actual fiscal outlays and contingent fiscal liabilities, the financial (and economic) crisis has also highlighted the need for fiscal consolidation in many countries.

To fill the funding gap, countries have resorted to different approaches

To fill the funding gap with regard to systemic crisis resolution, CMF participating jurisdictions (e.g. Germany, Hungary, Sweden, United Kingdom, and the United States) have taken a number of different policy approaches. They include both i) *ex post levies* charged to make financial sectors contribute more fully than they did up to now to the costs of the financial crisis resolution and ii) *ex ante premiums* to finance systemic crisis resolution in the future.

The present article is based on a report prepared for discussion of that topic by the OECD's Committee on Financial Markets, and it takes into account the results of that discussion.[1] It focuses on aspects of the funding of systemic crises resolution, taking into consideration current efforts to strengthen resolution regimes. In fact, while the stated aim of current efforts to reform financial regulation is to avoid exposing taxpayers to losses, it is recognised that failure resolution involves measures that typically require funding, which could occur either ex ante or ex post. The present article compares the funding of deposit insurance schemes in a selection of countries, highlighting the "funding gap" left by these arrangements in the recent financial crisis. It then attempts to provide an overview of some of the key features of different approaches for filling that gap, which have recently been proposed or adopted. In discussing these approaches, the article raises and addresses the following questions:

- What is the evidence for gaps in *ex ante* funding of systemic crisis resolution under existing deposit insurance arrangements?
- How should revenues be raised for funding systemic crisis resolution (*ex ante*, *ex post*, or a combination of these two approaches)?
- If taxes are used, should the funds be collected from general taxation or through specific corrective taxes, including taxes aimed at reducing systemic risk?

II. Fiscal and Other Costs of Systemic Crises (Resolution)

The incidence and costs of systemic crises

A systemic crisis is associated with breakdowns of significant parts of the financial system, as well as impaired operation of the real economy

A ***systemic crisis*** is *a* materialisation of ***systemic risk***. Thus, a systemic crisis could be defined with reference to systemic risk for which the FSB, IMF, and BIS have developed a working definition, namely *the risk of a disruption to financial services that is (i) caused by an impairment of all or parts of the financial system; and (ii) has the potential to have serious negative consequences for the real economy* (FSB/IMF/BIS, 2009). Fundamental to this definition is the notion that systemic risk is associated not just with breakdowns of significant parts of the financial system but also with negative externalities, and in particular the impaired operation of the real economy.

Not every materialisation of systemic risk results in a systemic crisis, however. The policy response, as well as other developments, may prevent the materialisation of such risk to develop into a full-fledged systemic crisis. Historical experience shows that situations in which financial crises do reach exceptional proportions prompt governments to intervene to help restore financial stability.

Consistent with that observation, Laeven and Valencia (2010) recently proposed a definition for (dating) systemic crises, based on a mix of quantitative and qualitative criteria to determine whether two conditions are met: First, *significant signs of financial distress in the banking sector*, as indicated by significant bank runs, losses in the banking system, and bank liquidations. Second, *significant policy intervention measures in response to significant losses in the banking system*, as measured by the extent of the policy response.[2] When these conditions are met, a financial crisis is considered to be systemic. According to that measure, over the period 1970 to 2009, many CMF member participating jurisdictions and accession countries experienced systemic banking crises (Figure 1).

Real output costs can be very significant

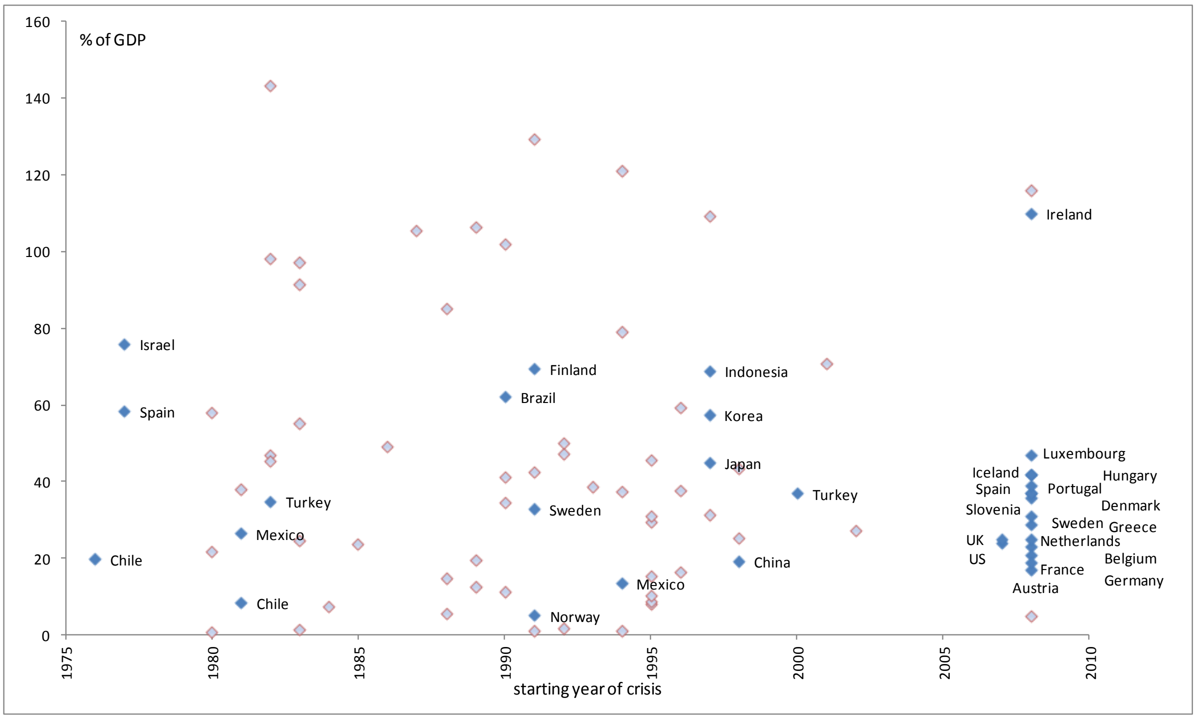
Three observations are singled out here for special attention regarding the total economic costs of systemic financial crises, based on the estimates by Laeven and Valencia (2010).[3]

- First, there is wide variation in the (estimated) real output costs, measured as the cumulative difference between actual and trend real GDP (expressed as a percentage of trend real GDP, which is extrapolated from the pre-crisis period). This observation reflects a variety of factors, including the relative size of the banking sector compared to the total economy, the extent of the initial shock, the range of policy instruments available (including resolution powers), and the policy response.

- Second, output losses can be very substantial. As shown in Figure 1, estimated real output losses measured as the cumulative difference between actual and trend real GDP often amounted to 20% to 40% of a country's annual GDP.

- Third, there were numerous systemic crises in CMF-participating jurisdictions during the last three and a half decades, but they tended to be isolated events. In the most recent crisis, there has been a bunching of systemic crisis instances. Focusing on the CMF participating countries that experienced positive real output losses as a result of systemic crises (identified in Figure 1 by dark diamonds), almost half the cases occurred quite recently, starting either in 2007 or 2008.

Figure 1. Systemic crises and estimated losses in real output



Notes: Systemic banking crises as identified by Laeven and Valencia (2010), including cases "that almost met the definition of a systemic crisis" (i.e. France, Greece, Hungary, Portugal, Slovenia, Spain, and Sweden in 2008; and Brazil in 1990), where estimated output losses are greater than zero. For expositional purposes, the figure does not show instances in which data on output losses are either zero or not available. Dark diamonds indicate CMF member participating jurisdictions (including accession and enhanced engagement) countries, and light-grey diamonds indicate other countries.

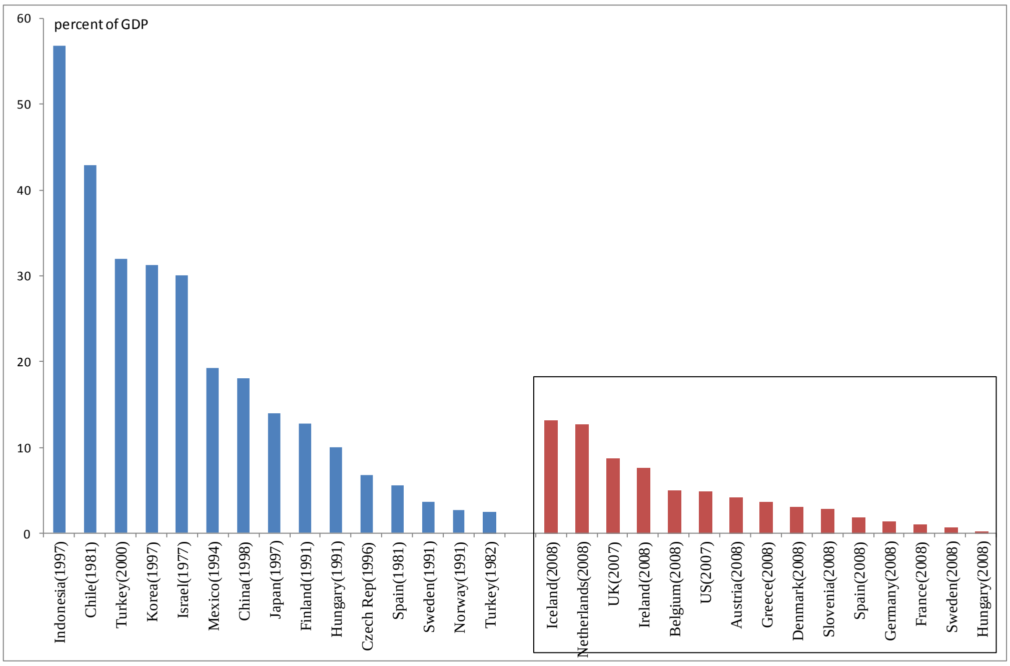
Source: Laeven and Valencia (2010).

The policy responses to the materialisation of systemic risks have some common elements. In the initial containment phase, liquidity pressures are addressed through liquidity support and expanded guarantees on bank liabilities. Subsequently, during a resolution phase, a wide array of measures is being used, including guarantees, capital injections, and asset purchases or excess-loss arrangements. While policy responses have in these respects been broadly similar across different systemic crises over the last few decades, some nuances do exist, however.

The fiscal costs of systemic crisis resolution also tend to be relatively high

The estimated gross fiscal costs associated with systemic crisis resolution can vary significantly from one episode to another, as illustrated in Figure 2 using the example of CMF participating jurisdictions. On average, during systemic crises occurring from 1970 to 2007, as shown in the figure, gross fiscal costs amounted to more than a sixth of a country's annual GDP, on average. In the case of the systemic crises during 2008 and 2009, that average is much lower, however, at close to 5%.

