EUROPEAN ECONOMY
BANKS, REGULATION, AND THE REAL SECTOR

CAPITAL REQUIREMENTS FOR LARGE BANKS

FROM THE EDITORIAL DESK

The tangled web: do capital requirements and loss absorption capacity foster a systemic risk free, pro-growth banking environment? by Giorgio Barba Navaretti, Giacomo Calzolari and Alberto Franco Pozzolo

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Capital Requirements and Loss Absorption Capacity for Large Banks

What is European Economy

European Economy – Banks, Regulation, and the Real Sector (www.european-economy.eu) is a new on line journal to encourage an informed and fair debate among academics, institutional representatives, and bankers on the regulatory framework and its effects on banking activity and the real economy. It is an independent journal, sponsored by Unicredit Group.

The journal aims at becoming an outlet for research and policy based pieces, combining the perspective of academia, policy making and operations. Special attention will be devoted to the link between financial markets and the real economy and how this is affected by regulatory measures. Each issue concentrates on a current theme, giving an appraisal of policy and regulatory measures in Europe and worldwide. Analysis at the forefront of the academic and institutional debate will be presented in a language accessible also to readers outside the academic world, such as government officials, practitioners and policy-makers.

This issue: *Capital Requirements and Loss Absorbing Capacity for Large Banks.* How effective can capital requirements and loss absorption requirements be in reducing systemic risk? What is their impact on lending to the real economy? Is the bail-in principle effective in enhancing the resilience of banks and reducing the occurrence of bail-outs with tax payers funds?

The debate on capital requirements for large banks is nested around the trade-off between hedging systemic risk and expanding lending to the real economy and fostering economic growth. This first issue is devoted to disentangling this debate and discussing its key ingredients.

Its bottom-line is that all capital requirements and loss absorption measures are necessary but also imperfect tools for achieving financial stability, and under several circumstances they may hinder growth. The specific provisions and the design of these measures must be assessed and understood with care and balance. Especially crucial is the discussion on Total Loss Absorption Capacity (TLAC), given that its regulatory framework is still under definition and that this measure is sizeable and expected to have a major impact on the structure of banks' liabilities.

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From the Editorial Desk

The tangled web: do capital requirements and loss absorption capacity foster a systemic risk free, pro-growth banking environment?

by Giorgio Barba Navaretti[1], Giacomo Calzolari[2] and Alberto Franco Pozzolo[3]

The debate on capital requirements for large banks is nested around the presumed trade-off between hedging systemic risk on the one side and expanding lending to the real economy and fostering economic growth on the other. This first issue of *European Economy - Banks, Regulation and the Real sector*, is devoted to disentangling this debate and discussing its key ingredients.

All regulatory changes following the financial crisis of 2007 have been aimed at strengthening banks' balance sheets, to a large extent by reducing leverage and increasing capital buffers. As we show in the 'Numbers' section of this issue, on average Tier 1 capital ratios on risk weighted assets (RWA) have increased from approximately 8% to above 12% and leverage (measured as total assets on equity) has gone down from 21 to 17 for the four large Euro countries between 2008 and 2014.

On top of these requirements, regulators are identifying classes of liabilities that can be explicitly targeted in terms of their loss absorbing capacity to bail-in banks in distress, like the minimum requirement for own funds and eligible liabilities for bail-in (MREL) identified by the European Bank Restructuring and Resolution Directive (BRRD). The bail-in principle implies that shareholders and some classes of creditors will take the bill in the occurrence of a bank's restructuring or resolution, instead of being bailed-out by other sources of funds.

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3. University of Molise

Extra requirements have been imposed on Globally Systemically Important Banks (G-SIBs), justified by the systemic dimension of their activities and by the moral hazard concern implicit in the 'too big to fail' (TBTF) argument: the presumption that tax payers' funds would always be at hand to bail out systemically relevant financial institutions. In the period 2008-2012, the overall volume of State aid used for capital support measures alone amounted to €591.9, equivalent to 4,6% of EU 2012 GDP (European Commission, Economic Review of the Financial Regulation Agenda, 2014). As for loss absorbing capacity, the Financial Stability Board is issuing a specific regulation (still under definition as we write) requiring systemic banks to hold extra layers of bail-in-able liabilities, the so called Total Loss Absorbing Capacity (TLAC).

How effective can additional capital requirements be in reducing systemic risk? What is their impact on lending to the real economy and on economic growth? Is the bail-in principle effective in enhancing the resilience of banks and reducing the occurrence of bail-outs with tax payers funds? Is there a discontinuity between equity capital and other loss absorption liabilities? Are these measures neutral to different banking business model? Are there alternative measures to achieve the same outcome? Is a differential treatment for large and small banks justified?

These are some of the key questions addressed in this issue. The bottom-line is that the answers are not straightforward: all capital requirements and loss absorption measures are necessary but also imperfect tools for achieving financial stability, and under several circumstances they may indeed hinder growth. For this reason, the specific provisions and the design of these measures must be assessed and understood with care and balance. Especially crucial is the discussion on TLAC, given that its regulatory framework is still under definition and that this measure is sizeable and expected to have a major impact on the structure of banks' liabilities (according to its Consultative Document of November 2014 the FSB envisages a common Pillar 1 Minimum TLAC requirement between 16% and 20% of risk weighted assets, more than double than the Basel III minimum total capital requirements, and rising to up to 19.5% to 25% of RWAs if other regulatory capital buffers are included).

This bottom-line conclusion reflects the common thread across the contributions to this issue, even though with a differentiated degree of support for capital requirements and loss absorption measures: three leading articles

by very distinguished and influential academics: Jean Charles Rochet (University of Zurich), Thorsten Beck (Cass Business School - City University of London) and Jan-Pieter Krahnen (Goethe-University Frankfurt) and the notes in the (Q&A) section by three key institutional figures with leading roles in the implementation of the new regulatory framework (Andrew Gracie, Executive Director, Resolution Bank of England; Laurent Clerc, Director Financial Stability Banque de France; and Carmelo Salleo, Head of Macro-Financial Policies Division, European Central Bank) and a representative of the industry, Santiago Fernandez de Lis, Chief Economist for Financial Systems and Regulation at BBVA.

We believe that this first issue of our journal provides a balanced discussion of capital requirement and loss absorption measures for large banks and in general, and it will help the policy debate focussing on the most critical questions. This editorial summarises some key findings and discusses the most controversial issues emerged. Given its relevance, a specific section is devoted to the TLAC issue. The editorial is also followed by three sections reporting the key numbers, the key institutional and regulatory measures and the key readings concerning this issue, prepared by the Junior Editor of the journal, Maria Teresa Trentinaglia.

1. The trade-off: reducing systemic risk vs. financing the real economy

The aim of equity capital requirements and of the other bail-in-able liabilities is essentially to create buffers capable to absorb losses and increase the resilience of banks during distress (Gracie and Clerc in this issue). To a large extent, the banking industry and other commentators have challenged capital increases on the ground that these would have forced banks to reduce lending and total assets so as to meet regulatory capital ratios. Indeed, lending to non-financial enterprises and banking assets shrank along with capital increases since 2011 (see the Numbers section**)**. But the jury is still out on how far the former is a consequence of the latter. As discussed explicitly in the first leading article of this issue by Jean Charles Rochet, we do not yet have adequate theoretical models and structural empirical estimations able to address this issue in an adequate way. Also, trends in assets and lending are very divergent

across European countries and for most of them levels are still higher than at the beginning of 2006 in nominal terms (see the Numbers section).

