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IN-DEPTH ANALYSIS

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External author: Martin Hellwig
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Provided at the request of the
Economic and Monetary Affairs Committee

ECON

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Provided in advance of the public hearing
with the Chair of the Single Resolution Board
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Abstract

The paper discusses the role of risk weighting in the determination of minimum requirements for eligible bail-in-able liabilities of banks (MREL), i.e. liabilities that are not exempt from the bail-in tool in bank resolution and that can be written down or converted into equity if losses on assets exceed the available equity and such bailing-in is required to re-establish bank solvency so as to provide a basis for maintaining systemically important operations in resolution. The paper begins with a general discussion of the reasons for introducing bank resolution as a special procedure outside of insolvency law, of the reasons for having the bail-in tool and of the frictions that may stand in the way of successful and frictionless resolution. This discussion emphasizes the importance of having sufficient bail-in-able liabilities available; in contrast, for large institutions that have access to bond markets, the social costs of such requirements are small (unlike the private costs to the banks themselves). However, neither risk weighted nor total assets provide proper guidance for determining MREL. Risk-weighting suffers from a lack of a proper statistical basis and a certain manipulability. Moreover, the risk weighting that is used for capital regulation is not well suited for determining MREL; whereas capital regulation focuses on the probability of bad results, MREL is concerned with the extent of losses conditional on results being bad. "Total assets" suffer from not truly representing total assets because various rules, e.g. for netting, allow banks to keep certain assets and liabilities off their balance sheets.

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LIST OF ABBREVIATIONS

BRRD	Bank Recovery and Resolution Directive
EBA	European Banking Authority
FSB	Financial Stability Board
MREL	Minimum Required Eligible Liabilities
SME	Small and Medium Enterprises
TLAC	Total Loss Absorption Capacity

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EXECUTIVE SUMMARY

The European Union's Bank Recovery and Resolution Directive (BRRD) of 2014 has introduced the bail-in tool as a means of making creditors of banks participate in banks' losses that exceed their equity. The tool is applied in resolution, i.e. outside the traditional insolvency framework. Whereas some liabilities of banks are exempt from being bailed in, the Directive calls on resolution authorities to specify minimum requirements for eligible bail-in-able liabilities (MREL). The question is whether these requirements should be determined in relation to a bank's total assets or in relation to their risk weighted assets, as used in assessing capital requirements for banks.

The paper discusses this question against the background of the BRRD's objective and the crisis experience that gave rise to the BRRD. The key to the viability of resolution is the ability to deal with bank problems quickly and without frictions. For the bail-in tool, this means that eligible liabilities must be sufficient to cover losses so that after write-downs and conversions of these liabilities the solvency of the bank is beyond doubt, liquidity provision is unproblematic and equity is sufficient to allow the maintenance of systemically relevant operations under existing capital regulation.

For small banks that do not have access to capital markets, the MREL regulation may reduce the extent to which they can provide liquidity transformation. For large banks with access to bond markets, this is not a concern. For such banks, the costs of minimum requirements for bail-in-able liabilities are mainly private costs that are matched by benefits elsewhere in the system, in particular benefits to taxpayers. The difference between banks suggests a regulatory approach that discriminates between types of banks, introducing a Pillar I approach for large banks, in particular for systemically important banks while keeping the current Pillar II approach for small banks, in particular small banks that are not systemically important.

The paper is skeptical about a reliance on risk-weighted assets. Even for capital regulation, risk weighting is problematic because the statistical basis for doing the risk analysis properly is sorely lacking and in practice risk weights can be used to manipulate the regulation. Major risks are in fact not adequately considered at all.

In setting MREL, there is the added concern that prior probabilities of investments going sour are much less important than in capital regulation. What matters is the extent of losses once things go poorly and the conditional expectations given this event of returns on those investments that do not yet seem to be impaired. Relying on the same risk weights as for equity regulation is likely to be a serious source of distortions, but procedures for doing the requisite risk analysis properly are even less satisfactory.

At the same time, "total assets" suffer from not representing total assets. Because of netting rules and other privileges, important risks do not actually appear in banks' balance sheets.

Given these problems, the dual approach suggested by the Financial Stability Board, namely refer to both risk-weighted and total assets and impose the stricter of the two requirements, seems like the most reasonable way forward.

A quantitative assessment suffers from a lack of data about the institutions where a choice between risk-weighted and total assets for MREL would make a difference (unlike globally systemically important institutions for which the FSB mandates that both be used). Since risk weighting is particularly important in the context of real estate loans and in the context of sovereign exposures, a proxy measure is obtained by consider the distribution of these exposures. While the overall effects are likely to be small, they are particularly pronounced for Italy and Spain where public debt and sovereign exposures of banks have gone up significantly during the crisis.

1. INTRODUCTION

The bankruptcy of Lehman Brothers in September 2008 created turmoil for the global economy, inducing governments and central banks of major countries to provide other financial institutions with substantial support in order to stop the downturn. Since then, many reforms have been introduced to improve the legal and regulatory framework within which financial institutions operate. While much effort has gone into trying to reduce the likelihood of banks' getting into such straights as require corrective actions (resolution, insolvency procedures) by authorities, some reforms also aim at improving the likelihood that such corrective actions might proceed smoothly, without imposing too much damage on the financial system and the overall economy. In particular, the European Union's Bank Recovery and Resolution Directive (BRRD) of 2014 provides a legal framework for bank resolution.

The BRRD provides several resolution tools. The bail-in tool provides the authorities with the scope for writing down debts or converting them into equity on the basis of an initial assessment of losses without having to go through an insolvency procedure. The objective of the action is to quickly re-establish the bank's solvency so that it can continue operating under existing equity requirements without interrupting systemically important operations..

In principle, all bank liabilities are subject to bail-in. However, the BRRD also exempts certain classes of debts from bail-in. These exemptions raise the possibility that the remaining equity and bail-in-able debt that are available in resolution may not be sufficient for the purpose they are meant to achieve. To avoid such a situation, the BRRD imposes the requirement that bank funding must involve a minimal amount of equity and bail-in-able liabilities (MREL). The amount itself is not specified in the BRRD itself, but must be determined by the responsible authority under standards defined by the European Banking Authority (EBA).

The standards proposed by EBA (2015 a) are given in terms of the risk-weighted assets, rather than the total assets of a bank. Risk weighting, i.e. the calibration of regulatory requirements to the assessed risks in the bank's balance sheet, has a long tradition in the regulation of bank capital, where according to one line thought regulation calibrated to total assets is deemed unsatisfactory.

The BRRD does not actually specify whether the requirements for bail-in-able liabilities should be specified in terms of risk-weighted or in terms of total assets. In Article 44, it does however stipulate that funding from resolution financing arrangements can only be obtained after equity and bail-in-able debt amounting to 8% of total assets have been bailed in.