Figure 2. Systemic crises and estimated gross fiscal costs during the crisis



Notes: Estimated gross fiscal costs incurred throughout the five years since the beginning of the crisis in the case of previous systemic crises up to and including 2007 (Laeven and Valencia, 2008). Estimated gross fiscal costs from either 2007 to 2009 in the case of the United Kingdom and the United States, and from 2008 to 2009 in the case of the other countries shown in the context of the recent financial crisis (based on Laeven and Valencia, 2010). Date in parenthesis denote the starting year of the crisis. Gross fiscal costs include recapitalisation outlays and do not include any recoveries; hence, they are different from net fiscal costs. Deposit insurance payouts are not included in the estimates of fiscal costs associated with the crises in 2007 and 2008. In the case of Iceland, obligations to foreign depositors arising from the Icesave crisis are not included.

Source: OECD Secretariat calculations based on Laeven and Valencia (2008, 2010).

Rapid and extensive monetary expansion and the extensive use of government-provided guarantees were particularly prominent in the policy responses to the recent crisis; this aspect explains in part why the estimated *gross fiscal costs* associated with the direct support of banks during the recent financial crisis have so far been more limited when compared to earlier crises. That said, these interventions have nonetheless given rise to other costs resulting from potential distortions to competition and incentives, which tend to be excluded from the type of cost estimates used to produce Figure 2,[4] and it is uncertain what the *net fiscal costs* of the recent crisis will turn out to be.

The direct fiscal costs of the recent crisis do not fully reflect its total fiscal impact

As regards fiscal costs, Laeven and Valencia (2008) estimate that the net fiscal costs of systemic crisis resolution amount to about 13.3% of GDP on average, based on a larger sample than shown in Figure 2, and including 42 banking crises during the period 1970 to 2007. Comparable estimates are not yet available for the 2008-2009 systemic crisis episodes, but the fiscal costs of direct support, net of amounts recovered so far, have been estimated by the IMF to average 2.8% of GDP for advanced G-20 countries (IMF, 2010a).

Be that as it may, the direct fiscal costs of the recent crisis underestimate the total fiscal impact of the crisis, and this situation is being reflected in the total expected increase in public debt. Many types of support measures for financial sectors lead to increases in actual fiscal liabilities, as well as to contingent liabilities (as is the case for government-supported guarantees), and these liabilities in turn influence perceptions of sovereign default risks and risk premiums.

Just as in previous episodes, the most recent crisis has been followed by a rise in public debt

A rise in public debt is indeed a common phenomenon subsequent to many systemic financial crises. The recent episode is no exception in that regard: Government debt of the G20 countries is projected to exceed pre-crisis levels by about 40%, although most of that increase appears to reflect revenue losses associated with the deceleration of real economic activity, rather than the cost of fiscal stimulus measures. Financial market participants have paid considerable attention to these types of costs, as indicated by the recent and ongoing episodes of sovereign debt funding pressures, especially for small economies with large financial sectors.

Avoiding the occurrence of systemic crises

Avoiding the occurrence of a systemic crisis is the first-best solution to limiting the costs of crises

Avoiding the occurrence of a systemic crisis is the first-best solution to limiting the costs of crises, and hence to reducing any need for funding resolution. Guided by this principle, a number of collaborative efforts are currently being undertaken involving national authorities and international supervisory and regulatory bodies. High-level priorities in this regard are: to enhance buffers and limit risk-taking at the level of individual institutions; improve incentives and market functioning; and eliminate moral hazard from systemically important institutions, and to develop a framework for effective macro-prudential supervision. Indeed, one of the key insights provided by this crisis has been that a system is not necessarily stable even when all its parts, when viewed individually and separately, appear stable by some measure. As a result, enhanced efforts are currently being made to identify the implications for risk to the system created by the interaction of the many individual choices being made.

However, residual risk of a systemic crisis will remain despite all regulatory effort

But regulatory measures will never eliminate all risk of systemic financial instability. Early intervention powers on the part of relevant authorities are helpful in further reducing that risk, in particular since such powers (as already available, *e.g.* in the case of some deposit insurance agencies) enable authorities to address situations of distress before these spread to the wider financial system. But there will always be a *residual* risk that the government will need to intervene beyond the normal operation of the safety net in order to stabilise the financial system, and that inevitably comes at a cost which has to be met by revenue raising measures. Thus, the effective funding of systemic crisis resolution will remain an issue, even if considerable progress is achieved in reducing systemic risks.

III. An assessment of funding "gaps"

Self-insurance

The focus of current regulatory efforts is on strengthening self-insurance

One straightforward means for funding systemic crisis resolution is strengthening self-insurance. Indeed, much of the current regulatory effort focuses on specifying higher capital and liquidity buffers and improving the quality of those buffers at the level of individual institutions, especially those considered to be systemically important. These measures, and the specific efforts to fund systemic crisis resolution discussed here, can complement each other, although the joint impact needs to be carefully assessed.

There are different potential means of financing the resolution of systemic crises

Self-insurance will not be sufficient under all circumstances, thus additional measures to fund systemic crisis resolution can either be integral to general revenue raising or dedicated to a separate systemic risk resolution fund. They can be applied either before a crisis (*ex ante*) or after (*ex post*). And they can be designed either to share the burden widely among taxpayers or to place greater weight on the financial sector itself. Actually, specific arrangements already exist to achieve effective failure resolution, although the scope of these arrangements typically does not include the resolution of systemic crises, thus opening up a funding and/or resolution gap.

The role of deposit insurance arrangements

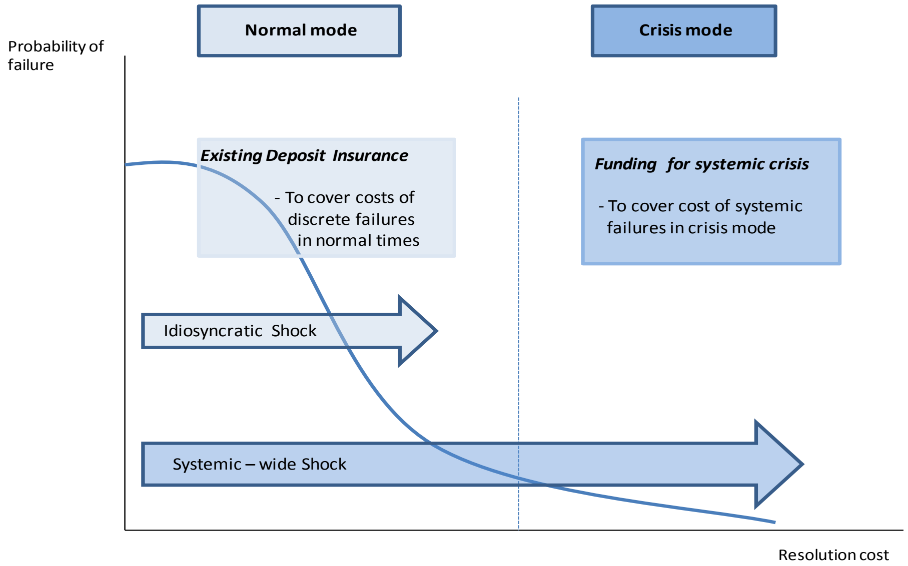
Deposit insurance schemes are arrangements for burden-sharing in case of failure by individual deposit-taking institutions. A key purpose of such arrangements is to limit the potential of problems at one bank to spill over to other healthier banks, thereby reducing the possibility of a chain reaction within the banking system as a whole. Another benefit is that, especially where consistent exit procedures exist, deposit insurance gives policy authorities greater freedom to let troubled banks fail. To facilitate the orderly failure of banks, several deposit insurance schemes possess additional specific failure resolution powers, thereby limiting the potential costs to taxpayers of the failures.

Deposit insurance schemes are not designed to absorb shocks of the magnitude experienced recently

Systemic crises are, however, not meant to be exclusively dealt with by deposit insurance schemes. The core principles for effective deposit insurance systems developed jointly by the BCBS and IADI (2009) suggest the following: "*A deposit insurance system is not intended to deal, by itself, with systemically significant bank failures or a "systemic crisis". In such cases all financial system safety-net participants must work together effectively. In addition, the costs of dealing with systemic failures should not be borne solely by the deposit insurance system but dealt with through other means such as by the state*" (a stylised description is provided in Figure 3).

The observation that the parameters of many deposit insurance arrangements were changed on an ad hoc basis by governments in response to the financial crisis, often on a temporary basis, is clear evidence that these schemes were indeed insufficiently equipped to absorb shocks of the magnitude experienced recently (Thorat, 2010).

Figure 3. Scope of arrangements for financial shock absorption



Source: OECD Secretariat estimate based on Yosuke (2010).

Deposit insurance arrangements were not the main component of the shock absorption in many countries

Also, deposit insurance fund balances have not decreased in many jurisdictions throughout the crisis (Figure 4), even in some countries where banking sectors have experienced significant stress. One might infer from this observation that deposit insurance arrangements were not the main component of the shock absorption in these countries. Thus, one question is how existing deposit insurance arrangements could be strengthened by enhancing funding arrangements and by also expanding the resolution powers of the deposit insurance agency where such powers do already exist, and introducing them where they do not exist.

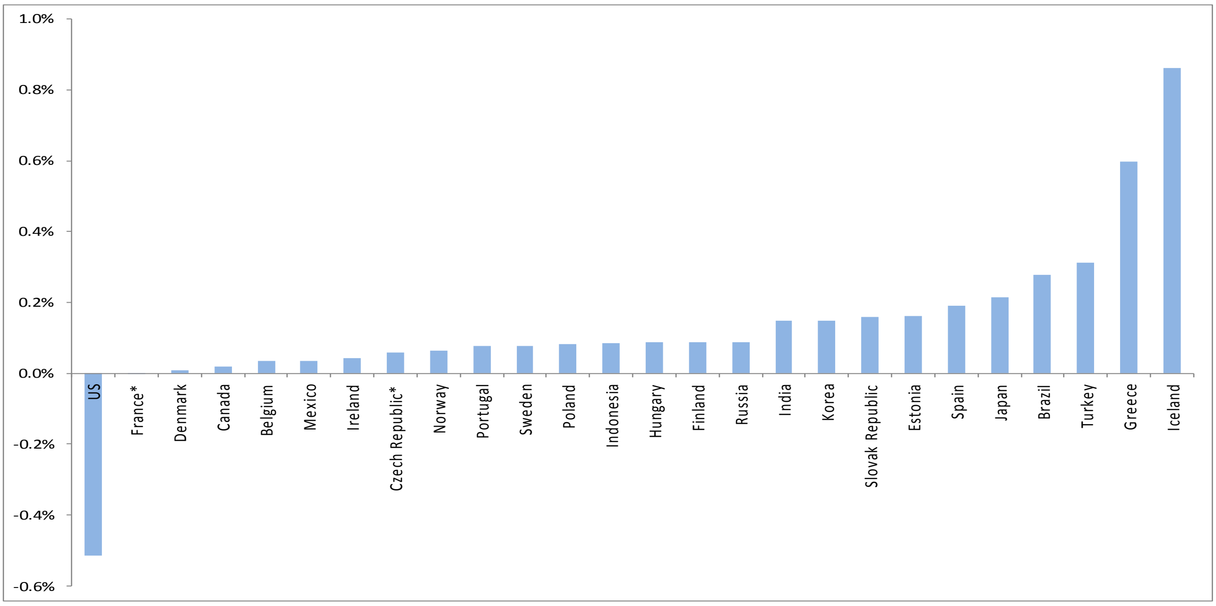
In addition to funding, resolution powers need to be strengthened

Indeed, some deposit insurance arrangements already have specific failure resolution powers, and where they exist, they have been strengthened in response to the recent financial crisis. Where they do not exist, the question whether to introduce such powers has become even more relevant than before the financial crisis (Box 1).