The extent and the nature of this trade-off has been hotly debated. Its mere existence has been put into question by some; others, at the opposite side of the spectrum, have taken the negative impact of capital requirements on lending for granted. We believe that the nature and the extent of this trade off rest on a large number of details: timing of implementation, size of capital requirements, risk weighting provisions, definition of eligible capital instruments, market frictions, etc. Moreover, given that requirements are the outcome of several layers of frequently overlapping and sometimes inconsistent regulations, the web is pretty tangled.

Is capital neutral? The Modigliani Miller debate

In principle, risk declines with lower leverage, because of the loss absorption function of equity capital (and to some extent of other bail-in-able liabilities). If there were no frictions, markets should be able to factor in the reduction in risk and shareholders accept a lower return on equity. Consequently, advocates of the approach based on the Modigliani Miller theorem (one of the most frequently quoted examples is the influential book published in 2013 by Admati and Hellwig "The Bankers' New Clothes: What's Wrong with Banking and What to Do about It") argue that bankers should have no problem in meeting more stringent regulatory requirements, and that their claim of the contrary (i.e. that they are unable to raise capital because of insufficient returns and therefore they are forced to meet requirements by shrinking their assets and lending) is misplaced. This argument has been very influential also at the policy level and is reflected in several official documents and position papers (see for example the literature cited in the Key readings section and by Beck, in this issue).

Although the neutral impact of increased capital requirements might hold in the longer term, several contributors to this issue argue that the impact on lending might be severe in the short term because of market frictions (e.g., Rochet and Beck in this issue). Also, several contributions, based on dynamic general equilibrium models, find an inverted U shape relationship between bank lending and capital requirements and estimate that the optimal level of regulatory capital should be in the range of 8 to 14%: capital requirements

above these values may have an inhibiting effect on the real economy activity (see Clerc in this issue).

The evidence shows that even though capital increases have been sizeable, banks have met the new capital requirements also partly by reducing their assets and rebalancing their portfolio towards asset classes with a lower risk weight, particularly in the aftermath of the sovereign crisis (see the ECB Financial Stability Review of November 2014 and the Numbers section in this issue).

This evidence does not say much on the relationship between capital requirements and lending. Banks have restructured their balance sheets also for reasons strictly inherent to market conditions, rather than just because of regulatory requirements. Yet it is certainly true that the rise of risk aversion, the large uncertainty in banks' fate and the dramatic increase in non-performing loans and in the consequent capital absorption have made raising fresh capital rather difficult and expensive during the downturn.

As we report in the Numbers section, the Average return on Equity has gone down from over 10% to below 5% for banks in the large Euro area countries between 2007 and 2014 and even to lower values for some among them. At the same time, according to the ECB Financial Stability Review of 2015, the estimated cost of bank equity has been in the 8% to 10% range for most banking institutions in the Euro area throughout the crisis and diverging since 2011 between Northern and Southern European countries, mostly driven by bank equity risk premium.

Capital requirements and asset allocation

Another crucial issue affecting the trade-off between safety and lending is how capital requirements impact on asset allocation. Two opposite scenarios are possible here. In principle, banks could pursue a low risk strategy to minimize the capital absorption of their assets, as some large banking groups did during the crisis, particularly after 2011 in the EU. This indeed implies avoiding risky loans to the private sector, especially to SMEs, and investing in safer assets, such as loans to large corporations or sovereign securities.

However, an opposite move is also conceivable as a consequence of increased requirements. A key function of banks is of course transforming illiquid risky assets into liquid and safe liabilities (see Salleo in this issue). Regulators

should not aim at sterilizing banks from market risks, as failure is part of the market process and a potentially effective disciplinary device (as argued by the contributions of Krahnen, Beck and Gracie in this issue). The inherent riskiness of banking implies that however well capitalised are balance sheets, there is a floor in the level of the returns on equity that shareholders would accept to fund risky assets like loans to the private sector. Indeed, equity per se is neither safe nor especially liquid, given its junior status in the hierarchy of banks liabilities (see above on the estimates of the cost of equity for EC banks). As a consequence, increased capital requirements might induce banks to invest in riskier assets, with higher expected returns but also more severe tail risks.

This could expose banks to higher risks. In addition, from a systemic point of view, there is the further issue that more risky activities could end up being carried out through non regulated shadow vehicles. The threats to the stability of the financial system of a move in this direction are difficult to evaluate, but cannot and should not be underestimated.

An important factor here is the accuracy of risk weighting rules in assessing the real risk of asset allocation. If risk weighting rules work adequately, risk taking should be fully reflected in capital requirements. If risk weighting is not accurate enough, banks might end up with risky asset allocations not matched by an adequate capitalization. As argued by Beck in this issue, pre-crisis risk weighting failed to predict clearly the riskiness of asset allocation and the health condition of banks' balance sheets. Precisely because of the difficulty in identifying fully accurate metrics for risk weighting, the Basel III framework, and also the provisions for TLAC, impose target leverage ratios.

Incentives: the ex-ante tackling of systemic risk

The aim of the regulatory frameworks we are considering is to set incentives to mitigate excessive risk taking patterns. According to the IMF Global Financial Stability Report (April 2014), the estimated implicit TBTF subsidy granted to euro area G-SIBs in 2011-12, in terms of funding cost advantage was between $ 90 to 300 billion. Aligning incentives between shareholders and bondholders on one side and management on the other, and reducing the TBTF moral hazard problem is the key mechanism through which capital increases and bail-in measures are expected to rein in excessive risk taking behaviour. After all, shareholders require an adequate return to the risk they are

taking, but they are not necessarily risk lovers. Neither the holders of bail-in-able debt. Therefore, even though a lot of emphasis is given to the ex post loss absorbing function of capital and other bail-in-able liabilities, incentives are expected to play a fundamental role in defining ex-ante the trade-off between safety and lending to the real economy. The mechanism of bail-in-able liabilities should indeed bring back market discipline: risks on the shoulders of shareholders and creditors. Krahnen and Moretti in this issue see the bail-in-able principle as a 'greenhouse' to nurture market discipline. But applying this theoretically appealing nurturing principle to the real world, they argue, is very difficult and very much depends on the design of the bail-in mechanism. As we will discuss below in the section on TLAC, the alignment of incentives might be effective in reducing risk taking only to the extent that shareholders or holders of bail-in-able liabilities have an adequate and effective saying in the management of banks, which in practice is not always the case.