If this threshold is taken to provide a standard for the authorities should aim for, the approach taken by EBA raises the question of how the requirements in terms of risk-weighted assets relate to the threshold of 8% of total assets in Article 44 of the BRRD. EBA (2015) glosses over this question by asserting that "regulatory capital requirements and buffers already reflect the judgement of the supervisor and legislators about the level of unexpected losses an institution should be able to absorb" without commenting on the fact that capital requirements and buffers on the one hand and MREL on the other hand refer to different situations.[1]

Meanwhile, the G20 have adopted the Financial Stability Board's (FSB) proposal that globally systemically important institutions be required to have total loss absorption capacity equal to the maximum of 6.75% of total assets and 18 % of risk-weighted assets[2]. "Total loss absorption capacity" (TLAC) here refers to the equity and bail-in-able debt that are available for write-down or conversion at the point of resolution. The FSB requirement thus is given in terms of both, total assets and risk-weighted assets, whichever is more stringent. In addition, the FSB treats the TLAC requirement as

[1] EBA (2015 a), p. 7.
[2] From 2022, 16% from 2019.

an add-on to capital regulation. Equity and hybrid instruments that count towards TLAC requirements cannot also be used for capital buffers.

The European legislator is called upon to incorporate TLAC requirements into the legal framework for bank regulation and bank resolution. Given that MREL and TLAC serve essentially the same purpose, it seems desirable to homogenize the rules. In the process, the question arises how to deal with the different approaches to specifying the requirements, in terms of risk-weighted or in terms of total assets.

The following text provides some of the concerns that this question raises. It does not provide an impact assessment but merely spells out some of the conceptual issues that are involved and draws attention to some of the danger points.

2. GENERAL CONSIDERATIONS

2.1 Where do we come from?

In a free market economy, private individuals and firms have a great deal of autonomy over the decisions they take. While being autonomous in their decisions, they also bear – or have to bear – the consequences. If the results of their decisions turn out well, they obtain the benefits, if the results turn out poorly, they bear (most of) the costs.

This principle underlies most of the legal rules governing economic activities, including traditional insolvency law. To be sure, *ultra posse nemo obligatur*, a debtor who is insolvent cannot be made to pay his debt, but this is a risk that creditors knew or should have known about when they lent to the debtor. Holding creditors responsible for the consequences of their actions, traditional insolvency law makes them share in losses that exceed the debtor's ability to pay.

When the financial crisis began, in 2007/08, in most countries, financial institutions were subject to insolvency law or to special laws that paralleled insolvency law.[3] In the crisis, however, these laws were not applied. Given the turmoil that was triggered by the bankruptcy of Lehman Brothers, governments and central banks were apprehensive about systemic risks and preferred to support problem banks by providing equity, debt guarantees, and liquidity support in order to avoid an intervention that might unleash even more turmoil.

The bailouts that were thus provided saved creditors of banks and other financial institutions from losses they would have made under standard insolvency law. The beneficiaries included not only insured depositors (or the deposit insurance institutions) and holders of senior debt, but also the holders of junior and subordinated debt, including those hybrid forms of debt that had been treated as Tier 2 or Tier 1 Equity under the Basel regime of equity regulation. An extreme example is the German bank Hypo Real Estate, where even the shareholders received € 1.30 per share, while the government is likely to end up with losses on the order of € 20 billion.

Fears of systemic risk governed attitudes towards banks in difficulties for a number of years so that banks and their creditors got used to the notion that they almost have a right to be bailed out. However, the budgetary costs were large, and public revulsion was intense. In the Irish and Greek banking crises, the bailouts, including bailouts of shareholders and subordinated creditors (Greece) and of senior unsecured creditors (Ireland) contributed substantially to the very large fiscal costs.

Extensive bailouts also prevented exit of institutions from the market. Exit however, would have been needed to eliminate excess capacities. From the mid-1990s until the financial crisis, we have had an enormous growth in the European financial sector, creating excess capacities and making it difficult for banks to earn profits unless they took unconscionable risks.[4] Not eliminating these excess capacities may end up as a source of substantial risk in the future. In the United States, there has been relatively more exit, i.e., more bank closures and this despite the fact that the previous capacity expansion had been less extensive than in Europe.[5]

Anticipations of bailouts create distortions. Creditors who expect to be bailed out by taxpayers provide bank funding without sufficient charges for risks, i.e. bank funding is subsidized at the

[3] For example, under the German Kreditwesengesetz, dealing with banks in difficulties was the prerogative of the supervisor, but interventions were governed by the principle of creditor protection, which was interpreted along the lines of insolvency law, without concern for systemic risk. For a detailed discussion, see Hellwig (2012).

[4] For example, in covered bond finance, competition on margin was so intense that participants could only succeed in the market if the used very short-term funding for the excess coverage, i.e. the excess of their mortgage and debt portfolios over the value of the covered bonds. This is why the banks Dexia and Hypo Real Estate got into trouble almost immediately when money markets froze after the Lehman bankruptcy.

[5] On the growth of banking in Europe and the US before the crisis, see ASC (2014).

expense of other forms of funding. Some of this gain may accrue to loan clients through lower loan rates but then the loan rates are distorted downward and do not reflect the real costs of lending. Because of other distortions, in particular in lending to small and medium enterprises (SMEs), such downward effects on loan rates may be deemed to be politically desirable, but then it would be cheaper and more effective to provide direct subsidies, e.g. for SME lending, rather than wholesale explicit or implicit guarantees for banks' creditors.

It is therefore important and welcome that the BRRD (and the SRM) impose limits on bailouts. The bail-in tool of the BRRD and the minimum requirement for eligible securities make an important contribution to this purpose. Any assessment of their implementation must be guided by this objective.

2.2 Objectives of the bail-in tool and MREL

The BRRD is based on the principle that problems in financial institutions should be resolved without any recourse to taxpayer money. The mere announcement of such a principle is not enough to ensure that it will actually be implemented. After all, the legislation prevailing in 2008 was based on the same principle. However, in the crisis, it seemed preferable to support banks with public guarantees and public money rather than rely on the existing legal rules.

To avoid a repetition of this experience, the BRRD provides three innovations: First, it institutes the recovery and resolution procedure, with clear rules and responsibilities and with an explicit mandate to take care of systemic risks. Ideally, this procedure would avoid the pitfalls and uncertainties associated with insolvency procedures and their analogues that are dominated by concerns for creditor protection.

Second, it exempts certain classes of bank liabilities from sharing in losses that exceed the loss absorption capacity of equity. The hope is that this exemption will eliminate the risk of a run, thereby stabilizing bank funding.

Third, it asserts the principle that all other liabilities are bail-in-able, and it asks authorities to impose minimum requirements for bank funding by eligible bail-in-able liabilities (MREL). The hope is that, by means of write-downs on bail-in-able debt and/or conversion of bail-in-able debt into equity, concerns about a bank's solvency are quickly dealt with, so that the bank is regarded as viable again, by markets as well as supervisors.

For this procedure to work, the available bail-in-able debt must be sufficient to cover losses on assets that exceed the original equity. Indeed it must exceed these losses by the amount needed to provide for the equity that the bank needs to be regarded as viable, by regulators and counterparties.

If sufficient bail-in-able debt is available and if the bail-in procedure works smoothly, then, ideally, a recovery and resolution procedure can be implemented without any systemic repercussions. As the bail-in-able debt is written down or converted into equity, the solvency concerns disappear and either the bank becomes trustworthy again to its counterparties or it can obtain access to emergency liquidity assistance from the central bank.