As regards efforts to strengthen deposit insurance funding arrangements, one specific question is to what extent (efficient) deposit insurance may need to involve premiums actually levied on individual banks, which factor in the contribution of these banks' activities to overall systemic risk (Acharya *et al.*, 2009). Measuring marginal risk contributions is difficult, though, and perhaps may prove too complex in practice, for some cases at least. In the United States, however, the FDIC has adjusted its premium assessment so as to charge large, international financial institutions relatively higher fees as compared to smaller and less-complex institutions. This approach attempts to capture elements of "systemicness" of an institution, and it is similar in this sense to some of the proposals for new taxes or levies discussed further below. As a result, more of the funding burden would shift to the bigger, and perhaps more complex, banks and away from the smaller ones.

Figure 4. Change in deposit insurance fund balances during the recent crisis

Selected schemes; change in fund balances between 2007 and 2009; as of 2007 GDP



Notes: Change in deposit insurance fund balance (asset minus liabilities or total equity) between 2007 and 2009 (or between 2007 and 2008 in the countries indicated by *), as 2007 GDP of respective country.

Source: OECD Secretariat estimates based on annual reports of deposit insurers.

Box 1. Strengthening resolution powers

Empirical evidence suggests that the choice of resolution policies affects the fiscal cost of resolving banking crises. In particular, early intervention in undercapitalized banks tends to reduce the fiscal costs of banking crises. By contrast, significant and long-lasting liquidity support, regulatory forbearance and blanket guarantees for depositors and other creditors all tend to increase the fiscal costs. Often, the latter course of action reflects a lack of viable policy instruments for managing the resolution or even for conducting the orderly bankruptcy of financial institutions. As pointed out in earlier CMF-related work, having a wide range of resolution powers available tends to reduce the cost of dealing with the failure of financial institutions (Lumpkin, 2008).

Deposit insurance systems in some jurisdictions have significant bank resolution powers, enabling them to intervene before asset values are fully depleted and to achieve less costly resolution. In some cases, intervention on the part of public authorities is triggered when specific pre-defined specific thresholds are reached, and such mechanisms limit the extent to which regulators can choose forbearance. There is growing recognition that resolution powers need to be introduced and/or strengthened where feasible. Specific challenges arise, however, in the case of large and complex financial institutions, especially to the extent that they conduct activities across different financial sectors and across borders. The crisis has also highlighted the fact that existing deposit insurance systems are primarily nationally focused and that existing domestic-based arrangements do not adequately incorporate the cross-border externalities that may be generated by the failure of internationally operating banks. One proposal to deal with this issue is to set up new regional or international deposit guarantee systems funded *ex ante* by the levying of risk-based fees, and given effective resolution powers for dealing with cross-border entities.

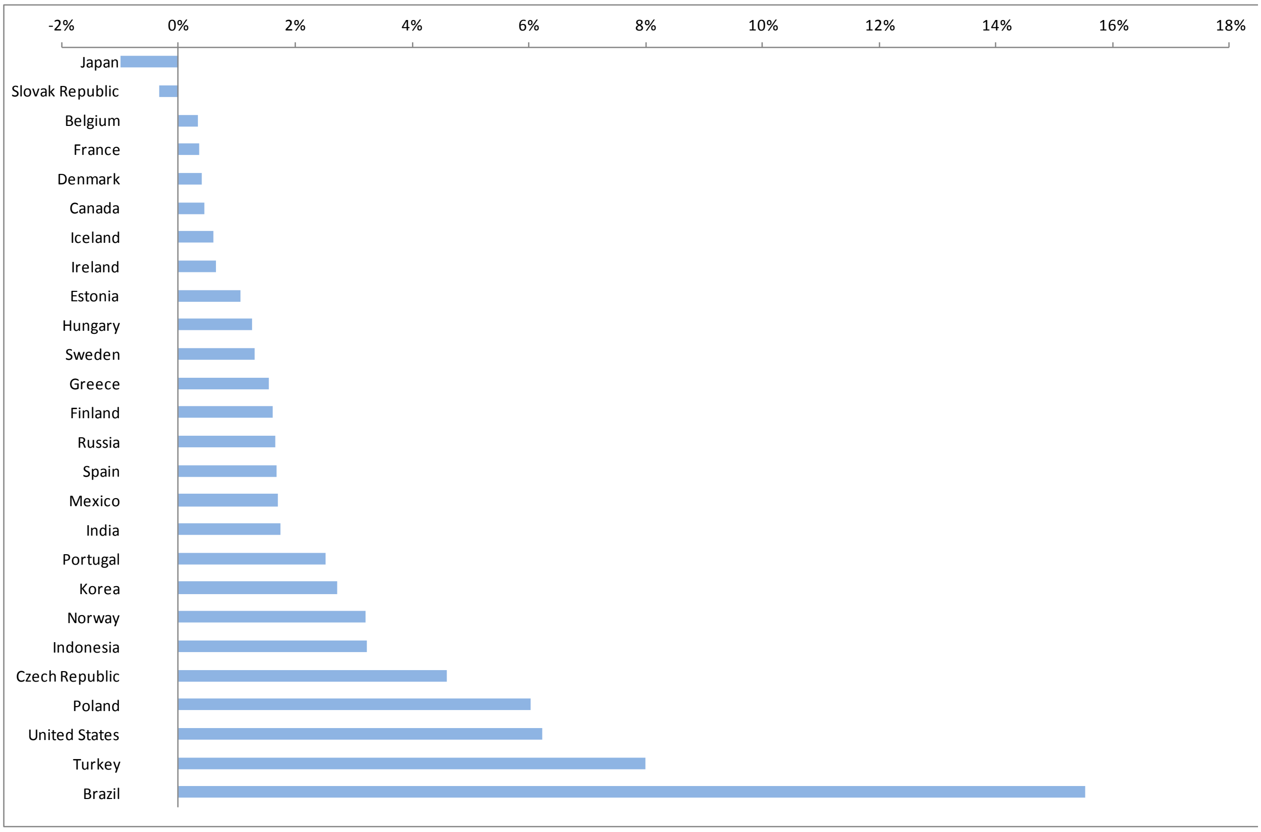
In response to the financial crisis, special bank failure regimes have been refined and/or new resolution tools have been added in a number of countries, including Denmark, France, Germany, the United States, the United Kingdom, and Spain. Also, the perimeter of some of these regimes has now been widened to include financial institutions other than deposit-taking banks, especially those that are considered to be systemically important. For example, in the United States, new regulatory tools strengthen the FDIC's supervisory and potential resolution powers in the case of systemically important financial institutions.

Even where* ex ante *funding exists, funding levels seem small compared to the deposits at large banks

Even where deposit insurance funding is currently characterised by a significant *ex ante* funding element, a "funding gap" for systemic crisis resolution seems to exist. Actual funding levels for many deposit insurance schemes do not seem to be large enough to easily absorb the effect of widespread bank failures or even the failure of one or more of the largest (and perhaps systemically important) banks, given the size of such entities (Figure 5). For example, *ex ante* funding levels at the end of 2007 -- that is before the financial crisis attained its peak -- vary between a few basis points and close to 4% of all insured deposits, depending on the scheme. In more than half of the schemes considered here, the deposit insurance fund reserve ratio does not exceed 1% (Figure 6).[5] The funding levels of deposit insurance schemes are also not very large compared to the size of total customer deposits at some large individual banks, with deposit insurance fund balances not attaining 10% of customer deposits (used here for convenience instead of insured deposits) at the largest bank for most of the constituencies under consideration here.

Figure 5. Deposit insurance fund balances as % of customer deposits at country's largest bank

Selected schemes, end of fiscal year 2007

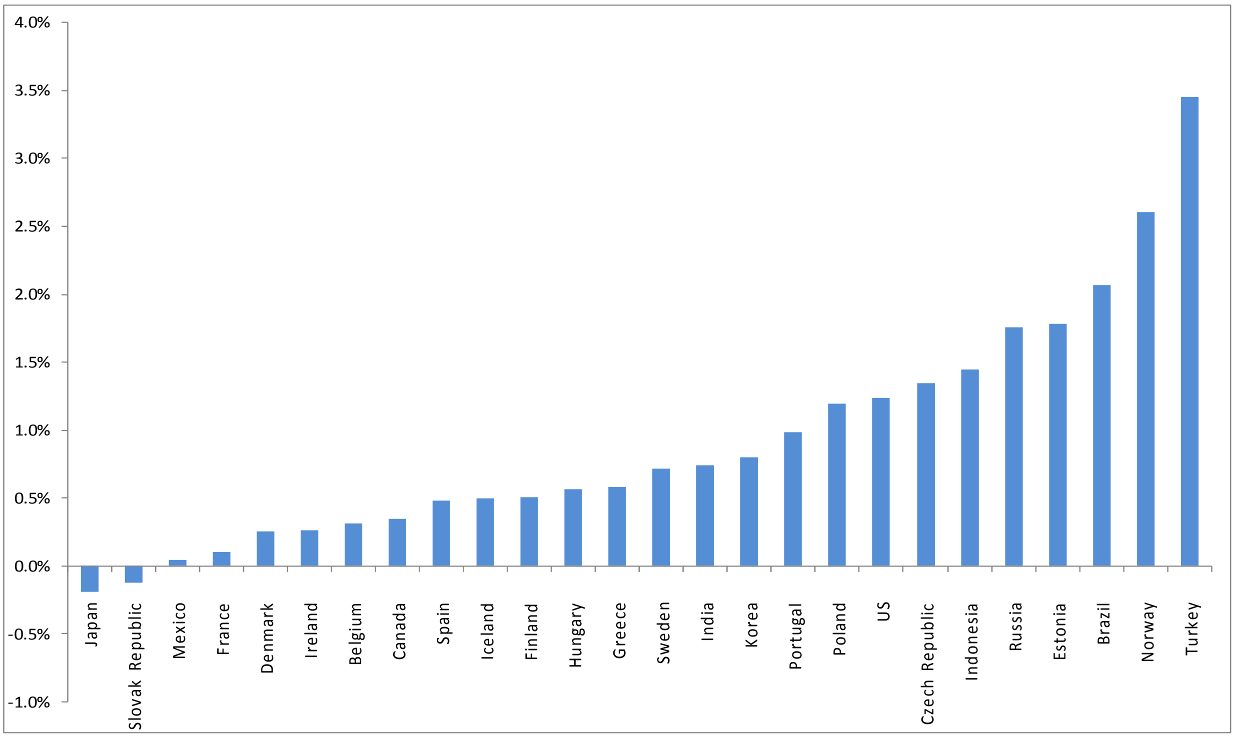


Notes: Deposit insurance fund balances divided by total customer deposits at the largest bank according to *The Banker* ranking. This measure is a simple measure of the relative size of the largest bank in each economy. Note, however, that customer deposits are not identical to insured deposits.