Bail-in and absorptive capacity: the ex post tackling of systemic risk

A final issue is how far the measures under discussion are able to provide an adequate buffer for loss absorption, and of course this is especially crucial for large systemic banks, affected by the TBTF syndrome that makes the use of taxpayers funds ever more likely. The key issue here is the size of these buffers. On the one hand, bail-in-able liabilities and equity should have an adequate size to preserve the crucial activities of a bank even after a major distress. On the other hand, buffers should be sufficient to avoid externalities on other components of the financial system and to protect taxpayers. This will very much depend on the nature and the size of the systemic crisis and on the characteristics of the holders of the bail-in-able liabilities, as we discuss extensively in the TLAC section below (see also Krahnen and Moretti in this issue).

2. TLAC specific issues

Rationale and implementation

Several contributions to this issue discuss TLAC extensively (Beck, Krahnen and Moretti, Clerc, Gracie, Salleo and Fernandez de Lis). The piece by Gracie provides a thorough descriptions of the key features of TLAC and a clear

discussion of its rationale and expected effectiveness. This can be compared to the other pieces in this issue, which take a more nuanced view and highlight several critical features of this measure.

TLAC at the moment is the key topic in the policy debate on loss absorbing requirements. This for three reasons. First because it is still under definition: the FSB is still revising its term sheet following a first round of comments and is carrying out an impact assessment exercise. Second, because provisions are very sizable: banks should hold a minimum amount of regulatory capital (Tier 1 and 2) plus long term unsecured debt that are together at least 16%-20% of their risk weighted assets, at least twice the Basel III total regulatory capital of 8%) and the leverage ratio cannot be below 6% (twice the Basel III leverage ratio). Third, because it only applies to G-SIBs. For this reason we devote a section of the editorial to discussing its key ingredients (see also the section on the regulatory framework).

In the words of the FSB (2103), TLAC has been explicitly proposed as a measure to address the TBTF problem that "arises when the threatened failure of a systemically important financial institution leaves public authorities with no option but to bail it out using public funds to avoid financial instability", therefore encouraging ex-ante these intermediaries "to take excessive risks". Indeed, the additional capital and absorptive capacity identified by TLAC requirements should allow a bank that is negatively affected by a shock to have sufficient loss absorbing and recapitalization capacity so that, during and after a resolution, it continues to provide its critical functions at no cost for the taxpayers and without affecting the stability of financial markets.

The general principle to achieve this desirable outcome is that of bail-inable liabilities, i.e. financial instruments held by G-SIBs that can be written down or converted into equity in case of resolution. In particular, whenever Basel III minimum required capital is eroded, there should be a sufficient amount of TLAC-instruments that can be written down or converted into equity so that the G-SIB, or part of it, still complies with the Basel III minimum capital standards, and can thus continue its critical activities.

Effectiveness

While the rationale supporting TLAC is indeed solidly grounded in economic theory, whether its practical application will achieve the final objective

of reducing the TBTF problem is still the object of passionate discussions. In particular, it is not clear if TLAC would avoid the emergence of a crisis like that of 2008. And, even if it did, it is not clear if it is the most effective way of achieving such an objective.

With respect to TLAC's ability to limit the probability of a new financial crisis, the problem hinges on its power to achieve two intermediate objectives: limiting ex-ante the moral hazard problems that might lead to excessive risk taking and therefore increasing the risk of a financial crisis, and contrasting ex-post the systemic effect of the default of a G-SIB on the entire financial system.

As it is argued by Jean-Charles Rochet (this issue), moral hazard problems typically plague managers' risk taking attitudes, rather than those of shareholders or holders of bail-in-able securities. Indeed, the ample literature on the agency problems of corporate control suggests that a much more effective regulatory tool to reduce banks' risk taking should focus on managerial incentives, rather than on shareholders' and bondholders' incentives to control managers' decisions. Clearly, the transparency of the potential losses faced by shareholders and holders of bail-in-able securities is a crucial aspect affecting TLAC effectiveness in limiting moral hazard. As argued by Gracie in this issue, also imposing higher standards of governance to managers and defining a framework where individuals are held accountable for their decision is an important complementary tool to affect banking behaviour (see also the Bank of England's Fair and Effective Market Review Report).

A further question is how far TLAC provisions are able to achieve the second intermediate objective, i.e. whether privately funded bail-ins can act in the same way as publicly funded bail-outs and therefore creating an effective shelter for tax payers. We should recall that a key objective of the TLAC provision is distributing more equitably the costs of the distress of a TBTF institution. In this respect, numerous issues emerge.

First, there is an issue of *size*. Will each bank's TLAC suffice to avoid disruption of the bank's critical activities? Depending on the perspective one takes, TLAC provision could either be too large or too small. If only a strict perimeter of crucial activities will have to be preserved the size of the buffer does not need to be exceedingly large. According to Clerc, the empirical evidence suggests that the need for recapitalisation of distressed systemically

important institutions has been historically and on average in the range between 4 to 6 percentage points of total assets.

Yet the adequacy of the size of the shelter will very much depend on whether we are dealing with idiosyncratic versus systematic shocks. The contingency of the potential default of one or few G-SIBs may be controlled by TLAC. But the effects in the event of a crisis hitting a large set of intermediaries exposed to similar systematic risks might be impossible to face with TLAC, because of the undeniably large negative impact on the financial system of a large number of conversions and write-offs. In principle, this argument calls for a large, as large as possible, size of TLAC. Yet, this involves a high cost of funding with possible negative effects on lending, growth and welfare, as argued above (see also Clerc in this issue)

A further counterargument to having an as-large-as-possible buffer is related to the problem of *risk shifting*, which is a *second* crucial issue per se. TLAC requirements will lead to the issuance of a large amount of CoCos (contingent convertible securities) and other subordinated debt liabilities. The expectation is that large investors with a wide capacity of risk diversification across time and sectors will buy these bonds. Mind goes directly to large pension, insurance and investment funds. However, as argued by Persaud (2014), large institutional investors with these characteristics are not uniformly spread across developed countries, and may not have the capacity or the willingness to acquire the amount of financial assets that will be issued. Given that other large banks are obviously penalized by regulations when they acquire TLAC-instruments issued by other G-SIBs, it is not unlikely that a significant chunk will end up in the portfolio of hedge funds. But the management style of these financial intermediaries is unlikely to help stabilizing the financial system in the event of distress. And even if large institutional investors were able to subscribe the majority of TLAC-instruments issued by G-SIBs, it is not clear what would be the impact of a large crisis on the value of their assets. A significant drop in the value of the portfolio of the ultimate holders, the households, might in the end make a bail-out using the taxpayers' money very likely, precisely as in the case of banks' bail-outs.

TLAC seems therefore adequate for saving the functioning of a few G-SIBs that might eventually get into troubles from default, but, notwithstanding its size, probably inadequate to avoid a global crisis like the one of 2008, that

was not caused by the default of a single financial intermediary but by the faults of a business model in which credit and maturity risks were largely hidden and underestimated. In such a scenario, even with TLAC, public intervention would be unavoidable.

A *third* key issue related to TLAC has to do with the *complexity* of contingent financial instruments.