Continued funding is essential to ensure that systemically important operations can be maintained. Moreover, for banks such as BNP-Paribas or Deutsche Bank, with quadruple-billion-euro balance sheets, the available resolution financing arrangements are too small for this purpose. The BRRD is silent on this issue, presumably because it takes the success of the bail-in operation (or the other tools) for granted so that, even if markets do not regain, there are no concerns about central bank funding. It is all the more important to have sufficient bail-in-able liabilities.

And if the bank is wound down, the availability of sufficient bail-in-able debt ensures that losses can be attributed to eligible claimants without violating promises of protection and without calling on taxpayers. This latter consideration is also important if the bank is sold for a price below the face value of outstanding debts or if the bank's assets are put into a bridge bank, whose value may end up being less than the face value of outstanding debts.

The BRRD does not actually specify a number for the requirement. It does however stipulate that resolution financing arrangements can only be tapped after equity and bail-in-able debt amounting to 8% of total assets have been bailed in.

2.3 Impediments to the viability of resolution and the use of the bail-in tool

If we are to avoid a repeat of the 2008 experience where the authorities were afraid to apply existing law because the systemic repercussions seemed too frightening, it is important to eliminate as many impediments to a frictionless resolution as possible. The following concerns are important:

- The amount of bail-in-able debt might not be sufficient to cover losses and enable a recapitalization. In this case, the authorities might be tempted to delay resolution in the hope that the situation might improve. In many instances, such hope is vain, and the delay only serves to magnify losses and costs. In particular, during the period of delay, short-term creditors might withdraw funding, causing a liquidity squeeze, or they might ask for additional collateral, thus reducing the amount of unencumbered assets that provide the counterpart to the bail-in-able debt.[6]

  Alternatively, the authorities might be tempted to engage in a less than thorough assessment of asset values and write-downs in resolution, fitting the write-downs to the loss absorption capacity that is available. If investors suspect anything of the kind, they will not trust the resolution procedure and withdraw their funding, creating a liquidity squeeze. Liquidity can be provided by the central bank, but then the central bank is also, or should be, concerned about the solvency of the institutions.[7]

- If bail-in-able debt is held by other financial institutions and if these institutions are deemed to be vulnerable, the authorities may be afraid of domino effects of the bail-in. For this reason, the Liikanen Report (2013) had recommended that investment in bail-in-able liabilities should be limited to institutions that do not pose systemic concerns. However, in this respect the BRRD falls short of the recommendations of the Liikanen Report. This shortcoming may end up destroying the viability of resolution without taxpayer money.

  Similar concerns may arise if the bail-in-able debt is held by retail customers who have not been told about the risks. Mis-selling of securities may be a reason for courts' invalidating the contracts, as happened in Spain in 2012 with preferential shares sold to retail customers with promises of extra returns with not much of an additional risk. If the bail-in operation becomes a subject of legal proceedings, the viability of resolution is seriously in doubt.

- For banks with systemically important operations in multiple jurisdictions, multiple-point-of-entry resolution, i.e. a procedure that has each legally independent subsidiary resolved by the

[6] On the dangers of excessive „forbearance", see ASC (2012).
[7] The importance of liquidity in resolution is stressed in Hellwig (2014).

institutions of the host country, would break up operations that are carried out in an integrated fashion across the entire organization, e.g. cash management or the management of IT systems.[8] Single-point-of-entry resolution, for example at the level of the parent company, would avoid this problem, but then the question is why host country authorities would trust the home country authorities to deal fairly with issues of distribution between countries. To the extent that this question involves the attribution of existing losses, it can be mitigated or even eliminated by internal bail-in-able debt contracts between the different units, e.g. the parent holding bail-in-able claims on a subsidiary, which are written down in response to losses exceeding the subsidiary's equity.[9] In this context the same considerations of viability arise as for external bail-in-able debt: There must be enough of it, and it must be easily written down or converted to that there is no scope for mistrust to harm the resolution procedure.

The importance of these concerns will differ across institutions and across situations. Resolution of a small bank without systemically important functions or connections is not likely to pose much of a problem; probably such a bank could even be handled under traditional insolvency law without much difficulty. Resolution of a large systemically important bank is more of a concern, but, if the rest of the financial system is healthy, it may be easy to sell the bank, as a whole or in parts, without causing much turmoil.

Systemic concerns are most important if many banks are in trouble and several of these are systemically important. In this case, as shown by the example of Lehman Brothers, an intervention by the authorities that interrupts systemically important operations and that forces other institutions to acknowledge losses is likely to shake investor confidence even further, so it is all the more important that the operation be done smoothly and without leaving any doubt as to the thoroughness of the cleanup.

These considerations indicate that any assessment of preparations for resolution must be carried out from an ex post perspective, with reference to a situation in which losses have already been incurred and the institution is in trouble; moreover, some attention must be paid to the possibility that other institutions might also be in trouble and the intervention might trigger significant contagion.

As I will explain in more detail below, such an ex post perspective is important for a proper assessment of risk weighting. Under both the model-based and standard approaches, risk weighting is based on an ex ante perspective, considering probabilities of default of loan clients and a given percentile for value at risk. By the time a bank enters resolution, ex ante probabilities have become irrelevant because losses have already been incurred.

[8] See ASC (2012), Hellwig (2014).
[9] Conflicts concerning the allocation of new lending may be more difficult to resolve in a mutually satisfactory manner, however.

3. IS BAIL-IN-ABLE DEBT COSTLY?

3.1 Private costs that are not social costs

The preceding discussion can be summarized in the proposition that the bail-in tool – and perhaps the recovery and resolution procedure altogether – will not work if there is not enough loss absorption capacity. One response might simply be to set very high requirements for equity and bail-in-able debt. This response meets with the objection that loss absorption capacity, equity and bail-in-able debt, are expensive, perhaps even unavailable.

In dealing with this objection, one must distinguish between private and social costs of the different forms of funding. From the perspective of banks, equity and bail-in-able debt are expensive, but many of the costs that banks see are not costs to society. Some may not even be costs to the banks when seen in a proper perspective.

- First, with different classes of debt, some of them protected by government guarantees and some of them not protected, some of them exempt from bail-in and some of them bail-in-able, the debt that is protected by guarantees and/or exempt from bail-in will always be cheaper than the bail-in-able debt. Interest rates on the bail-in-able debt will involve a risk premium so that creditors are compensated for the higher risk they bear. However, the differences in the bank's funding costs that are associated with the different kinds of debt do not represent differences in social costs. If the interest on government-guaranteed debt is lower, the difference reflects the costs of the risk that is borne by the government, and this cost is ultimately borne by taxpayers. If the guarantee comes from a deposit insurance institution, the cost must be borne by this institution and its funders, for example the other banks if the deposit insurance institution is funded by an industry levy. If there is no outright guarantee, but the debt is merely exempt from bail-in and thus senior to the bail-in-able debt, this privilege comes at the expense of the holders of bail-in-able debt whose risks are increased.

- Second, some differences in privately perceived funding costs of different debt instruments (and of equity) may be due to the effects of debt overhang.[10] Once a borrower has outstanding debt, subsequent additional investment and funding decisions affect the risks to which incumbent debt holders are exposed. For example, an additional investment that is funded by junior, bail-in-able debt is likely to lower the risks of incumbent senior debt. The investors who provide the new funding want to be compensated for the risks they run, including the risks that are due to incumbent senior debt holders having priority over them. Since the latter usually cannot be made to pay for the improvement in their positions, the bank and its shareholders may prefer not to get the additional funding and undertake the additional investment even if the investment would otherwise be profitable.