Source: Secretariat estimates based on annual reports of deposit insurers; *The Banker* database.

Figure 6. Deposit insurance fund reserve ratios

Selected schemes, end of fiscal year 2007



Notes: Deposit insurance fund ratios are defined as the deposit insurance fund balance divided by total insured deposits. Total insured deposits are deposits repayable by the guarantee scheme before the level of coverage is applied. Schemes shown are those that have some element of *ex ante* funding and for which data are available from public sources. Accounts for servicing debt accumulated in previous crises are not included. Some schemes are compensation schemes for depositors and investors.

Source: OECD Secretariat estimates based on annual reports of deposit insurers and European Commission (2010a).

Obviously, these ratios do not measure the actual resolution capacity of deposit insurance schemes, since such capacity consists of both *ex ante* and *ex post* funding facilities, including contingent credit lines and the capacity to impose special assessments, etc. The ratios shown here nonetheless provide an empirical reference for assessing the possible "*ex ante* funding gaps" that recent proposals for the *ex ante* funding of systemic crisis resolution may be intended to fill. A different question, beyond the scope of this report, is whether, and how, higher *ex ante* funding levels for deposit insurance schemes should be encouraged.

IV. How to raise revenues?

The funding gap for financing systemic crisis resolution could be filled through taxes or levies in different forms, and two broad types of approaches are distinguished in this section:

i) revenue-raising (from various taxes or levies) with the purpose of financing systemic risk resolution;

ii) revenue-raising through levies designed specifically to reduce systemic risk, as well as to finance systemic risk resolution.

A stylised overview of selected policy measures, based in part on this distinction, is provided in Figure 7. The assessment made is somewhat subjective and intended to facilitate understanding of the discussion in the remainder of this chapter.

Figure 7. Tentative categorization of selected policy measures for funding systemic crisis resolution

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Main thrust of policy measure?</td></tr>
<tr><td>Revenue raising</td><td>Corrective</td></tr>
<tr><td rowspan="3">Funding systemic crisis resolution</td><td>Ex-ante funding for future crisis</td><td colspan="2">Sweden : Stability Fund
Germany : Restructuring Fund
EC : Bank Resolution Fund
IMF : Financial Stability Contribution</td></tr>
<tr><td rowspan="2">Ex-post revenue generation for general budget</td><td colspan="2">United States : Financial Crisis Responsibility Fee
Hungary: Bank levy
United Kingdom : Bank levy
Austria: Bank levy
France : Bank levy</td></tr>
<tr><td></td><td>United Kingdom : Bank Payroll Tax
France : Temporary Bonus Tax
Italy : Permanent Bonus Tax
IMF : Financial Activities Tax</td></tr>
</table>

Notes: A clear-cut distinction between "revenue-raising" and "corrective" motivations does not exist. One might argue that, on a conceptual level, any corrective effect must by definition be attempted through an "*ex ante*" measure. The distinction made between "*ex ante*" and "*ex post*" in the categorisation made above refers primarily to the revenue raising objective, though that is either to fund resolution of the recent crisis ("ex post") or a potential future crisis ("ex ante").

Source: OECD Secretariat estimates based on press releases.

Revenue raising approaches

Ex post *("Making the financial sector pay for crisis resolution")*

Politically, the idea may be to make the financial sector pay

If the purpose of a levy is purely to raise revenues, then the choice of instrument by which that revenue is raised will clearly be determined primarily by its revenue-raising potential, rather than by either its impact on market efficiency or by equity considerations. Nevertheless, governments may decide to raise this additional revenue as much as possible from the financial sector, on the grounds that this sector is associated with the recent financial (and economic) crisis and has benefitted from government support during it. Politically, the idea may therefore be to "make those entities who have contributed to the occurrence of the crisis pay for its resolution".

Collecting funds after a crisis may (also) penalise banks that survived because of their sound management

A key problem when collecting funds after the fact, that is after the crisis has already happened, is that the survivors are not necessarily the ones that were the cause of the problem. *Ex post* funding measures are problematic if they do not distinguish those entities that most likely precipitated the crisis from those that did not, as such measures tend to penalise soundly managed banks that survived the crisis. For example, relying just on variables such as profits or balance sheet size to determine the tax base does not allow one to distinguish between banks that contributed to the crisis and those that did not. On the contrary, taxing current profits or balance sheet growth might penalise the sound and well-managed banks that survived the crisis without major casualty, and are now, as a result of the cautious policies they adopted before the crisis, in a better position than their less-cautious competitors to expand their profit and market shares.

A more general problem with introducing new taxes or extending existing taxes on any particular sector is the question of the real incidence of taxation. Although in this case financial sector firms may be the immediate payers of the tax, it is uncertain whether this cost will ultimately be borne by their shareholders (as perhaps intended) or their customers. Unfortunately, there is very little empirical evidence available that can help answer this question.

Taxes could be seen as an "*ex post*" insurance premium

If the taxes are paid by those banks contributing to the crisis, and which have benefitted from government insurance during the crisis, these taxes can be considered as a form of *ex post* premium paid for that form of support. The proposed Financial Crisis Responsibility Fee in the United States could be interpreted as an example of such a tax. According to that proposal, the tax burden would depend to some extent on the size of the institution, thus making larger entities shoulder a larger part of the burden. The US Administration proposed that the Financial Crisis Responsibility Fee would be left in place until the TARP is fully paid off. According to estimates from early 2010, the total cost of TARP was expected to be around USD 120 billion. Assuming that this amount would be covered by collecting the proposed Financial Crisis Responsibility Fee in equal instalments over 12 years, the annual fee would be equivalent to about 0.07% of 2008 GDP. An updated estimate of the total costs of TARP is USD 50 billion,[6] which might translate to a smaller fee (Figure 8).

Taxes have also been proposed or implemented in other countries (Table A1 in Annex A). There are differences in the structures of the financial sectors and other factors, the type of specific tax chosen, the tax base and rate as well as its coverage, the period over which it will be collected and the specific use of the receipts. Among other things, these differences reflect differences in financial structures, as well as the extent to which domestic financial sectors have received financial support from their governments (and hence the need to collect a "fair" contribution from these sectors).

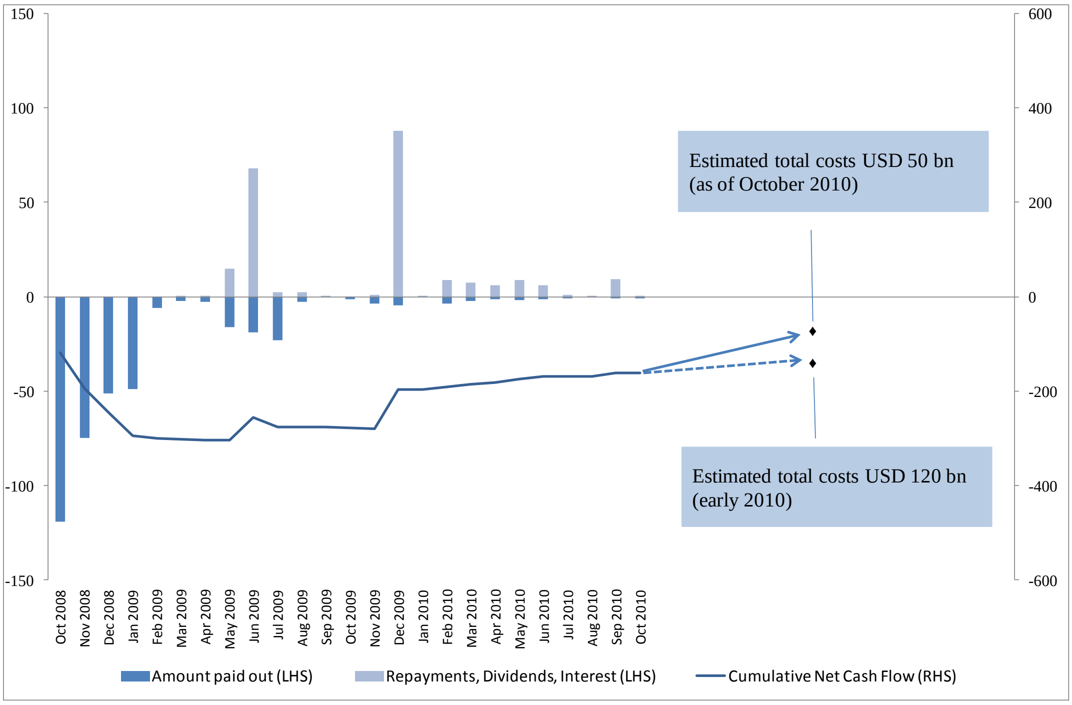
Taxes as ex ante *premiums for financing a resolution fund*

Taxes may also fund future crisis resolution

To the extent that the proceeds of the specific taxes are used for funding a reserve to be available for interventions in future (systemic) crises, they can be conceived of as *ex ante* premiums for future crisis resolution. The frameworks proposed by the IMF and the European Commission, announced in Germany and implemented in Sweden may be examples (Table A2 in Annex A). Some other countries are opposed, however, to the idea of using proceeds to create a separate fund, rather than channelling revenues to the general government budget.

Figure 8. TARP cash flow estimates

In USD billion



Source: OECD Secretariat estimates based on US Treasury's Monthly Congressional Reports, August and November 2010.

In 2009, Sweden introduced a "stability levy" with the proceeds earmarked for a "stability fund" to counteract the effect of systemic disturbance

In 2009, Sweden introduced a "stability levy" consisting of an annual tax of 0.036% on banks' liabilities, excluding equity capital and subordinated debt. The proceeds are earmarked for a "stability fund" envisaged to attain a funding level equivalent to 2.5% of GDP in 15 years (Box 2). Thus, the fund size is considerable if measured in terms of GDP. While the purpose of the *ex ante* fund is to finance measures needed in order to counteract the effect of systemic disturbance (to the financial system in Sweden), it is not meant to eliminate the need to have procedures for *ex post* burden sharing, however, and Swedish authorities are developing related principles.