Financial instruments that are eligible for external TLAC requirements are unsecured subordinated liabilities, some of which are convertible, and more senior liabilities (see the Regulatory framework section). These instruments will become an intermediate category between common equity and more general or operational liabilities. The former will be used to absorb losses before insolvency, and the latter will be converted into new common equity to recapitalize the surviving entity, or will be written off. The problem is that the management and the identification of these instruments also raises several difficulties. Even though conversion of bail-in-able debt into equity is probably a superior option than writing down debt from an incentive point of view, CoCos are complicated financial instruments, possibly rather opaque, prone to speculative attacks when the bank is in proximity of the trigger point for their conversion. Undeniably, their characteristics are not yet well understood, the more so in the event – in the *contingency* – of a financial crisis. While the mechanism of increasing bank capital after conversion is straightforward, its impact on the ex-ante probability of a self-fulfilling idiosyncratic or even systemic default requires credible mechanisms of market or regulator induced triggers, as extensively discussed by Krahnen and Moretti in this issue. .

Moreover, also other forms of subordinated debt may be expensive and markets not sufficiently large to absorb the capital shortfall of GSIBs. According to Clerc in this issue the current size of the market for bail-in-able debt is roughly €100 billion, and the shortfall with respect for the TLAC requirements is estimated to be more than €1000bn. As shown in the number section, the ratio of subordinated debt on total assets is very small, for banks in the largest four EU countries. In contrast to this view, Gracie in this issue argues that UK G-SIBs have recently been able to issue TLAC eligible liabilities at prices similar to their wholesale funding.

A further complexity issue is that the set of eligible instruments that banks can use (and consequently the likely cost of their TLAC liabilities) is not neu-

tral with respect to their business and organizational model. This stems from the fact that, with respect to the explicitly identified excluded liabilities (see the FSB Consultative Document, November 2014), TLAC-instruments eligible for bail-in must be either structurally subordinated (i.e. issued by an entity that does not have excluded liabilities, for example a holding company), or contractually subordinated, or statutorily subordinated (i.e. junior in the statutory creditor hierarchy to the excluded liabilities). This implies that banks organized as holding companies are free to use senior debt which has a much deeper market than subordinated debt, if they do not have excluded liabilities in their balance sheet. In contrast, banks organized as operative companies issue also excluded liabilities which rank *pari passu* to senior debt. In this case senior debt is eligible for TLAC requirements only if it is explicitly identified as junior to the excluded liabilities by contract or statutorily, i.e. by law or if authorized by the resolution authority. In case of statutory subordination, senior debt would satisfy TLAC requirements only up to 2.5% of risk weighted assets, as of the FSB Consultative document.

Even though Gracie in this issue argues convincingly that in the longer term returns on different types of eligible TLAC liabilities will tend to equalise, it is true that presently market conditions for these debt instruments differ, and that the adjustment is likely to be more costly and cumbersome for banks not organised as holdings. Clear cut neutral rules for all types of banks would reduce the complexity in the implementation of the instrument and favour a level playing field regulatory environment.

A *fourth* and related issue is that the implementation of TLAC is also *non neutral* with respect to the banks' business models and how they will evolve in the future. Broadly, two organisational frameworks for the implementation of TLAC have been envisaged: the "Single point of entry" (SPE) and the "Multiple point of entry" (MPE). As extensively discussed by Krahnen and Moretti in this issue, under SPE only the top-level holding company of the group would be resolved and recapitalized. As a consequence, TLAC requirements will fall on that holding company for the entire group. With MPE it is instead explicitly recognized that G-SIBs operate in different countries in which they have subsidiaries that for example can issue their own debt. In this case, TLAC requirements would be imposed to those subsidiaries, in order to allow for independent resolution in different countries. Along this process, such subsidiaries might indeed

become no longer affiliated to the original holding group. Krahnen and Moretti argue that even if the MPE organisational model might in principle limit the risk of contagion across different subsidiaries of the bank, it might at the same time limit important opportunities for risk diversification, increase TLAC requirements and also favour ring fencing across financial markets.

At this stage of the debate it is not clear yet what the final decision concerning the implementation of TLAC along these two separate models will be. But it is unquestionable that a biased approach might favour one organisational structure with respect to another, creating an unlevelled playing field for different banks in the short run and possibly fostering costly reorganizations in the medium to long run. As convincingly argued by Fernandez de Lis (this issue), it is therefore crucial that authorities develop "a business model-neutral TLAC approach", where the interplay between the level at which TLAC is required and the interaction between different national supervisory authorities are carefully considered.

A *final* issue is the potential overlap between *different layers of regulation*, not always fully consistent one with the other. TLAC requirements are similar in scope to the minimum requirement for own funds and eligible liabilities for bail-in (henceforth MREL) within the Bank Restructuring and Resolution Directive (BRRD), which applies to all banks (not only G-SIBs). MREL is discussed at length by Gracie and Krahnen and Moretti. MREL are in fact conceived by the European authorities to have shareholders and creditors sharing most of the burden of recapitalizations. Similar to TLAC-instruments, MREL liabilities will be written down to recapitalize an unviable bank so that the critical functions of the bank are kept ongoing. The main difference with TLAC requirements, though, is that MREL requirements are defined specifically at the level of each single institution and depend on the resolution plan that it has adopted. For these reasons, MREL requirements will be imposed either at the level of holding company or at the subsidiaries' level, depending on the provisions of the resolution plan. MREL and TLAC must therefore be made fully consistent.

Alternatives to TLAC

If there are limits and critical issues in the potential effectiveness of TLAC in absorbing losses of large banks and avoiding systemic events, the question then turns to whether there are other, more effective or complementary means

of achieving the same objective. The answer to this question clearly hinges on a proper identification of systemic risk, that would require a too long discussion for the purposes of the current analysis. However, it is worth mentioning that the recent literature on contagion has casted many doubts on the possibility that the default of a single bank may spread to the entire financial system. The systemic risk posed by the default of a G-SIB seems to be much less relevant than the systematic risk caused by the exposition of a large number of intermediaries to a common global shock. Since the latter can be better controlled by macroprudential policies than by a time invariant capital surcharge like TLAC, the issue comes to whether TLAC is an effective and more equitable way of distributing the costs of the default of one or two G-SIBs.

Assuming, as it is likely to be the case, that even with well defined living wills, recovery and resolution procedures are insufficient to guarantee that in the event of a crisis a G-SIB can continue to provide its basic services (deposit, lending and payments system), at least two alternatives, or complements, to TLAC can be considered: recovery and resolution funds, possibly funded by the industry, or a strict separation between traditional and safe retail banking activities from the riskier investment bank activities.

Recovery and resolution funds, especially if financed by the industry, are a fairer way of saving a large G-SIB from default than using taxpayers' money. As such, they provide an alternative, or a complement , to TLAC to distribute more equitably the costs of TBTF. However, two issues should be considered when comparing the efficacy of Recovery and Resolution funds with that of TLAC. First, the overall costs for banks of a large enough recovery and resolution fund might be very similar to that of TLAC. Second, each bank's contribution to the fund should be proportional to its riskiness, that is always difficult to assess. In this respect, while recovery and resolution funds are a cornerstone of any strategy to limit the impact of banks' default, TLAC might be a complementary tool, that is already calibrated to each bank's risks and facilitates recovery and resolution procedures by making some decisions contractually agreed and binding ex-ante.