  If the bank has long-term, bail-in-able debt outstanding, however, it may want to undertake new investments and fund them by issuing privileged debt so that the incumbent debt holders are subjected to greater risks. One way to do so would be to issue debt that is exempt from bail-in, e.g. debt that has an initial maturity of less than seven days (and needs to be constantly rolled over). Or it might get funding through a repo agreement, increasing the encumbrance of its assets by collateralization. Even in the absence of such exemptions from bail-in, a shortening of maturities and an encumbrance of assets by collateralization provide means to reduce the costs of later funding by imposing risks on initial (long-term) creditors. From an

[10] Myers (1977), Admati et al. (2015), Brunnermeier and Oehmke (2013).

ex ante perspective of course, the initial creditors will realize that such incentive distortions are present and charge higher interest rates upfront. The inability to commit future funding decisions and the moral hazard attached to these decisions thus end up hurting the bank itself.

These considerations indicate why banks are unlikely to choose socially appropriate levels of funding by equity and bail-in-able debt on their own, i.e. why statutory regulation of these matters is needed. They also explain why industry complaints about the costs of such regulation are not to be taken at face value. Any regulation that is effective is unwelcome to the regulated but that fact by itself is irrelevant if the regulation is needed to make the regulated take account of costs of their actions for the rest of society.

3.2 Genuine social costs and the desirability of differentiating between institutions

From a social perspective, the proper question to ask is whether regulation of bank funding by bail-in-able debt prevents the banks from performing the functions by which they benefit the economy. This is not a question about the availability of lending to small and medium enterprises (SMEs) at low rates. Lending to all enterprises should be undertaken at appropriate rates if the credit risks are acceptable. Bank loan rates that reflect a cheapness of bank funding that is based on anticipations of a bailout by the government, the central bank, the deposit insurance fund or any other institution are in fact inappropriately low because they do not reflect the full social cost of the loan. As mentioned above, if governments want to promote SME lending, it would be more appropriate to do so directly and in a focused manner, rather than by a wholesale subsidization of bank funding.

Banks traditionally benefit the economy by providing investors with liquid assets that they can use whenever they want (liquidity transformation) and by selecting the borrowers to whom they provide funds, assessing their creditworthiness and monitoring their performance. Traditionally, with many institutions, this form of financial intermediation involved the use of liquid deposits to fund illiquid loans. For banks that are mainly active at the retail level, funding by deposits and investing in loans is still the predominant pattern.

For such banks, funding by long-term bail-in-able debt represents a significant change. The change would reduce the extent of maturity transformation. By itself that might be a good thing because the social benefits of *maturity* transformation are not so clear; what matters is *liquidity* transformation, which can also be provided by tradeable debt with longer maturities, e.g. by covered bonds.[11] However, small banks may not have access to bond markets, in which case (i) the bail-in-able debt that they issue might not be liquid and (ii) constraints on their ability to issue such debt might limit their ability to issue deposits and lend.

For large banks, such concerns are hardly relevant. These banks have ready access to organized stock and bond markets. Any limits that MREL requirements might impose on their deposit taking and lending would be due to their unwillingness, rather than their inability to obtain bail-in-able funding. In terms of transition, it would therefore be important to impose such requirement in the form of required values of MREL (as defined by current assets), rather than ratios of MREL relative to assets.[12]

The difference between large and small banks, in the discussion of the preceding section as well as here, suggests that some differentiation between institutions may be warranted. This consideration speaks for the Pillar II approach to MREL that was taken in the BRRD as it currently stands. A Pillar II approach would allow the authorities to take account of the fact that different types of institutions

[11] On the difference between liquidity transformation and maturity transformation and the undesirability of the bank's assumption of interest rate risk from maturity transformation, see Hellwig (1994).

[12] On incentive distortions in transition, see Admati et al. (2015), on the implications for regulation, Admati and Hellwig (2013), Ch. 11.

involve different degrees of systemic risk, hence different degrees of urgency to avoid frictions in resolution, and also different abilities to issue bail-in-able debt without impairing their basic functions.

The seeming conflict between the BRRD's Pillar II approach to MREL and the Financial Stability Board's Pillar I approach to imposing uniform minimum requirements for total loss absorbing capacity (TLAC) of globally systemically important institutions might perhaps be resolved by putting minimal Pillar I requirements for these specified institutions into the Regulation without changing the overall institution-oriented approach of the Directive.

Such Pillar I requirements should not however be limited to those institutions that have been designated as being globally systemically important. At the very least, other systemically important institutions should also be covered. In many markets, these institutions are in competition with globally systemically important institutions. Moreover, these institutions also have access to bond market funding so there is no concern that their having to issue long-term, bail-in-able debt would reduce liquidity transformation. The criterion for discrimination between institutions that is developed here focuses on differences in market access and differences in the ability to provide liquidity transformation, not merely on differences in the degree of systemic importance.

4. RISK WEIGHTED VERSUS TOTAL ASSETS

4.1 General considerations

The BRRD defines MREL in relation to total assets, the Financial Stability Board defines required TLAC in relation to both, risk-weighted and total assets, whichever is more stringent, the European Banking Authority is implementing the BRRD in terms of risk-weighted assets. The European Parliament is considering whether to change the BRRD so as to relate MREL to risk-weighted assets.

I consider such a move to be problematic. I can see the argument for relating the requirement to both, risk-weighted and total assets, whichever is more stringent. However, it is important to see that the risk weighting that is used to compute equity requirements may not be appropriate for computing required funding by bail-in-able debt. Equity and bail-in-able debt serve different purposes. One concerns the bank's ability to absorb losses on a going-concern basis, the other the bank's ability to absorb losses and to mobilize new loss-absorbing capacity in resolution.

Before I turn to the discussion of risk weights in the context of MREL, I want to make some general remarks about risk weighting. The standard argument in favour of risk weighting is the need to avoid banks taking additional risks without having more equity. "Surely a bank that takes large risks ought to be forced to fund with greater equity." This claim seems plausible but the effect of risk weighting in practice is to allow banks that claim to be taking smaller risks to get away with less equity funding. The effects are particularly pronounced with large banks that use their own risk models.

Following the introduction of the model-based approach for market risks in the 1996 amendment to the Basel Accord, large banks have significantly expanded their trading operations, using the model-based approach to greatly reduce the equity allocated to their trading books. With many banks, equity allocated to the trading book fell to less than 1% of assets in the trading book. The insufficiency of equity allocated to assets in the trading book was a major factor in the crisis of 2007/08. Many banks got into difficulties from risks to which they had actually assigned zero weight.[13]

Risk weighting may seem attractive because it is so sophisticated. It is important to realize, however, that the assessment of risks is more a matter of judgment than a matter of measurement and that purported risk measurements are easily manipulated, consciously or unconsciously.

Considering the matter from the perspective of science, it is noteworthy that the data are usually not sufficient to provide reliable estimates: The time series are short and the data generating processes nonstationary. Correlations, which are key to assessing the bank's overall portfolio risk, are notoriously difficult to estimate; moreover some correlations, e.g. the correlations between the counterparty credit risk in a hedge contract and the underlying risk against which the hedge contract should ensure, are changing all the time. The first bank to buy a credit default swap on mortgage-backed securities from AIG faced hardly any counterparty risk. But by the time AIG had sold credit default swaps for $ 500 billion, the counterparty risk in any one of these contracts was large because the credit risks of the mortgages and of the mortgage-backed securities were highly correlated as these risks depended on common factors such as the development of housing prices and interest rates in the United States.