In 2010, Germany established legislation on bank restructuring, orderly bank resolution, and the establishment of a restructuring fund

In Germany, the Parliament passed legislation on bank restructuring, orderly bank resolution, and the establishment of a restructuring fund in October 2010, with the law envisaged to come into effect at the end of 2010. The objective of the legislation is to ensure the resolvability of any bank, including systemically important ones, while avoiding any significant disruption to the wider financial system and economic activity. It foresees a special reorganisation procedure that systemically important banks could use -- at their own initiative -- to restructure, and it makes available some specific features that are not included in the existing insolvency plan proceedings to facilitate reorganisation. If the reorganisation by the bank is not achieved within a specific timeframe, the supervisory authority is given additional intervention powers. Systemically significant operations could then be transferred to a private buyer or – as a temporary solution – taken over by a public bridge bank. The other, nonsystemic parts could be liquidated in an orderly fashion. The resolution fund should provide the funds necessary for undertaking any such measures. The fund will not merge with deposit insurance programmes, since the focus of the former is on restructuring, while the latter focuses on compensation in case of liquidation.

Box 2. Strengthening existing failure resolution arrangements: The example of Sweden

Systemic resolution funds can be combined with existing deposit insurance funds, or exist separately. In fact, some deposit insurance funds are already characterised by the existence of different accounts, some of which have been designed to either deal with the costs incurred in resolving previous financial crises or to fund efforts resolving future systemic crises. The recently introduced Stability Fund in Sweden is expected to merge with the deposit insurance scheme in 2011, although the purposes of deposit insurance and the Stability Fund continue to be different from another. In this context, it is expected that in a crisis situation, the Stability Fund will be used before the deposit insurance fund, as the latter will be activated only in the final stage of liquidation.

In Sweden, a special Stability Fund was set up in 2009 as a part of the government's stability plan for financial institutions. The purpose of this fund is to finance measures needed in order to counteract the risk of serious disturbance to the Swedish financial system. The Stability Fund is financed ex ante and is consequently forward looking. It is targeted to reach within less than 15 years the equivalent of 2.5 per cent of GDP. The Swedish government has initially allocated funds from the central government budget to the fund (SEK 15 billion corresponding to approximately EUR 1.5 billion), but the aim is that the rest of the financing should be provided by the industry itself. The National Debt Office is responsible for managing the fund. The targeted 2.5 per cent of GDP is an estimate of the net cost of a banking crisis based on experience from earlier domestic and foreign financial crisis. As the short-term need of financing support measures may overshoot the size of the Stability fund, the National Debt Office has the right to grant the stability fund unlimited credit.

All banks and other credit institutions (incorporated in Sweden) are obliged to pay a Stability Fee to finance the fund, which is expected to internalize, at least to some extent, the costs of financial stability and mitigate the problem of moral hazard. The trigger is thus the legal form of the company and not some threshold size. Swedish banks pay for their branches in foreign countries but not for their subsidiaries in those countries. Consequently, foreign banks do not pay for their Swedish branches but their subsidiaries in Sweden will have to pay. The fee, which amounts to 0.036 per cent per year, is levied on certain parts of the institutions' liabilities according to an approved balance sheet. The basis for calculating the fee is all liabilities excluding i) equity capital, ii) junior debt securities that are included in the capital base according to capital adequacy rules, iii) group-internal debt transactions between those companies within the group that pay stability fees, and iv) debt that has been issued under a guarantee program based on the Act. Thus, institutions do not have to pay a fee for risk bearing capital or for liabilities for which they already pay another fee. The Stability Fee can be viewed as being based on a crude measure of systemic risks since the size of the balance sheet, everything else being equal, is positively correlated to the impact and contagion effects.

The National Debt Office is responsible for calculating and deciding the fees for individual institutions. The government intends to make the fee risk-differentiated. The exact design of the risk differentiated fee will be analysed and presented during 2011.

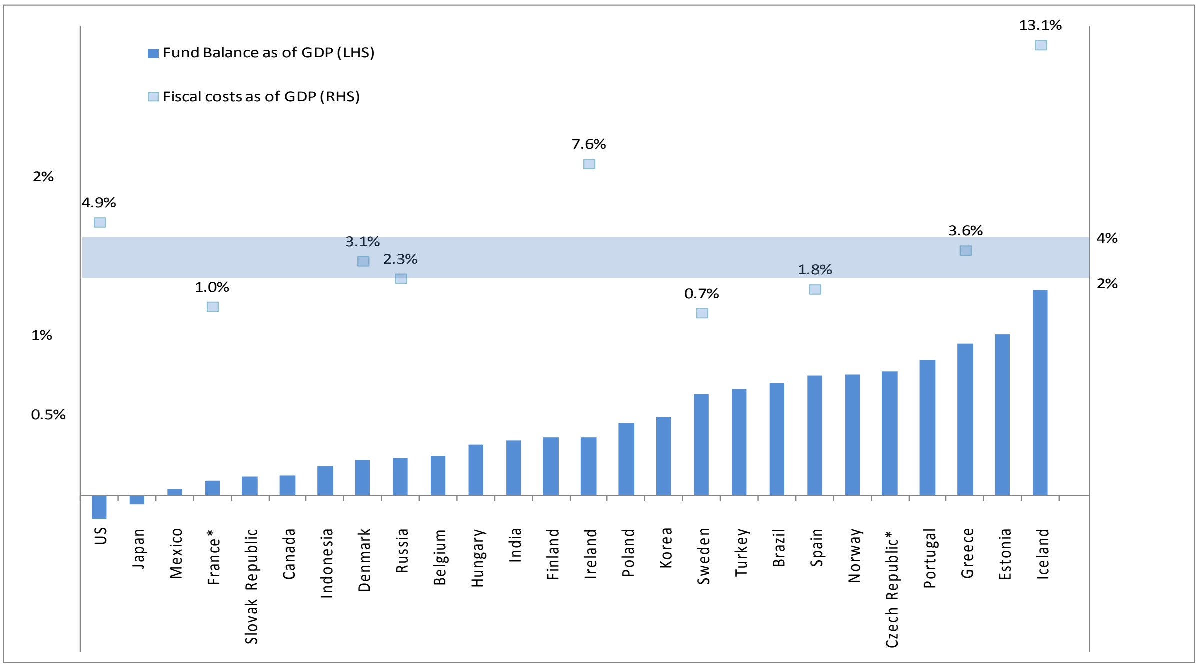
Such approaches are equivalent to capitalising a catastrophic-risk insurance provider

The IMF suggests that systemic crisis resolution funds should aim at a target ratio of 2% to 4% of GDP to be achieved from accumulating taxes over a decade or so. It could be argued that this approach is equivalent to capitalising a catastrophic-risk insurance provider. Prior to the recent systemic crisis, governments had effectively underwritten such catastrophic insurance for the financial system, although they were probably not aware that they were doing so, at least not on that scale. In hindsight, the financial system was not paying enough to the government for the provision of that function.

The target ratios envisaged by the IMF, combined with existing deposit insurance arrangements, would actually be on a level similar to that of the estimated *net* fiscal costs associated with the resolution of the recent financial crises in many countries (Figure 9, albeit showing gross fiscal costs). The funding level envisaged in Sweden is indeed similar to the suggested target ratio, while the level envisaged in Germany is somewhat less "ambitious".[7]

Figure 9. Deposit insurance fund balances and fiscal costs of systemic crisis resolution

Selected schemes, as % of GDP for fiscal year 2009 (crises between 2008 and 2009)



Notes: Deposit insurance fund balances as % of annual GDP. Estimates for jurisdictions marked by * are calculated using 2008 data. Otherwise, 2009 data are used. Estimated (gross) fiscal costs of crisis resolution are similar to those shown in Figure 2; they refer to the period from 2007 to 2009 and are obtained from Laeven and Valencia (2010).

Source: OECD Secretariat estimates based on annual reports of deposit insurers.

Clearly, whether that specific amount ensures that *sufficient* funds are available when the next crisis hits is uncertain, given that the incidence and severity of financial crises are hard to predict. After all, even though systemic crises are a recurrent phenomenon, they occur rather infrequently, which makes it difficult to confidently estimate related probabilities. Moreover, even if many systemic crises share some common features, their costs differ significantly, reflecting among other things the nature and speed of policy responses. Therefore, it is difficult to obtain a reasonable estimate of the "typical" net or gross fiscal costs of crisis resolution. Actually, it is reasonable to assume that *any* specific amount set aside will be insufficient to cover all future crises. But it will *limit* the extent to which the sovereign will incur additional explicit and implicit liabilities from its resolution of a systemic crisis. This advantage should not be underestimated, given that ageing populations and health and social concerns already imply a growing burden on sovereigns arising from the implicit liabilities acquired in this context.

The issue of moral hazard still needs to be carefully considered

The issue of moral hazard still needs to be carefully considered, in particular since the creation of any type of "stability fund" might transform what might still be perceived by some as an exceptional (insurance) response into an entitlement. Also, the mere existence of such a fund, while capable of instilling confidence and hence reducing the risk of small shocks spreading to become systemic issues, might also give rise to a false sense of security, thus increasing risk (HM Treasury, 2009).

Having in place effective resolution mechanisms, public authorities will feel less obliged to provide support for banks

Indeed, recent proposals for forward-looking financial sector contributions typically foresee an improved resolution regime *precisely* to avoid the notion that the funds would be used for bail-outs. Such a regime would enable the resolution of weak financial institutions in a prompt and orderly manner. They would thus expand the tools available to public authorities for dealing with failures among financial institutions and contribute to making bail-outs less likely. By having at their disposal mechanisms for the early and rapid unwinding of financial institutions, public authorities will feel less obliged, for fear of the high cost and the systemic implications of financial-institution failure, to provide fiscal and other support to bank shareholders and unsecured creditors (as arguably was the case in the recent crisis).

Actually, once this principle is established, systemic crisis resolution funds would be similar in principle to deposit insurance schemes. This observation implies that the relationship between any new systemic risk resolution fund and existing deposit insurance arrangements needs to be properly defined. For example, in Sweden, the Stability Fund is expected to merge with the deposit insurance scheme in 2011. In Germany, the two types of systems will not be merged. Despite these institutional differences, there is a view that the functions of these two types of schemes are quite distinct and that the uses of the funds can be clearly separated. According to this latter view, deposit insurance funds would be involved only at the last stage of financial-institution failure, when the entity is being liquidated and depositors are paid off.

The question of how large the coverage of any tax should be is controversial

As in the case of any tax solution, the question of coverage arises in regard to the resolution fund. The views on coverage are quite diverse and perhaps one of the most controversial issues is whether, and to what extent, insurance companies and financial institutions other than banks (commercial and investment) would have to contribute to the funding.