The second alternative to TLAC is a stricter separation between traditional banking activities and riskier investment banking activities, along the lines suggested by Vickers (2011). Since traditional banking activities are not per se risk free and pose themselves moral hazard problems, as shown for example

by the saving and loans crisis of the Nineties in the United States, TLAC might indeed provide an additional tool for limiting the costs of a default also for the traditional, retail arm of a G-SIB. Krahnen and Moretti in this issue show that there are large complementarities between these 'structural reforms' and the TLAC requirements, but the nature of these complementarities rests on the way TLAC requirements are implemented and designed.

We think the current policy debate on capital requirements for large banks is a challenging and exciting arena for discussion and interaction between economists, decision makers and the industry. It is indeed an unique opportunity to clarify the different positions and views of many different actors. We hope that the contributions of the different authors in the first issue of the new journal "European Economy" will provide food for thought to our readers. Have fun!

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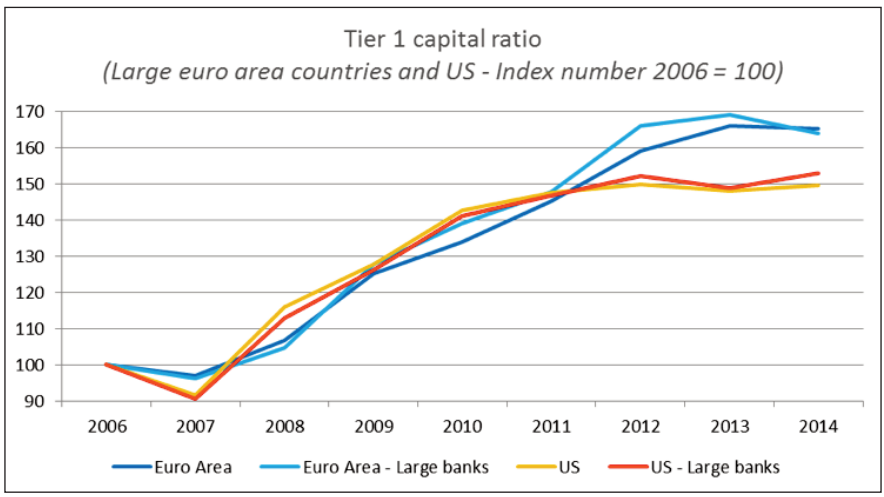
Numbers[4]

by Maria Teresa Trentinaglia[5]

Figure 1



4. Data in Figures 1, 2, 3, 6 and 7 refer to all banks with more than one billion of euros of total assets at least in one year between 2003 and 2014, as recorded by Bankscope. Large euro area countries are France, Germany, Italy and Spain. Large banks are defined as those with a level of total assets above the 95th percentile of the distribution by total assets in 2014. ROE is defined as net income over average total equity; Leverage is the ratio of total book assets to total book equity; risk weighted assets are include floor/cap according to Basel II requirements (Bankscope code 30700); Tier 1 capital is code 30660 in Bankscope; subordinated debt is total subordinated debt on balance sheet (Bankscope code 18159). Data are at the consolidated level (code is C1 when available and C2 when not C1 is not available).
Figures 4 and 5 are from the ECB datawarehouse.