On the side of banks, incentives for proper risk modeling may be lacking, to put the problem diplomatically. The 2008 UBS Report to Shareholders on UBS's Write-Downs documents flaws in risk modelling that were closely related to the incentives of UBS Investment Bank to make their activities appear less risky to UBS Senior Management than they actually were. Recent research on

[13] See UBS (2008), FSA (2010). Besides flawed risk modelling, the use of special purpose vehicles (SPVs) to hold risky assets off-balance-sheet without backing them with equity was another major factor.

the effects of allowing the internal-ratings-based approach to assess credit risks under Basel II suggests that, under this approach, assessments of probabilities of default are systematically lower than under the standard approach while actual probabilities of default are systematically higher.[14]

Additional concerns arise from the observation that major risks are not properly taken into account. Examples are interest rate risk in the bank book,[15] risks from correlated exposures in the bank book, and risks from sovereign exposures in the currency of the country. Interest rate risk in the bank book played a major role in the S&L crises of the early and late 1980s in the United States, correlated exposures in the bank book, in particular, correlated exposures from real estate and SME lending, played a major role in the banking crises of the early 1990s, the US subprime crisis, and, more recently, the Irish and Spanish banking crises. Risks from sovereign exposures in the currency of the country stand at the center of the crisis of the euro area.[16] However, interest rate risk in the bank book and risk from correlations in the bank book ("concentration risk") are left to Pillar 2 supervision without any explicit integration into capital regulation. Sovereign exposures that are denominated in the currency of the country have a statutory risk weight of zero.

The quality of risk modeling has been questioned by the Basel Committee on Banking Supervision. Repeated findings that different banks use different methods and different data and compute very different levels of required capital for the same portfolio have led the BCBS to initiate a program of reform intended to ensure the consistency of capital requirements based on risk-weighting.[17] Some of the Basel Committee's proposals aim at improving the methodology, but they cannot solve the underlying problem that the modelling and data foundations for risk weighting are weak. Additional proposals such as fixed floors for risk weights, suggest that the BCBS itself recognizes the fundamental limitations.

Therefore, even if a risk-weighted approach is used it should not be used alone but in combination with an unweighted approach. The Financial Stability Board's approach of requiring banks to meet both requirements therefore seems plausible. Forcing banks to have more funding with bail-in-able debt if their operations are deemed to be very risky makes sense. By contrast, reductions in required equity or bail-in-able debt funding for banks that claim to have few risks in their books can be very dangerous. Whereas it is true that, without risk weights, a bank that gambles gets away with the same equity funding as one that doesn't, it is even more dangerous that with risk weights that can be flawed and close to zero a bank that exploits the flaw can gamble even more. This distortion underlay the runup to the crisis.

At the same time, we must worry about the fact that, under current accounting rules, "total assets" are not actually total assets. Under the rules set by the International Accounting Standards Board, netting for derivatives allows many risks and many positions to not even appear on a bank's balance sheet. For example, the purchase by Deutsche Bank of a put on Italian government bonds from Monte Paschi di Siena in the fall of 2008 was artfully split into three transactions, an outright sale of bonds from Deutsche to Monte Paschi, a repo loan from Monte Paschi to Deutsche using the same bonds as collateral, and an interest rate swap with a termination clause containing the option, so that, under given netting rules, the positions did not appear in the banks' balance sheets. The obligation from the transaction ended up contributing significantly to the difficulties of Monte Paschi in 2012. Similarly, banks' commitments to their own special purpose vehicles off their balance sheets are often not listed in their books.

[14] Behn et al. (2014).
[15] Admati and Hellwig (2013), Ch. 11, BCBS (2016).
[16] This is not just a statement about the Greek debt write-down of 2012. Altavilla et al. (2016) show that, quite generally, the exposure of banks to their holdings of domestic sovereign debt amplifies the transmission of stress in the sovereign debt markets, with reduced bank lending to the real economy and increased lending rates.
[17] See for example BCBS (2015a), EBA (2014).

For the determination of MREL, TLAC or simply required equity, it is important that *all* source of risk are taken into account, including those that do not appear in the bank's balance sheet. For bail-in-able debt, the urgency is all the greater since surprises in resolution can destroy the viability of the resolution process itself.

4.2 Risk weighted assets versus total assets and the capacity for loss absorption in resolution

Whereas in resolution remaining equity absorbs losses like bail-in-able debt and, indeed, ahead of bail-in-able debt, the loss absorption function of bail-in-able debt is not the same as that of equity, and regulation of MREL is conceptually different from capital regulation. Capital requirements, in particular, going concern capital requirements, concern the bank's ability to absorb losses prior to any resolution procedure. Such loss absorption actually forestalls the need for a resolution procedure. By contrast, MREL regulation concerns the absorption of losses in resolution but not before.

Because of this difference, the assertion by EBA (2015) that "regulatory capital requirements and buffers already reflect the judgement of the supervisor and legislators about the level of unexpected losses an institution should be able to absorb" is very problematic.[18] With this assertion, EBA glosses over the fact that loss absorption on a going-concern basis and loss absorption in resolution are different. In fact, different notions of risk are appropriate in considering risk weighting for requirements of funding by equity and by bail-in-able debt.

The difference is understood most clearly if one considers the admittedly absurd situation where the bank holds only a single asset, say a loan. From the ex ante perspective appropriate when considering equity requirements, an assessment of risk turns on the probability of default as well as the potential loss given default. From the ex post or ex interim perspective appropriate for considering the determination of bail-in-able debt that is needed in resolution, an assessment of "risk" will turn on the loss given default because, by the time resolution is initiated, the loan has been defaulted on, i.e. the ex ante probability of default is no longer relevant.

In the real world of course, the bank holds more than one asset and the zero-one treatment of default in the preceding paragraph is inappropriate. Thus, if the bank holds multiple loans, then, by the time the authorities initiate resolution, some will have defaulted and some will still be sound. Nevertheless, the basic point remains valid: By the time resolution is initiated, some adverse information has been realized and the prior probability assessments that were used in assessing equity requirements are no longer appropriate.

This basic point also remains valid if one allows for the possibility that risk assessments are continuously updated so that, shortly before resolution is triggered, risk assessments are no longer the same as ex ante. Even in this case, the mere initiation of the recovery and resolution procedure is likely to necessitate a thorough reassessment of risks in the bank's books. Upon entering the bank, the resolution authority is likely to receive new information about the skeletons in the bank's balance sheet. Market investors may draw information from observing the authority's intervention; the resulting increase in investor apprehensiveness may induce the authority to take a more pessimistic view of the bank's funding and of the need to generate trust in the thoroughness of the asset valuation and bail-in procedure. The somewhat mechanical approach taken by EBA (2015) to the assessment of equity needed to establish investor confidence does not address this requirement.