- One view is that the coverage should be wide given the close interconnections among financial institutions and the fact that all financial institutions benefit from effective crisis resolution (IMF, 2010a). Also, singling out a *narrow* group of institutions – such as large commercial banks – could lead to the perception that the entities within that group are less likely to fail than those outside of it, thus perhaps worsening moral hazard. Also, several delegates at the CMF meeting in October 2010 expressed the view that the next systemic financial crisis might not originate in the banking sector, but in the shadow-banking or other financial sector. Thus, wider coverage might be more appropriate.
- Another view, expressed by some delegates at the meeting of the OECD's Insurance and Private Pensions Committee (IPPC), is that it is useful to distinguish between pure insurance and banking

models, and that it is the latter that creates the potential for systemic crises. Given the important conceptual differences between the basic insurance and banking models, this argument seems attractive (Geneva Association, 2010); however, earlier work by the CMF and the IPPC suggests that significant institutional and product convergence, as well as contractual relationships, are blurring the boundaries between *institutions* from the insurance and banking sectors.

Finally, as foreshadowed at the beginning of this section, another controversial issue relates to the allocation of the revenues collected to fund systemic crisis resolution, especially to the extent that revenues are collected *ex ante*. Some policy makers have expressed a clear preference for directing revenues to the general budget as opposed to a specific fund. Directing the proceeds of levies to the general budget provides policy makers with a valuable degree of flexibility regarding the timing and use of funds, but at the same time this carries the risk that those funds may be diverted for other purposes.

Corrective (as well as revenue raising) taxes or levies

Imposing taxes to limit socially undesirable transactions?

Neutrality is rightly the benchmark for tax measures

All taxes and levies distort economic activity to some extent, and whatever type of tax or levy is chosen to finance systemic crisis resolution should be designed to avoid unnecessary distortion. In general, governments should seek to ensure that taxation measures are neutral, in the sense that taxation should not unnecessarily influence financial market decisions. However, there may be cause for taxation measures to depart from neutrality in the case of clearly identified market failures. This raises the question of whether measures that raise revenues in order to finance systemic risk resolution should be designed specifically to address those market failures identified as the cause of systemic risk.

However, a Pigou tax could correct for market failures

A case can be made for imposing taxes in order to limit socially undesirable transactions, especially when more direct means for doing so are unavailable for political or practical reasons. Such a tax is called a Pigou tax after Arthur Cecil Pigou, who proposed correcting market failures, such as negative externalities, by internalising them through taxes. For example, such a tax may be useful in reducing pollution when other means are not readily available.

A systemic risk levy could internalise and thus reduce systemic risks

In this context, a systemic risk levy could be levied on financial firms, which because of their size, interconnectedness or nature of their business are a potential source of instability for the entire financial system. To the extent that regulation alone fails to induce institutions to internalise this risk, a systemic risk levy could help do so, thereby helping to reduce systemic risk (Weder di Mauro, 2010). While the assessment of risk remains an important challenge, the recently revised approach adopted by the FDIC in the United States could be interpreted as an example of such a levy.[8]

Financial transaction taxes

Proposals for financial-transaction taxes may be motivated by attempts to "correct"

Taxes on specific types of financial transactions have existed in a few countries for some time now (Darvas and von Weizsäcker, 2010), and proposals for more widespread uses of such tools have received heightened attention after several financial crises, with the current episode being no exception.[9] Some advocates of financial-transaction taxes argue that such a tax would by definition make frequent, short-term trading more costly compared to long-horizon trading, and thus would help reduce volatility. But the opposite may also occur: Higher transaction taxes (or higher transaction costs, more generally) could reduce liquidity, thus increasing volatility. The empirical literature does not provide unambiguous support for either hypothesis.

However, it would be difficult to target such taxes precisely at "speculative" transactions

A key challenge associated with financial-transaction taxes is that their imposition cannot realistically depend on the motive for particular transactions, and so they would not only affect transactions that might ultimately lead to booms, bubbles and financial crises, but might also affect socially desirable financial transactions, such as the hedging of risk. Distinguishing desirable from undesirable financial transactions is difficult, if not impossible, since identical transactions can involve either hedging or speculative considerations. Another key drawback of financial-transaction taxes is that, to be effective, they would have to be implemented globally, or at least in many countries, but the required international consensus does not seem to exist.

Taxes on remunerations, profits and activities

Further examples of corrective (as well as potentially revenue raising) taxes are taxes levied on bank bonuses

Another example of an intended corrective (as well as revenue-raising) tax is the tax on certain bonus payments in the United Kingdom. The tax, which expired in April 2010, is a one-off tax payable by banks equivalent to 50% of discretionary bonus payments above a specific threshold; it was intended to "encourage banks to consider their capital position and to make appropriate risk adjustments when setting the level of bonus payments above the threshold" (HM Treasury, 2010). It was payable in addition to any income tax, the structure of which was also modified in 2009 for the higher-income brackets. It appears, however, not to have been very successful in changing behaviour. Bonus tax regimes have also been introduced in France and Italy (Table A1 in Annex A).

Several proposals exist, and there is lack of a unified approach across different jurisdictions

In the UK, the Chancellor announced a Bank Levy in the June 2010 Budget. The levy's purpose is to influence bank behaviour and in particular their funding choices, as well as to recover fiscal costs incurred during the crisis. It is to apply to the global consolidated balance sheets of UK banking groups and building societies; the tax base is total liabilities and equity, excluding specific items, such as Tier 1 capital and insured retail deposits, etc. The Government is aware of the possibility of "double-taxation", given the possible existence of similar levies in other jurisdictions and the lack of a unified approach across different jurisdictions. The definition of a "bank" under the current Bank Levy proposal includes the UK branches of banks resident in other countries.

Addressing the tax burden issue

It is too early to determine the effect of recently introduced taxes

The tax incidence, or burden, is uncertain as it does not depend just on who is legally liable for the tax, but on the price elasticity of supply and demand and other conditions, including how widespread the adoption of taxes is among different financial sectors. *Corrective taxes* induce financial firms to internalise the cost of their activities' negative externalities (while collecting revenues). Any such tax necessarily involves a trade-off between revenue raising and the desired shift in behaviour, which – if successful – will reduce the source of revenue. At present, it is too early to determine what mix of behavioural change and revenue raised will ultimately result from these recently introduced bank bonus, liability and profit taxes.

Thus far, judged by the case where a government implemented and subsequently withdrew the tax (United Kingdom), there is little if any evidence suggesting that the new tax succeeded in changing the behaviour of financial institutions. In another case, where a financial activities tax has been introduced at a comparatively high level (Hungary), it remains to be seen to what extent behaviour and competition might change. Concerns have been expressed that financial institutions' behaviour, in Hungary's case that of the subsidiaries of foreign banking groups, might change in unintended ways.

And taxation's potential role has to be seen in the context of the wider issue of taxing the financial sector

The various tax approaches and proposals have to be seen also against the backdrop of an ongoing discussion about whether, and how, to reform taxation of the financial sector. Key issues in this context include the suggestion that taxation generally favours debt over equity financing and that financial sector activities may be under-taxed overall, compared to activities in other corporate sectors, since the application of value-added taxes to the financial sector and its activities is more difficult than for other corporate sectors.

V. New insurance mechanisms inspired by arrangements for catastrophic risks?

Another question is whether, and how, to complement deposit insurance schemes

Yet another suggestion is to complement deposit insurance arrangements with additional insurance-like mechanisms designed to deal with systemic crisis resolution. In the recent crisis, many governments effectively filled the funding gaps of existing deposit insurance arrangements by essentially acting as the insurer-of-last-resort (Schich, 2010). But, since no formal blueprint was available, this function was provided in an *ad hoc* manner. It could be argued that more formal frameworks would help to avoid the additional costs that arise as a result of *ad hoc* policy actions.

Some of the crisis resolution proposals have aspects in common with mechanisms used to fund the resolution of catastrophes

Some of the resolution approaches adopted during the recent crisis have aspects in common with solutions adopted by some countries to fund the resolution of terrorism or other catastrophic risks (Box 3). For example, the asset (loss) protection arrangements adopted by some large financial institutions have parallels with catastrophic risk arrangements. Against the background of these observations, the CMF discussed how relevant and useful the example of catastrophic risk insurance (including nuclear accident risk) might be in providing guidance for designing systemic risk resolution arrangements.

One key premise of policies funding catastrophic risk resolution is that the insurance and reinsurance capacity for natural and man-made catastrophes is ultimately limited. A resulting premise is that the financial management of such risks may be quite difficult for the industry, mainly because of the sheer magnitude of the potential exposure and the inter-temporal mismatch between the size of the annual premiums and the size of the annual expected losses.

Based on that premise, several OECD countries have established specific public-private risk sharing arrangements for catastrophic events at the national level that involve a layered funding structure. This structure typically involves a first layer consisting of deductibles and self-insurance by the private sector, and a top layer provided by the government. Other layers include insurance and reinsurance. Capital markets may also be involved through the issuance of catastrophe bonds.

The latter also attempt to limit, ideally even to fully eliminate, the involvement of taxpayers

Policy objectives in this area expressly include the enhancement of disaster risk mitigation and the reduction of government exposure to catastrophe risk. The long-term goals include minimising the total cost of a catastrophe, consisting of the sum of losses and other costs, such as those of preventive/mitigation measures. Similarly, recent proposals for systemic crisis resolution funds are motivated by the attempt to limit, ideally even to fully eliminate, the involvement of taxpayers in the funding of systemic crisis resolution.

While this basic idea was considered as having value, the relevance in practice was thought to be limited

While the basic idea of complementing existing deposit insurance with new insurance arrangements inspired by existing practises in the area of catastrophic risks was considered to have value, some CMF delegates believed that the idea's relevance in practice would be limited. One difficulty cited was that natural disasters by definition are not caused by institutions, while systemic financial crises result from human actions. Delegates cautioned that any insurance-like solution faces the risk of creating moral hazard and that this issue might be more relevant in the area of financial markets as compared to the area of catastrophic risk.[10]

It should be noted however that the extent of endogeneity in catastrophe insurance situations could easily be underestimated. For example, while natural catastrophes such as hurricanes may be exogenous and beyond the control of the insured, the choice to locate one's home in vulnerable areas is not. Man-made catastrophes and their impact may have even more endogenous influences, including the behavior of the insured.

In any case, the observation that insurance-like mechanisms create moral hazard is non-controversial and widely acknowledged in any insurance context. But there are mechanisms for addressing moral hazard, and its existence is not a fatal flaw. For example, in many insurance products, deductibles and risk-based premium setting are employed to mitigate moral hazard.

Box 3. Financial management policies for large-scale disaster risks

In a number of countries, pursuant to the principle of solidarity - often recognized at the Constitutional level - the mutualisation of losses arising from disaster events is perceived as a fundamental right of the citizens, and the role of the government in the compensation phase is, therefore, considered essential. In other countries, the protection of private property against disaster risks is to a large extent left to the initiative of individuals and the corporations, with a view to emphasizing individual responsibilities, minimising moral hazard, and providing incentives to invest in mitigation measures. Solutions with regard to funding the resolution of realized catastrophic risks differ from one country to another, and from one type of risk to another.