5. University of Milan

Figure 2

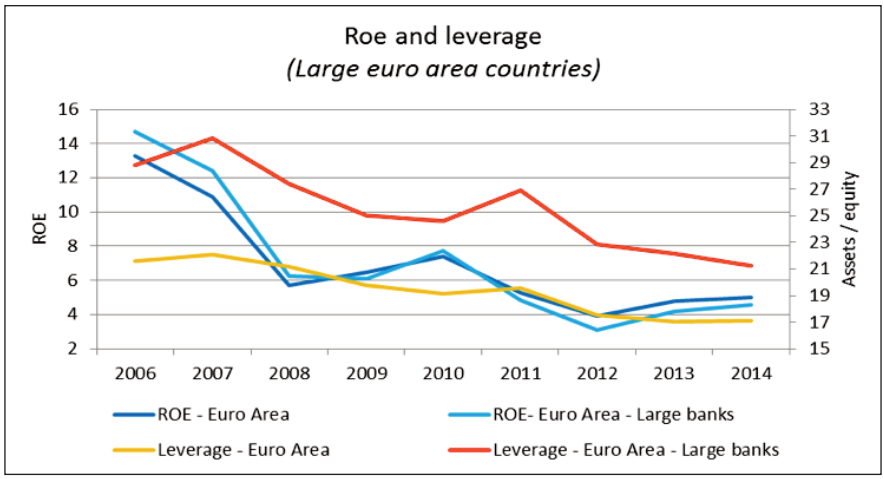


Figure 3

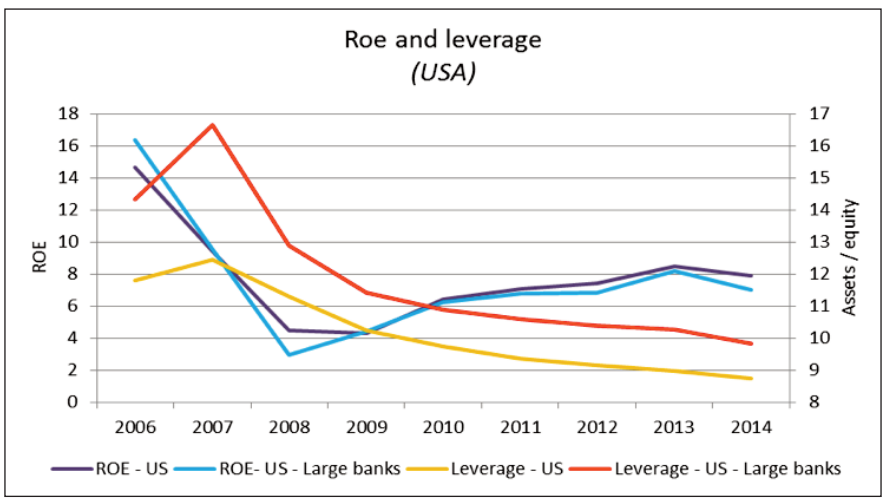


Figure 4

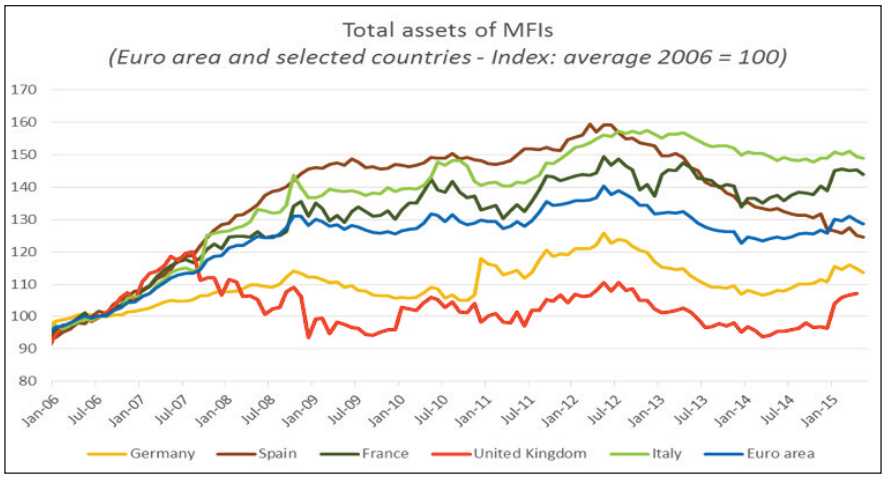


Figure 5

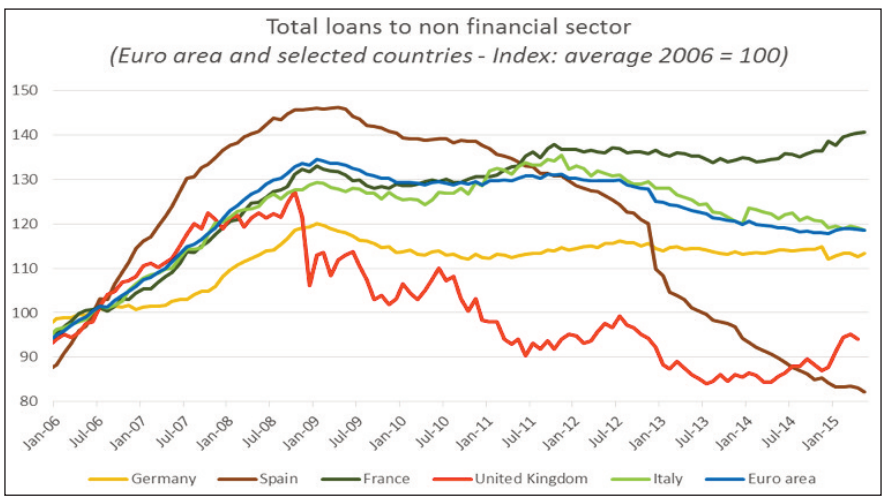


Figure 6

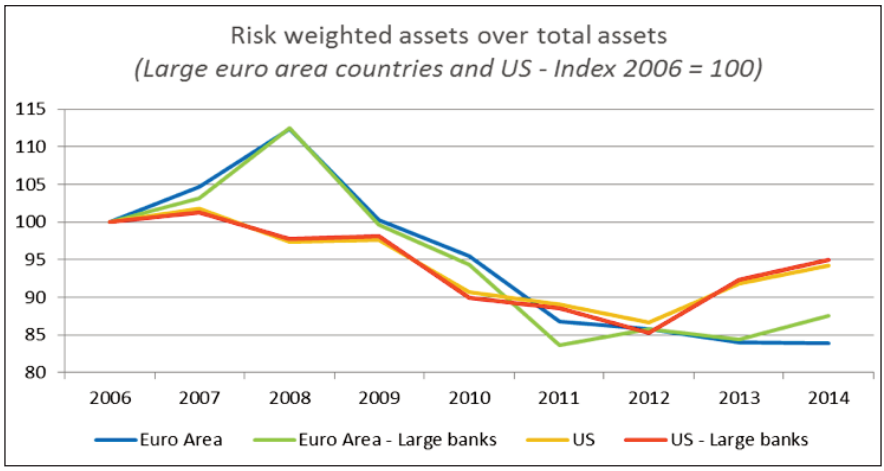
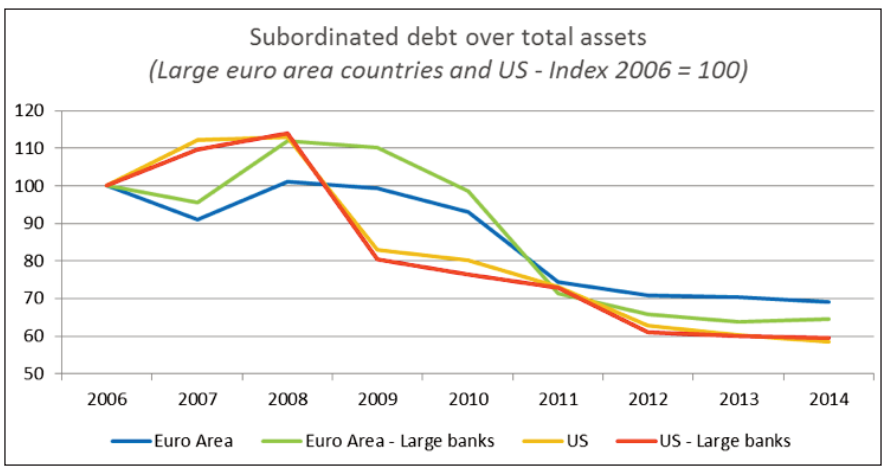


Figure 7



Institutions

by Maria Teresa Trentinaglia

Bank capital regulation in developed (and may developing) countries is based on the framework set by the Basel Committee in Bank Supervision in its document published in 2010 and revised in 2011 "Basel III: A global regulatory framework for more resilient banks and banking systems".

Basel III requires that banks hold at all times 4.5% of Common Equity Tier 1 (CET1) of risk-weighted assets (RWAs) and an extra 1.5% of Additional Tier 1 (AT1). From 2019 onwards, minimum Tier 1 capital must be 6% and minimum Total capital 8% of risk-weighted assets. In addition, banks are required to hold a capital conservation buffer of 2.5% of risk-weighted assets. Global systemically important banks (SIBs) have in addition a progressive Common Equity Tier 1 (CET1) capital requirement ranging from 1% to 2.5%, depending on a bank's systemic importance. For banks facing the highest SIB surcharge, an additional loss absorbency of 1% could be applied as a disincentive to increase materially their global systemic importance in the future (see "Basel III: A global regulatory framework for more resilient banks and banking systems"). National regulators are further allowed to require a discretionary counter-cyclical buffer, up to 2.5% of RWAs and to be held in the form of CET1 capital, during periods of high credit growth. Finally, Basel III introduced a minimum leverage ratio of 3%, defined as the ratio of Tier 1 capital over bank's average total consolidated balance sheet and non-balance sheet on a non-risk-weighted basis.

In the European Union, Basel III has been implemented mainly through the Capital requirements directive (CRD IV) and the Capital requirements reg-

ulation (CRR IV). In the United States, Basel III has been implemented mainly by a Decision of the Federal Reserve Board. Both legislations were approved in 2013 and allowed a few years for full phasing-in. Major differences between the US and EU rules implementing Basel III include the treatment of capital instruments, risk weight calculation, the leverage ratio and references to external credit ratings. Bradley K. Sabel (2013) discusses the major differences.

The new European rules require the adoption of a large number of delegated and implementing acts, for example on Regulatory Technical Standards and on Implementing Technical Standards. The European Commission provides continuous updates on progress. With respect to capital requirements, the Delegated act on the leverage ratio – 10.10.2014 ensures that EU credit institutions and investment firms use the same methods to calculate, report and disclose their leverage ratios which express capital as a percentage of total assets (and off balance sheet items).