In terms of the situation when resolution is started, two questions are key: First, what is the fraction of impaired assets and what is the average loss ratio. Second, what is the *conditional* probability of default on other loans and what is the *conditional* value at risk on assets in the trading book given where the bank stands as it enters resolution. The first question is important for determining actual write-downs on assets. The second question is important for determining what risks the bank is still

[18] EBA (2015 a), p. 7.

exposed to. Increases in conditional default probabilities may also require write-downs. Even if they don't, they matter for the capital the bank needs in order to be allowed to maintain its operations.

In terms of the bank book, the questions posed require a look at expected losses given default and a look at the correlations between different default risks. Default correlations have an influence on how many loans might default at the same time; they also affect probabilities of default on unimpaired loans conditional on the event of impairment on those loans that require write-downs. In practice, however, the methods used for assessing loss given default and for dealing with correlations are very crude and have little to do with serious risk analysis.

In terms of the trading book, one needs an assessment of loss expectations conditional on the event that equity is insufficient, as opposed to the assessment that the probability of the latter event lies below a specified threshold. The prevailing value-at-risk approach to assessing capital requirements for market risks focuses on the probability of equity being insufficient and pays little attention to the amount of the shortfall if this event should occur. But the viability of resolution depends on the size of the shortfall relative to the available capacity for loss absorption in this event.

In the context of determining equity requirements, the crudeness may be tolerable. After all, the main concern of regulation to ensure that the probability of equity being insufficient is very low. In the context of determining requirements for bail-in-able funding, however, the crudeness is highly problematic. In this context, it is of the utmost importance that remaining equity and bail-in-able debt be sufficient to cover losses when the bank goes into resolution and that it be sufficient to provide the recapitalization that may be needed to keep the bank going - taking account of the fact that intervening events may have led to a more pessimistic assessment of circumstances and of the risks inherent in the bank's assets.

I doubt that we have the data required to do this analysis with any degree of reliability. Even if we did, the determination of appropriate risk weights for the determination of bail-in-able debt would require a new framework that has room for questions that Basel II and III have not considered. For example, one might want to consider a scheme for determining "resolution at risk", i.e. set a threshold for the probability that equity plus bail-in-able debt together might not be able to absorb losses. Or one might consider the tradeoff between the threshold probability for "resolution at risk" and a measure of the social damage if resolution fails. At this point, systemic notions of damage must be taken into account, namely the costs to the financial system and the overall economy if resolution fails for a lack of bail-in-able funding.

Conceptually, setting a threshold for "resolution at risk" might not seem very different from setting a threshold for value at risk, e.g. the 1% considered for market risk. For example, we might want to impose a threshold such that, if the bank enters resolution, then with a probability of 99 %, the available loss absorption capacity is sufficient to cover immediate write-downs and provide sufficient equity for maintaining systemically important activities. From an ex ante point of view, this would correspond to making insufficiency if loss absorption capacity in resolution an event that occurs with a probability no greater than one hundredth of one percent (one percent conditional on the one-percent event that resolution is needed).

Such a framework can be set up, but we should have no illusion that estimates of probabilities of such tail events can be done with any acceptable degree of reliability. Within the given models, under the given distributional assumptions, one can compute the numbers, but the relevance of the numbers depends on the distributional assumptions and, even more critically, on the specification of the models. Given these concerns, I strongly advise against any form of exclusive reliance on the risk weighting approach for the determination of requirements for bail-in-able debt.

Given that "total assets" are not actually total assets, as discussed above, the FSB's proposal to rely on both, risk-weighted and total assets and go by whichever requirement is more stringent seems most reasonable. By contrast, an approach that focuses only on risk-weighted assets involves a significant danger of missing the main objective of having sufficient loss absorption capacity in resolution.

The reference to total assets is also important in the context of the actual write-downs or conversions of bail-in-able liabilities. Write-downs and conversions are mandated as a result of revaluations of assets in bank balance sheets. Even if one has doubts about the substance of balance sheet entries (which presumably can be settled once the final accounting is made), it these balance sheet entries have a legal dimension which provides some protection against legal objections from the creditors in question. A threshold like the 8% of total assets for which remaining equity and bail-in-able liabilities must be bailed in before a resolution financing arrangement can be tapped has the advantage that it is defined in terms of the very balance sheet entries that are relevant in the bail-in procedure itself. If such a threshold was defined in terms of risk-weighted assets, the implications in resolution might be less straightforward and might give rise to disputes that might hamper the resolution itself.

5. DOES IT MATTER? THE POTENTIAL IMPACT OF BASING MREL ON RISK-WEIGHTED VERSUS TOTAL ASSETS

5.1 Distribution effects across banks

The Basel Committee's and EBA's impact assessments for TLAC and MREL have focused on large banks.[19] For TLAC, this was natural given that the FSB's TLAC proposals concern globally systemically important institutions. For MREL, the focus on large banks seems to have been due to data limitations.

In the context of the question faced by the European Parliament, whether to base the MREL requirement on risk-weighted or on total assets, data limitations are a serious problem. The impact of the choice is likely to be different for different classes of banks. In risk weighting, large banks tend to have an advantage because they have the resources required to use the model-based approach to market risks and the IRB approach to credit risks. In contrast, small banks are more likely to use the standard approach in both areas. However, I have not been able to obtain disaggregated data referring to small banks.

For globally systemically important institutions, the choice concerning MREL will not make much of a difference if the FSB's proposals for TLAC are implemented through a Pillar 1 rule that provides for both, a minimum TLAC requirement of 16 – 18 % of risk-weighted assets and a minimum TLA requirement of 6.75 % of total assets. The question then is where the boundary is drawn between institutions that must satisfy these Pillar 1 requirements and institutions that only need to satisfy a Pillar 2 MREL requirement. As mentioned above, it would be appropriate to have the same requirement for these institutions as well as the globally systemically important institutions.

For small institutions, the available data do not permit any quantitative assessment. However, it seems clear that the choice between risk-weighted and total assets for MREL is likely to matter most for those institutions that have large portfolios of assets that are privileged in the regulation, namely public debt and real estate loans (mortgages). For a bank that invests entirely in these assets, the average risk weight may be on the order of 20% or less, in which case the FSB's 18 % of risk-weighted assets amounts to only 3.6% of total assets, barely above the Basel III leverage ratio, Under the approach taken by EBA (2015), the number would be even smaller, 2.1% of total assets.[20]

With small institutions that are not systemically important, one may question whether the bail-in tool is needed. If the institution is not systemically important, it can presumably be wound down without any fear of systemic damage, in which case insolvency law will be applied. However, if many small institutions are involved, as was the case with the savings and loans institutions in the US in the 1980s and with the Cajas in Spain in the recent crisis, they may end up being systemic after all. Merging several institutions into one may be one way to move forward, at which point there is a need for loss absorption outside of insolvency law. It should be noted that such an occurrence is most likely when many institutions have engaged in similar risks, e.g. in real-estate lending, the very kind of activity that is privileged by risk-weighting.

[19] BCBS (2015b), EBA (2015).

[20] EBA (2015), pp. 8f; EBA presumes a total capital requirement plus combined buffers equal to 10.5% of risk-weighted assets but then assumes a ratio of risk-weighted to total assets equal to 35%, so the MREL ends up at 3.75 % of total assets. For a bank specializing in public debt and mortgages, 35% would be quite high.

5.2 Distribution effects across countries

The distribution of the different effects across countries depends on the distribution of the different types of banks and on the distribution of the different types of activities across the different countries.