Ex ante solutions include the establishment of dedicated catastrophe funds, market-based or state-sponsored disaster insurance and reinsurance programs, and alternative risk transfers involving securitizations. Once those who are exposed to the catastrophic risks have utilized or been granted access to such tools, in theory, public authorities should refrain from making *ex post* compensation payments to the victims of catastrophes in a way that would undermine those *ex ante* measures. In reality, however, it has turned out to be extremely difficult for public authorities to make a credible commitment that they will not provide compensation once a catastrophe has occurred.

Several OECD countries have established specific public-private risk sharing arrangements for catastrophic events at the national level that involve a layered funding structure, typically with the first layer provided by deductibles and self-insurance by the private sector, and the top layer provided by the government; other layers include insurance and reinsurance. The OECD's Task Force on Terrorism Insurance has promoted the establishment of private-public arrangements at the international level as a complement to the specific public-private risk sharing arrangements for terrorism events that exist already at a national level. But even though the private sector appears to lack the capacity to cover the "mega terrorism risks" identified by that task force, discussions within that Task Force have revealed that *ex ante* international cooperation is not considered equally useful or desirable by all OECD Member countries (OECD, 2005).

International solutions for the financial management of some types of man-made or natural catastrophic risk do exist, however. In the area of nuclear accident risk, a set of international burden-sharing arrangements in the form of several international basic and supplementary Conventions has been established. These arrangements have been refined over recent decades, in part as a response to the occurrence of large-scale disasters. Solutions in the area of nuclear risk reflect the outcome of addressing two policy objectives, which are to protect the public and to limit the liability of the nuclear plant operator. Current arrangements involve a three-tier system in which the (private or public) operator of a nuclear installation covers a specific first layer of total damage, its domestic government the second layer of damage, and all parties to specific international Conventions a third layer of damage. Total coverage is capped at the upper limit of the third layer.

Such solutions at the national and international level, in principle, could provide a reference for current discussions of frameworks for resolving the materialisation of systemic financial risk. As discussed in the main text, however, any insurance-like solution faces the risk of creating moral hazard. Perhaps the issue is even more relevant in the area of financial markets as compared to the area of catastrophic risk, including nuclear accident risk. Hence, the parameters of any insurance-like arrangements need to be designed in a way that they reduce ex ante moral hazard risk, including through appropriately setting premiums and strengthening resolution powers.

VI. Concluding remarks and selected results of discussions

Systemic crisis resolution funds to help ensure more adequate funding

Systemic financial crises are a recurrent phenomenon

Systemic financial crises are a recurrent phenomenon. Despite regulatory efforts, they are likely to occur again. Thus, even if current regulatory efforts were to be successful in reducing the overall costs of any future systemic financial crisis, the question of funding their resolution remains an issue.

The question arises how to fund resolution

The article 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 financial crisis. Systemic crises are, however, not meant to be exclusively dealt with by deposit insurance schemes. Thus, the question arises how to fill that funding gap?

Arrangements such as those introduced in Sweden and Germany are suited in principle to helping ensure more adequate funding

Systemic crisis resolution arrangements that are funded *ex ante*, such as those introduced in Sweden and Germany, are suited in principle to ensure more adequate funding for systemic crisis resolution, at least partly. That said, challenges involved in arrangements with systemic risk levies collected *ex ante* remain and they concern the targeted amounts and destination of revenues (separate fund or general government revenues) and how any funds collected separately would be invested.

But it is difficult to say how much *ex ante* funding is needed to permit effective and credible failure resolution of weak institutions under conditions of generalised stress. Whatever that level is, in a severe systemic crisis,[11] one should not rule out the likelihood that some *ex post* funding will be needed.

The focus of such forward-looking arrangements is on resolution rather than bail-out

Perhaps the biggest challenge for *ex ante* funding arrangements is that, whatever their specific design, they are insurance-like, and this feature may increase moral hazard. In particular, these arrangements could have the effect of transforming what was an exceptional policy response to this crisis into an entitlement. Policy makers are aware of this risk, however, and the approaches adopted or proposed for forward-looking financial sector contributions to systemic crisis resolution typically foresee a new or improved resolution regime precisely to avoid the notion that the funds received would be used for future bail-outs.

Such regimes enrich the arsenal available to public authorities in dealing with failures of financial institutions. They thus reduce the need for bail-outs motivated by the lack of viable policy alternatives, and hence the risk of moral hazard.[12] Previous CMF work has highlighted that, in the absence of tools for the orderly resolution of systemically important financial institutions, policymakers tend to resort to the widespread use of guarantees for financial institutions liabilities and sometimes assets in responding to a systemic crisis. While such measures can be helpful, they are not costless, even when they do not involve significant upfront fiscal costs. Further to potential distortions to competition and incentives, earlier CMF work concluded (Schich, 2008) that the capacity of some governments to provide for the government-supported guarantees for financial institutions could be questioned.

An *ex ante* funded resolution fund has the potential to sever or loosen the relationship between the risk perception of the financial sector and that of the respective sovereign. This feature is attractive especially in situations where stresses from the financial sector adversely affect the credit quality perception of the sovereign, which is what describes the situation in some small countries with relatively large banking sectors in the recent financial crisis.

No one-size-fits-all solution regarding crisis resolution funding

There does not appear to be a one-size-fits-all approach

The results of the discussion of the topic by the CMF was illustrative of the broader ongoing debate on mechanisms to enhance financial stability and deal effectively with financial stability taking place in international forums, including in particular the FSB and the G20. Essentially, the discussion concluded that there is no one-size fits-all solution to funding systemic crisis resolution, with each country choosing a different mix between *ex ante* and *ex post* funding elements.

While representatives from several CMF jurisdictions support the idea of levying a specific tax on banks for funding systemic crisis resolution, that support is not unanimous: Delegates from countries with banking systems that have withstood the recent financial crisis comparatively tend to be more sceptical.[13]

Delegates agree that the financial sector needs to provide a fair contribution toward the resolution costs of the recent crisis

Delegates seem to agree, however, on a broad principle: The financial sector needs to provide a fair contribution to the resolution of the recent systemic crisis, especially where financial institutions have benefitted from government support during the crisis. Thus, in countries where such financial support was provided as part of the policy response to the crisis, special financial sector taxes have been considered. Some countries have imposed or proposed temporary bonus taxes, others levies on profits or on some liabilities, and yet others have adopted more than one of these approaches. Where financial sectors did not rely in a significant way on government support, there has been less support for the idea of introducing specific new taxes.

But even where new taxes have been proposed or adopted to generate revenues *ex post*, the specific approaches have differed. The observation that the different measures adopted have been little coordinated across borders is likely to have resulted in additional costs in terms of potential distortions to competition and incentives. Be that as it may, this observation reflects the fact that there currently exists no blueprint as to how to collect funds (*ex post*) when *ex ante* funding turns out to be insufficient for resolving a systemic financial crisis.

However, views differ regarding forward-looking financial sector contributions intended for crisis resolution

Many current measures can be interpreted as *ex post* funding measures, but the drawbacks of that principle are recognized. In particular, all survivors including the "good" ones are penalized for the behavior of "bad" peers. Moreover, *ex post* funding tends to be more pro-cyclical than *ex ante* funding and could amplify downward pressures.[14] But while policy makers recognise the merits in the principle of *ex ante* funding, not many countries have adopted such an approach (at least not explicitly) by setting up a designated fund. Clearly, to the extent that receipts of financial sector taxes and levies are allocated to the general budget, the fiscal capacity to fund the resolution of a future systemic crisis is also strengthened.

International agreement is most evident as regards the need to strengthen self-insurance

Most policy makers and regulators agree on the need to strengthen self-insurance. In principle, forward-looking financial sector contributions for funding systemic crisis resolution are not substitutes for such efforts, but they could complement them (BCBS, 2010). While neither approach can ensure that funds will turn out to be sufficient, a key difference between these approaches is that strengthening self-insurance implies that buffers remain within the financial institution, while the other approach does not provide for this. A majority of regulators seems to believe that the focus of internationally coordinated efforts to limit the risks and costs associated with financial instability should be primarily on requiring larger and better buffers at the level of individual institutions, as opposed to building up separate systemic crisis resolution funds.

The need for global consistency of national choices

Global consistency in the approaches used to fund systemic crisis resolution would be helpful

Global consistency in the approaches used to limit the probability of systemic crises, as well as the funding of their resolution, is needed in order to avoid regulatory arbitrage and other potentially undesired consequences. In particular, distortions to competition and incentives could arise from "double-taxation" or the application of different tax bases and rates across countries and financial sectors. In this context, it was pointed out by one CMF delegate that levying a tax on balance sheets or bonuses at the national level, as compared to a financial-transactions tax, has the advantage that it requires a more limited degree of international coordination in order to be effective.

As regards imposing systemic capital surcharges, international convergence is being achieved within the Basle capital adequacy framework. By contrast, as regards imposing systemic risk taxes or levies, it appears to be more difficult to achieve agreement that has international stature. The various international discussions on this issue, including within the CMF and the G20,[15] suggest that achieving some form of international arrangement in this area is not seen as a high priority. That said, there appears to be some support for developing general principles that would guide specific national choices in the area of systemic crisis resolution.

Note

1. The document discussed by the Committee on Financial Markets drew on two previous works. The first is an issues note prepared by the first author for the CMF meeting in April 2010 and presented at the CMF meeting in April 2010 and the Insurance and Private Pensions Committee (IPPC) meeting in July 2010. The second one is a presentation given by that author at the Warwick Banking Law Symposium in 2010, which will be included as an article in a forthcoming Conference volume.

2. In particular, the use of at least three out of six specific policy measures qualifies the second criterion. The measures consist of i) deposit freezes and bank holidays ii) extensive liquidity support iii) significant bank restructuring costs (exceeding 3% of GDP) iv) bank nationalisations v) guarantees and vi) asset purchases (exceeding 5% of GDP).

3. Different estimation approaches lead to different systemic crises dating, and there is no widely accepted method. Some alternative approaches are reviewed by the Basel Committee on Banking Supervision (2010).

4. Even where no significant upfront fiscal costs are involved, the extensive use of government-supported guarantees to support financial institutions is not without cost (Schich, 2009).

5. In some cases, this ratio was even negative, meaning that the fund had negative equity. For example, in Japan, reflecting the effects of the country's banking crisis, the deposit insurance fund has been characterised by a negative reserve ratio since fiscal year 1996, although the ratio has improved since fiscal year 2004. In some other countries that experienced very significant banking crises in recent decades, such as Korea and Mexico, separate accounts have been established for dealing with the legacy burden resulting from those crises and for funding ongoing resolution activities. The data shown in Figure 5 refer to the accounts that are funding ongoing resolution activities.

6. United States Department of the Treasury, Office of Financial Stability, Troubled Asset Relief program: Two Year Retrospective, October 2010.