The approach to Total Loss Absorbency Capacity (TLAC) is described in a consultative document produced by the FSB in November 2014. According to the proposal, G-SIBs must hold a minimum amount of regulatory capital (Tier 1 and 2) plus long term unsecured debt that are together at least 16%-20% of its RWA (at least twice the Basel III total regulatory capital of 8%). Regulatory capital and unsecured long term debt cannot be less than 6% of its leverage exposure (at least twice the Basel III leverage ratio) and, in addition to the Pillar 1 requirement, TLAC may also include a subjective component (Pillar 2) to be assessed on an individual basis.

TLAC should consist of liabilities that can be converted into equity or written off during resolution (without disrupting critical functions or giving rise to compensation claims).

Financial instruments that are eligible for external TLAC requirements are unsecured liabilities issued by the bank with remaining maturity over one year and, with respect to the excluded liabilities that have been explicitly identified, they must be either structurally subordinated (i.e. issued by an entity that does not have excluded liabilities), or contractually subordinated, or statutorily subordinated (i.e. junior in the statutory creditor hierarchy to the excluded liabilities).

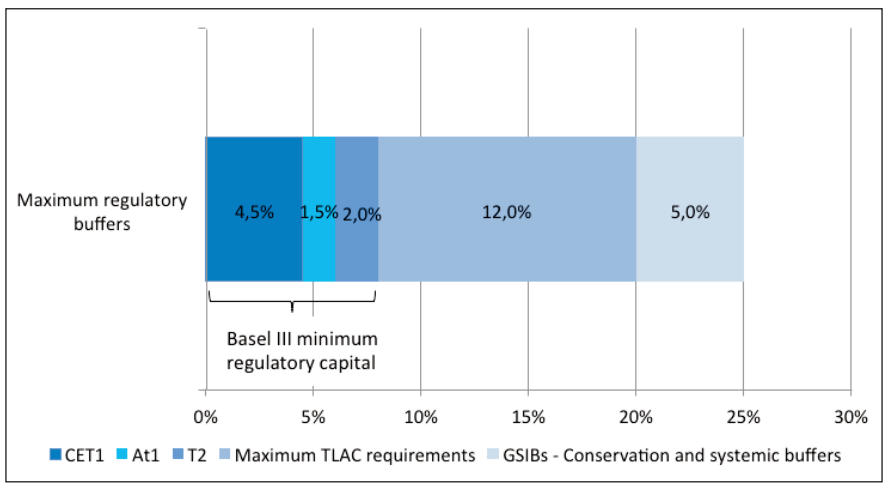
Regulatory equity capital could be counted for TLAC requirement, but debt instruments would need to constitute at least 33% of TLAC. Capital buffer re-

quirements (e.g. the capital conservation buffer, G-SIB surcharge buffer and countercyclical buffers), sometimes called "Pillar 2" instruments as for the FSB's proposal, are not counted for the TLAC requirements.

Losses during resolution may exceed TLAC: liabilities that are not eligible as TLAC remain subject to potential exposure to loss in resolution. If a G-SIB enters resolution, TLAC issued by the bank and held by external creditors would be written down/converted into the equity of the bank. Losses are therefore absorbed by shareholders and then by external creditors.

Depending on the preferred resolution strategy, resolution entities may be the top-tier parent, holding company, intermediate holding companies, or subsidiary operating companies. The resolution group is formed by the resolution entity, and any direct and indirect subsidiaries of the resolution entity. A G-SIB may consist of one or more resolution group (from a single resolution group with the parent company, or it may consists of two or more resolution groups) in which case minimum TLAC requirement should apply to each resolution entity.

Maximum total regulatory requirement following the introduction of capital buffers and TLAC, as of latest FSB proposal.



A bird eye (re)view of key readings

by Maria Teresa Trentinaglia

This section of the journal indicates a few and briefly commented references that a non-expert reader may want to cover to obtain a first informed and broad view of the theme discussed in the current issue. These references are meant to possibly provide opposing views of the debates. More detailed and specific references are available in each article published in the current issue.

On the cost of additional capital requirements

The Bank for International Settlements (BIS, 2011) estimates that the macroeconomic costs of additional capital requirement is expected to be low and the macroeconomic benefit (in terms of strengthening the resilience of the macroeconomic system) much higher. Consistent with these results, the general manager of BIS argues in favour of increasing capital requirements illustrating that the observed increase of requirements after the crisis had not the strong feared negative effects and is in favour of the use of TLAC (Caruana, 2014). On a similar line, Admati et al. (2013) argue that the cost of additional capital is less than what is normally claimed, because more capital increases banks' resilience thus reducing the risk so that the cost of capital must decline with the bank's capital. Kashyap et al. (2010), and Miles et al. (2012) report empirical estimates of the costs of higher capital requirements, also showing that the socially optimal capital of banks is higher than what is currently con-

templated in Basel III. Along the same lines, also Roger and Vitek (2012) have estimated a small macroeconomic cost of a synchronized global increase in bank capital adequacy requirements under Basel III.

Contrary to these views, the Institute of International Finance, the leading global association of financial institutions, stated that Basel III rules may reduce GDP by 3.2% by 2015 (IIF, 2011). Aiyar et al. (2015) also argue that the banks' cost of rising capital requirements is high and may thus lead to strong adverse effects on banks' lending. Hence, these authors strongly advocates the use of contingent convertibles (CoCos) as opposed to simply imposing higher capital requirements. Estimates of the first effects of additional capital requirements imposed post-crisis are provided by Cohen and Scatigna (2014). A preliminary study by Bloomberg (2015) argues that the cost of meeting the additional requirements of TLAC regulation will be very high.

Finally, a rich and balanced discussion of theoretical and empirical evidence on the effectiveness and costs of capital requirements is in the contributions of the current issue, in particular, Beck (2015), Clerc (2015) and Rochet (2015).

On contingent convertible securities, bail-in securities and structural reforms

The functioning and role of Contingent Convertible Securities (CoCos) is explained in details by Calomiris and Herring (2013). For earlier references, see also Flannery (2005), who proposed ten years ago the introduction of an instrument that would convert to common equity when a bank's market capital ratio falls below a pre-stated value), and Raviv (2004). French (2010), in his chapter of the Squam Lake Report, also proposed the introduction of an hybrid security converting debt into equity on the basis of simultaneous triggers. Krahnen and Moretti (2014) presents a comprehensive review on the treatment and functioning of CoCos and of other bail-in procedures. For a relatively recent account of actual CoCos issuance see Bank of Norway (2014). Criticisms on CoCos have been put forward by Admati et al. (2013), who state that these instruments are not convincing because of complications on triggers and conversion rules, and of the implicit tax subsidy of debt financing as compared with equity. Strong criticism on bail-in securities is purposed in

Persaud (2014). A deep and detailed analysis of loss absorbing capacity of international banking groups is offered by Gracie (2014).

For a detailed discussion on CoCos and total loss-absorbing capacity (TLAC), see also Salleo (2015) in this issue. A clear and streamlined illustration of the FSB 2014 proposal on TLAC (see the "Regulatory framework section" in this issue) is in BBVA research (2014).