Within the euro area, globally systemically important institutions are not uniformly spread across countries. In addition to the globally systemically important financial institutions in larger countries (7 in Germany, 5 in France, 4 in Spain, 3 in Italy), there are 3 such institutions in the Netherlands and one each in Belgium and Austria.

By contrast, the other systemically important financial institutions are more evenly spread across the euro area. This more even spread reflects the fact that the definition of other systemically important financial institutions takes account of the importance of an institution within a country. However, there are significant differences in size. The largest bank in a small country might not even be among the ten largest banks in a large country. If such a bank was located in the larger country, its impact on the system would be small and at least outside an overall crisis it might not be difficult to find a buyer for it. Given that it is located in a country where it is systemically important resolution may be more difficult however especially if concerns about the country's finances and the country's financial system make it difficult to find a buyer from across the border.

The size distribution of banks varies a lot across countries. In some countries, a small number of banks dominates the financial system and holds a large fraction of assets; examples are Greece (6 banks hold 92% of total bank assets), the Netherlands (10 banks hold 87% of total bank assets), Estonia (5 banks hold 87% of total bank assets), and Finland (5 banks hold 85 % of total bank assets).[21] In these countries, the impact of legislative change concerning TLAC and MREL depends on whether nationally systemically important financial institutions are treated like globally systemically important financial institutions, i.e., whether they must satisfy TLAC requirements or not. If these institutions must satisfy a Pillar 1 TLAC requirement that conforms to the FSB standards, then the impact of a change in MREL on these countries will be small.

In other countries, the size distribution of banks is more dispersed. The most extreme cases are Malta (4 banks hold 30% of total bank assets) and Luxembourg (10 banks hold 34 % of total bank assets), where the numbers reflect, at least partly, the presence of foreign banks. Of greater interest in the present context are countries like Austria (9 banks hold 40 % of total bank assets) or Germany (60 banks hold 64 percent of total bank assets), where there are strong traditions of public or cooperative banking with a high degree of institutional decentralization.[22] For institutions of this type, which are unlikely to be assessed as being systemically important in any sense, at least on an individual basis, a Pillar 2 requirement for MREL is likely to be of particular importance. Unfortunately, I have not seen any data about these institutions that would permit a serious quantitative assessment.

Looking at the problem from another perspective, I have considered the roles of real estate and sovereign lending in different countries. Since real estate and sovereign lending enjoy low risk weights, the impact of risk weighting is likely to be largest where these positions are most important. For real estate lending, EBA (2016) show a share of real estate activities in total exposures exceeding 30% in Germany, Finland, Ireland, a share between 20% and 30% in Austria, Spain, France, the Netherlands, and a share below 20% in Belgium, Estonia, Cyprus, Croatia, Italy, Luxembourg and Portugal.
Turning to the distribution of sovereign exposures in the euro area, Table 1 below, which is drawn from the ECB's Statistical Data Warehouse, gives an overview over the absolute values and the share in total assets of sovereign exposures of banks in the different euro area countries at the end of the first quarter of 2016. The numbers must be considered with some caution because, as explained by

[21] See Altavilla et al. (2016).
[22] See Altavilla et al. (2016).

Altavilla et al. (2016), there is significant dispersion with countries as well as between countries. However, I have not had access to the individual bank data used by Altavilla et al. (2016).

The average of sovereign exposures of monetary financial institutions in the euro area amounts to 9,4 % of their total assets. However, there is significant dispersion. In some countries, sovereign exposures of banks lie significantly above the average. Sovereign exposures relative to total assets lie above 15 % in Italy, Slovenia, and Slovakia. Italy in fact exhibits the largest absolute amount, slightly larger than in Germany, where total assets are almost twice as large. Sovereign exposures lie below 7% in Estonia, Greece, France, Cyprus, Latvia, Luxembourg, Malta, Netherlands, and Finland.

The differences between countries reflect differences in traditions as well as differences in crisis experiences. For example, the difference between France and Germany most likely reflects the fact that in France, government debt is more prominently held by insurance companies than by banks whereas in Germany, government funding has traditionally been a major function of regional and local public banks. In Italy as well government funding has traditionally been a major function of banks, but in this case, significant public deficits in the crisis of the past few years have significantly increased this role.[23] Altavilla et al. (2016) note that, since 2011, sovereign exposures of banks in "vulnerable countries" (Cyprus, Greece, Ireland, Italy, Portugal, Slovenia, Spain) have grown significantly faster than in "non-vulnerable" countries.[24] They also observe that this growth was much particularly in public banks, in banks that had recently been bailed out, and in banks that were poorly capitalized and interpret this finding by a combination of "moral suasion", applicable in public banks and banks that had recently been bailed out, and a "carry trade", i.e. risk-taking, applicable in poorly capitalized banks that were gambling for survival. Whereas Altavilla et al. (2016) treat "vulnerable" countries as a group, it is worth noting that by now these countries' banks sovereign exposures are quite heterogeneous.

To translate these numbers into MREL requirements, is suffices to note that, under a risk-weighted-assets approach, holdings of central government debt that is denominated in the currency of the country would not entail any MREL requirements and, under a total-assets approach, using the 8% ratio given in Art. 44 of the BRRD, holdings of government debt equal to 10% of total assets would add some 0.8% of total asset to the requirement for bail-in-able liabilities, 0.5% more than the Basel III leverage ratio requirement. The last column of Table 1 lists the impact 8% addition for the different countries relative to total assets. The overall effects seem relatively small except for Spain, Italy, Slovenia and Slovakia; for Spain and Italy of course the indicated percentages are applied to relatively large values of total assets.

These numbers should *not* be interpreted as definitive measures of the impact of using total rather than risk-weighted assets for MREL. The actual impact is likely to be smaller for several reasons. First, as mentioned, for banks subject to TLAC requirements the issue is moot, and presumably there is no additional effect of the treatment of MREL. Second, since Basel III stipulates a leverage ratio requirement of 3% anyway, the 8% MREL requirement assumed in Table 1 is not fully an addition. Third, depending on the treatment of debt issued by subunits of governments, some of the sovereign exposures may already have positive risk weights.

[23] See ESRB (2015), Altavilla et al. (2016).

[24] „Vulnerability" is defined by the event that the premium of sovereign debt relative to the German Bund has exceeded 6 % in at least one quarter during the period under consideration.

Table 1: Sovereign Exposures of Euro Area Banks

	Government loans and securities		MREL addition
Country	**€ billion**	**% of total assets**	**% of total assets**
Belgium	117,4	10,5	0,84
Germany	720,4	9,3	0,74
Estonia	0,7	3	0,24
Ireland	75,3	7,2	0,58
Greece	22,2	5,8	0,46
Spain	385,5	13,7	1,1
France	482,8	5,8	0,46
Italy	728,8	18,4	1,47
Cyprus	3,9	4,5	0,36
Latvia	1,4	4,5	0,36
Lithuania	2,2	8,9	0,71
Luxembourg	63	6,3	0,5
Malta	3,2	6,8	0,54
Netherlands	159,1	6,1	0,49
Austria	80,6	9,4	0,75
Portugal	52,1	11,7	0,94
Slovenia	9,1	22,4	1,79
Slovakia	11,8	16,8	1,34
Finland	30,5	5,1	0,41
Euro area	2950,3	9,4	0,75

Source: ECB Statistical Data Warehouse, own calculations.