7. The first author of this paper had acted as an expert witness in the hearing by the Finance Committee of the German Parliament of the new German bank restructuring law and has drawn attention to the differences in funding levels between Sweden and Germany. The example is also developed in the related written statement to the proposed law, which is available (in German language) at http://www.bundestag.de/bundestag/ausschuesse17/a07/anhoerungen/2010/029/Stellungnahmen/27_Schich__Dr__Sebastian.pdf . In particular, based on the current projected annual revenues of somewhat more than one billion Euro for the German restructuring fund, simple back-of-the-envelope calculations suggest that a funding level of 2.5% (envisaged after 15 years in Sweden) would not be reached before 50 years in Germany. And it would take Germany almost two decades to achieve a level equivalent to the capital injection actually provided in this financial crisis to one major bank in Germany, provided of course that no other outlays occur in the meantime.

8. The FDIC proposed two rules that would amend the FDIC's deposit insurance assessment regulations. The first proposed rule (the "Asset Based Proposal") would implement a provision in the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd‑Frank Act") that changes the assessment base for insured depository institutions ("IDIs") from domestic deposits to assets. The second proposed rule (the "Large Bank Proposal") would re-propose changes for the deposit insurance assessment system for large institutions given the Dodd-Frank Act's changes to the assessment base. See "FDIC proposes amendments to deposit insurance assessment regulations", Goodwin Procter LLP, 16 November 2010.

9. For recent surveys of such proposals see *e.g.* Darvas and von Weizsäcker, 2010; TUAC, 2010; IMF, 2010a. The IMF, tasked by the G-20 to explore a wide range of options as to how the financial sector could make a fair and substantial contribution, considered the possible use of financial-transaction taxes; its report, however, favoured a tax on financial activities as levied on financial institutions' profits and wages. That said, the report did not rule out the use of financial-transaction taxes for other purposes (Matheson, 2010).

10. As regards potential lessons to be learned from existing insurance arrangements in other areas, a specific suggestion from one CMF delegation was to focus on arrangements in the area of animal disease as an alternative to catastrophic risk arrangements.

11. One view expressed at the CMF meeting was that to the extent that current regulatory changes imply that more significant buffers will be available at the level of individual institutions, the next financial crisis could be expected to be less costly.

12. Earlier work by the CMF on the policy response to the financial crisis, consisting of the government providing the guarantor of last resort function (Schich, 2009), emphasised the relevance of the moral hazard risk associated with that response.

13. The Committee on Financial Markets (CMF) held a first discussion on this issue at its meeting in April 2010 and agreed to continue its discussion of these issues in the future, in particular, after the IMF report for the G20 was issued, which occurred as expected in June 2010. It held a second discussion on this issue in October 2010.

14. Another relevant parameter influencing considerations regarding any tax or levy in the current context is the expected strength of real economic activity over the near term. In particular, continuing concerns about the strength of activity in some major countries have implied that policy makers have been carefully considering the possible effects of any additional surcharges that might have adverse near-term effects on the profitability, and, perhaps the capacity, of banking sectors to perform essential financial intermediation functions.

15. Based on a report that was delivered by the IMF to the G20 in June 2010, the G20 "*agreed the financial sector should make a fair and substantial contribution towards paying for any burdens associated with government interventions, where they occur, to repair the financial system or fund resolution, and reduce risks from the financial system. We recognized that there are a range of policy approaches to this end. Some countries are pursuing a financial levy. Other countries are pursuing different approaches"* (G-20 TORONTO SUMMIT DECLARATION, 27 June 2010). The specific choice of wording adopted suggests that the G20 will not strongly pursue efforts to achieve some form of *international* arrangement in this area, although it leaves open the possibility for each country to adopt whatever approach it considers most suitable given its specific circumstances. The G20 Seoul Summit Leaders' Declaration of November 2010 does not include a specific reference to levies, although the Seoul Summit Document, in its section on "financial sector reforms" sets out a "multi-pronged framework" for addressing the issues arising from systemically important financial institutions, which includes "*other supplementary prudential and other requirements as determined by national authorities which may include, in some circumstances, liquidity surcharges, tighter large exposure restrictions, levies and structural measures*".

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ANNEX A

Table A.1. Examples of proposals or approaches for *ex post* revenue generation, including corrective taxes or levies

	United States	Hungary	Austria	United Kingdom		France		Italy	IMF
Name (status)	Financial Crisis Responsibility Fee (proposal; 14 Jan 2010)	Bank levy (adopted in the parliament; 22 July 2010)	Bank levy (proposal; 22 Feb 2010; details 23 Oct 2010)	Bank levy (proposal; 22 June 2010; details 13 July 2010)[1]	Bank Payroll Tax (active; 9 Dec 2009)	Temporary Bonus Tax (active; 10 Mar 2010)	Bank levy[3] (proposal; 29 Sep 2010)	Permanent Bonus Tax (active; 1 Jan. 2010)	Financial Activities Tax (proposal, June 2010)
Coverage	Large banks, thrifts, brokers, securities dealers, insurance companies and holding companies of those entities (with assets exceeding USD 50 billion)	Banks, insurance companies and other financial institutions	Banks	Banks and building societies, UK branches and subsidiaries of non-UK banks, with liabilities exceeding GBP 20 billion	Banks, investment companies, building societies	Banks, credit institutions, investment firms except asset management firms	Banks, credit institutions, investment companies, other financial companies with equity of more than EUR 500 million	Banks and other financial institutions	All financial institutions
Rate	0.15% of liabilities	0.5% of assets over HUF 50 billion and 0.15% on the part below the threshold	0.04% to 0.08% of assets depending on size	0.04% in 2011 and rising to 0.07% in 2012 and thereafter of liabilities.[2]	50% of bonus payments	50% of bonus payments	0.25% of minimum equity	10% of bonus payments	Not specified
Base	Assets minus Tier1 capital minus insured deposits	Assets	Assets	Total liabilities minus Tier 1 capital minus insured deposits minus repos secured against sovereign debt	Excess bonus payments over GBP 25,000	Excess bonus payments over EUR 27,500	Minimum equity required as set out by the supervisor to meet reserve ratio requirements	All bonuses and stock option gains exceeding 3times managers' fixed remuneration	(Excess) profits and (high) remuneration

	United States	Hungary	Austria	United Kingdom		France		Italy	IMF
Estimated size per year (as of 2008 GDP)	Assuming total losses to be compensated to be USD 117 billion over 12 years implies a levy of about 0.07% of GDP per year	HUF 200 billion per year (0.7%)	EUR 500 million per year (0.2%)	GBP 2.5 billion per year (0.2%)	GBP 2 billion (0.1%)	EUR 360 million (0.02%)	EUR 504 million in 2011(0.03%)	EUR 10 million per year (0.006%)	Not specified
Period effective	Around 10-12 years (until estimated losses from TARP are fully paid off)	3 years	Not specified	Not specified	One year (bonuses paid from 9 Dec 2009 to 5 April 2010)	One year (accounting year 2009)	Not specified	Not specified	Not specified
Use	General government revenue (to recoup the costs of TARP)	General government revenue	General government revenue	General government revenue	General government revenue	Earmarked for public agency supporting innovation and SMEs	General government revenue	General government revenue	General government revenue

1. On 13 July 2010, the UK Treasury published a Consultation Document on the proposed UK bank levy setting out details of the UK Government's proposed approach to the Levy, and on 9 December 2010 a draft legislation based on the consultations.
2. The draft legislation published on 9 December foresees a bank levy with revised rates, that is a rate of 0.05% for 2011and 0.075% from 2012 onwards, respectively.
3. The French government announced the plan to introduce bank levy together with UK and Germany on June 2010, and details were presented in the Finance Bill 2011

Sources : IMF(2010a); EC (2010c); The White House, Financial Responsibility Fee Fact Sheet at *http://www.whitehouse.gov/sites/default/files/financial_responsibility_fee_fact_sheet.pdf* ; FT.com, "Bank tax voted through'", 28 July 2010; Budapest Times, "Austria Agrees to Bank Levy", 3 November 2010; Tax-News.com; HM Treasury (2010) "Bank levy", HM Revenue & Customs "Bank Payroll Tax; Clifford Change "French Tax on Bank Bonus" (11 March 2010); "French Bank Tax", Pricewaterhousecoopers Oct 2010, http://www.pwc.com/en_MT/mt/publications/France_Bank_Tax.pdf

Table A.2. Examples of proposals or approaches for the *ex ante* funding for future crisis resolution

	Germany	**Sweden**	**European Commission**	**IMF**
Name (status)	Restructuring Fund (proposal; cabinet approval 25 Aug 2010, details 30 June 2010)	Stability Fund (active, 1 Aug 2009)	Bank Resolution Fund (proposal; 26 May 2010)	Financial Stability Contribution (proposal, June 2010)
Coverage	Banks	Banks	Banks and investment firms	All financial institutions
Rate	0.02 – 0.04% (increasing with size of bank). Plus 0.00015% on the value of derivatives held off balance sheet.	0.036%	Not specified	Less than 0.2%
Risk-weighted	Yes. Estimated contribution to systemic risk.	Not initially. Yes, in the future.	In principle, but details not discussed.	Not necessarily initially. Yes, in the future.
Base	Total liabilities minus liabilities owed to customers and "liable" equity.	Uninsured liabilities	Preferably based on liabilities but Commission is still considering alternatives.	Uninsured liabilities including off-balance sheet items.
Size	Collecting about EUR1.2 billion per year (less than 0.05% of GDP annually)	2.5% of GDP after 15 years	Not specified	2-4%of GDP target level
Period for building up funds	Not specified	15 years	Not specified.	About 10 years
Use	Resolution	Financing government measures such as capital injection, loans and guarantees to support financial system. Expected to be merged with deposit insurance in the future	To facilitate orderly resolution (where feasible, co-ordinating with local deposit guarantee fund), covering i) the financing of a bridge bank, ii) the financing of total or partial asset and/or liability transfers, iii) the financing of a good bank/bad bank split and iv) administrative costs, legal and advisory fees.	Provision for the net fiscal cost of direct support to the financial sector

	Germany	Sweden	European Commission	IMF
Investments	Not specified	Remunerated government account	Geographically well diversified portfolio in highly liquid non-bank assets with low credit risk in support of real economy.	Not specified. But it is assumed to invest in government securities
Government backstop	Not specified	Unlimited	Not specified	Contingent credit line by the government will be needed. In this case, a separate additional fee is required to be paid by the industry

Sources : Bundesfinanzministerium, *Entwurf eines Gesetzes zur Restrukturierung und geordneten Abwicklung von Kreditinstituten, zur Errichtung eines Restrukturierungsfonds für Kreditinstitute und zur Verlängerung der Verjährungsfrist der aktienrechtlichen Organhaftung (Restrukturierungsgesetz)*, available at *http://www.bundesfinanzministerium.de/nn_82/DE/BMF__Startseite/Aktuelles/Aktuelle__Gesetze/Gesetzentwuerfe__Arbeitsfassungen/20100825-Gesetzentwurf-Restrukturierungsgesetz__anl,templateId=raw,property=publicationFile.pdf;*
IMF(2010a); European Commission (2010b)