According to the Capital Requirements Regulation, the zero-risk-weight rule applies to debt issued by central governments or to debt issued by subunits of governments if this debt is guaranteed by the central governments. In this respect, the legal situation is unclear. Quite often, regions and municipalities are assumed to be guaranteed by central governments but the case of the province of Carinthia and the treatment by the government of Austria of the guarantees that Carinthia had given to the bank Hypo Group Alpe Adria suggests that in practice these guarantees are not always tight. This question might arise, for example, for public savings banks and Landesbanken in Germany, which hold debt of the municipalities and the Länder, where it is not clear to what extent this debt is covered by the Federal Government.

In the back of these observations stands the question of principle whether the zero-risk-weight rule for sovereign exposures is appropriate in a context where sovereign debt is not actually riskless. The issue has been extensively discussed by the European Systemic Risk Board.[25] If risks are actually present, it seems appropriate for banks to protect against them. The concern that governments under stress do not want to see the stress increased by having banks shy away from funding them is understandable but raises serious issues about the relation between banks and their sovereigns. The more one gives way to these concerns, the more difficult it will be to cut the bank-sovereign nexus, one of the objectives of the European banking union.

In this context, it worth pointing out that the benefits to stressed governments from having access to easy bank finance come at a cost. Altavilla et al. (2016) given evidence showing that the funding of stressed governments in the crisis has come at a significant cost in terms of reduced lending and higher loan rates to nonfinancial companies, in particular SMEs. The privilege accorded to sovereign borrowing provides the basis for a form of financial repression that is inimical to economic growth.

[25] See ESRB (2015).

6. CONCLUSIONS

For the viability of the resolution tool it is of the utmost importance that remaining equity and eligible liabilities be sufficient to cover losses assessed in resolution so as to re-establish solvency. If there is any doubt about solvency in resolution, continued funding is at risk, and that could make it impossible to maintain systemically important operations, even temporarily.

Most of the costs of MREL and TLAC that are perceived by the institutions themselves are not truly social costs but are private costs that are matched by benefits to taxpayers not to mention the benefits from reducing systemic damage.

However, it may make sense to have a differential treatment of small institutions that do not have access to organized markets and of large institutions that do have access and that are more likely to raise systemic concerns in resolution.

Calibrating regulatory requirements to risk-weighted assets is problematic because risk weights are highly unreliable; the statistical basis for determining risk weights is insufficient and the procedure lends itself to manipulation, including manipulation by subunits of the regulated unites. Important risks are not even consistently covered.

For MREL and TLAC, risk weighting is particularly problematic because the relevant risk is not defined in terms of the probability of something bad happening but in terms of the extent if the damage if something bad happens. Reliable estimates for conditional expectations and conditional correlations are even more difficult to obtain than reliable estimates for value at risk and probabilities of default.

Calibrating regulatory requirements to total assets suffers from the fact that "total assets" do not really represent total assets. Due to netting and other accounting provisions, important risks do not appear in balance sheets.

Given the flaws in both approaches, the Financial Stability Board's proposal to impose lower bounds on total loss absorption capacity in resolution in terms of both, risk-weighted and total assets may at this point be the most reasonable way forward.

Whereas a lack of data prohibits a reliable quantitative assessment, proxy considerations relying on real estate exposures and sovereign exposures suggest that in terms of additional funding by bail-in-able debt, the overall effect is likely to be small, but for some countries, the need to have MREL backing sovereign exposures may be significant.

REFERENCES

- Admati, A.R., and M. Hellwig (2013), The Bankers' New Clothes, Princeton University Press, Princeton, N.J.Ch. 11

- Admati, A.R., P.M. DeMarzo, M.F. Hellwig, and P.C. Pfleiderer (2015), The Leverage Ratchet Effect, Max Planck Institute for Research on Collective Goods, Preprint 2013/13 (revised 2015) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2304969.

- Altavilla, C., M. Pagano, and S. Simonelli (2016), Bank Exposures and Sovereign Stress Transmission, Center for Studies in Economics and Finance, Department of Economics, University of Naples, Working Paper No. 410, April 2016, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2640131

- ASC (2012), Forbearance, resolution, and deposit insurance, Report 01/2012 of the Advisory Scientific Committee of the European Systemic Risk Board, https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_1_1207.pdf?c4a55781325f99ef619100f7d239321a

- ASC (2014), Is Europe Over-Banked, Report 04/2014 of the Advisory Scientific Committee of the European Systemic Risk Board, https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_4_1406.pdf?5fb1382c5a560f243ecf1989cfd37f4c

- BCBS (2015a), Regulatory Consistency Assessment Programme: Report on risk-weighted assets for counterparty credit risks, Basel Committee on Banking Supervision, October 2015.

- BCBS (2015b), TLAC Quantitative Impact Study, Basel Committee on Banking Supervision, November 2015.

- BCBS (2016), Standards: Interest Rate Risk in the Banking Book, Basel Committee on Banking Supervision, April 2016.

- Behn, M., R. Haselmann, and V. Vig, (2014), The Limits of Model-Based Regulation, SAFE Working Paper No. 75, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2523383

- Brunnermeier, M., and M. Oehmke (2013), The Maturity Rat Race, *Journal of Finance* 68, 483 – 521.

- EBA (2014), EBA Report on Counterparty Credit Risk Benchmarking.

- EBA (2015 a), EBA Final Draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU

- EBA (2015 b), Risk Assessment of the European Banking System, December 2015, http://www.eba.europa.eu/documents/10180/1315397/EBA+RISK+ASSESSMENT+REPORT.pdf/46d91b9a-f393-4b54-96eb-df06ca01bec5

- ESRB (2015), ESRB Report on the regulatory treatment of sovereign exposures, March 2015, http://www.esrb.europa.eu/pub/pdf/other/esrbreportregulatorytreatmentsovereignexposures032015.en.pdf?c0cad80cf39a74e20d9d5947c7390df1

- FSA (2010), The prudential regime for trading activities, Discussion Paper 10/4, Financial Services Authority, London.

- Hellwig, M.F. (1994), Liquidity Provision, Banking, and the Allocation of Interest Rate Risk, European Economic Review 38, 1363 – 1389.

- Hellwig, M.F. (2012), The Problem of Bank Resolution is Unsolved: A Critique of the German Bank Restructuring Law, in: P. Kenadjian (ed.) *Too big to fail*: Brauchen wire in Sonderinsolvenzrecht für Banken?, De Gruyter, Boston, 35 – 62.

- Hellwig, M.F. (2014), Yes, Virginia, There is a European Banking Union! But it May Not Make Your Wishes Come True, Max Planck Institute for Research on Collective Goods, Bonn, Preprint 12/2014, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2487757

- Liikanen Report (2012), Final Report of the High-level Expert Group on reforming the structure of the EU banking sector Chaired by Erkki Liikanen, http://ec.europa.eu/internal_market/bank/docs/high-level_expert_group/report_en.pdf

- Myers, S.C. (1977), Determinants of Corporate Borrowing, Journal of Financial Economics 5, 147 – 175.

- UBS (2008), Shareholder Report on UBS's Write-Downs, Zürich, April 18, 2008.

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