A different approach with respect to increasing the loss-absorbing capacity of banks with higher capital requirements or asking them to issue bail-in securities advocates the introduction of structural reforms on the structure of banking activities. Vickers (2013) and the Vickers' report (2011), for example, suggest to ring-fence retail activities from other banking activities. Instead Crawford (2014) and Guynn and Kenadjian (2015) are strongly against the structural solutions to the TBTF problem, and are in favour of the introduction of bail-in securities and TLAC in particular.

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Leading Articles

The Bank Capital Controversy[6]

by Jean Charles Rochet[7]

The global financial crises of 2007-2009 has shattered our confidence in economic theory. After more than twenty years of intense academic research in banking economics, we realize that we still do not know much. For example, economists continue to often rely on the efficient market hypothesis, and on the Modigliani Miller theorem, which we know are based on strong and unrealistic assumptions.

Policy makers need more realistic models to guide their decisions on financial stability, in particular with respect to the appropriate level of capital requirements for banks, that is the focus of this note (albeit the line of reasoning that I will propose has a broader reach).

Straight after the crisis, the observation of the current limits of economists' models and academic research was a fantastic opportunity for the economic profession to try to sit together and find a consensus on new paradigms that will help policy makers. But, in fact, on the specific question of bank capital, the opposite has happened, with the polarization of the debate and currently two groups that refuse any dialog.

On the one hand, the group led by Anat Admati and Martin Hellwig recommends a minimum capital ratio of 30%, as reported in their new book "The

6. This text is based on a talk given by the author in occasion of the Vilfredo Pareto Lecture "The Bank Capital Controversy", on June 4th at the Collegio Carlo Alberto (http://www.carloalberto.org/) in Turin. The link to the video of the lecture is http://www.carloalberto.org/events/special-lectures/show/vilfredo-pareto-lecture2015.

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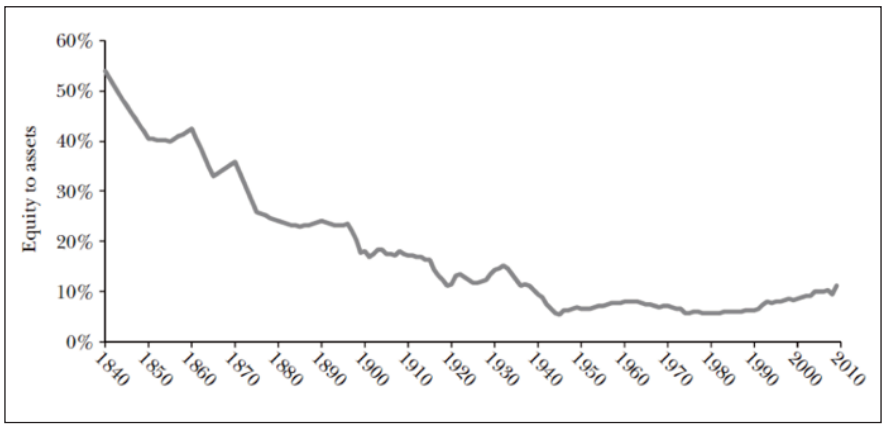
Bankers' New Clothes: What's Wrong with Banking and What to Do about It". Although they are in favour of higher capital for banks than it is currently the case, and so am I, it is disappointing to notice that there is not a single quantitative argument in the book that justifies such a figure. These authors do not offer scientific arguments nor quantitative analysis in support of their thesis and, still, they are currently backed by very influential and prestigious people such as Roger Myerson, Mervyn King and the journalist Martin Wolf.

On the other hand, the group that we can call "the Business School economists", such as Gary Gorton, and more recently, Harry DeAngelo and René Stulz, think that high leverage is desirable for banks. Their reasoning is that banks have to provide liquidity to investors and if one forces banks to have too much equity, then they will provide too little liquidity. We do need a model to properly address and support these types of claims.

The current dismal state of affairs is that instead of having worked hard to develop new models, those two groups have kept their ideological positions.

The urgency of a different approach can be noticed by observing, for example, the evolution of bank capital ratios in the US from the nineteenth century until today. Clearly, this shows a downward trend: in the 1840s the capital ratio was higher than 50%, while in the recent years it went down to less than 10%.

Figure 1: capital ratios of US banks 1840- 2010 (ref: Hanson, Kashyap and Stein 2010)



Indeed, the presence of a downward trend in capital ratios does not prove anything, because many other things changed over this long time span. Blaming on the decline of capital ratios without further analysis would be as claiming that the downward trend of the world record for the 100 meters male sprinter in the last 70 years is a dangerous path and we should rather slow down.

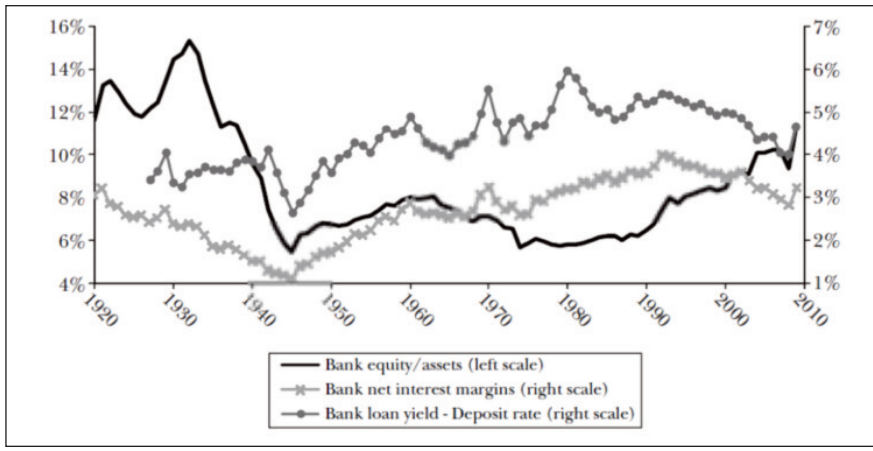
Of course many serious empiricists have done empirical studies on the correlation between banks' leverage, growth, systemic risk. And they almost unanimously suggest that there is a trade-off. On the one hand, higher capital ratios imposed to banks or, similarly, less leverage or a tighter limit on banks' loan supply, improve systemic stability, because allow banks to absorb larger losses. On the other hand, these measures negatively affect growth, because they restrict lending to the economy.

However, this association between banks' leverage, growth and systemic risk is just a simple correlation and, as many have argued, cannot be interpreted in terms of causality. In this respect, Steve Ongena from Zurich University and his co-authors have convincingly emphasized that to disentangle demand and supply effects within a proper structural model one needs micro-economic data on single bank relationships, which are often confidential, rare and difficult to investigate.

These intrinsic limitations show why theorists can have a fundamental impact in our understanding. To do proper economic research one needs both data and theory, but if a proper structural model to identify causality links is not available, the best one can do is to interpret correlations with the help of theoretical models. Consider for example, the evolution of bank capital ratios in the US in the last 90 years (Figure 2).

Plotting the capital ratio against the spread between loan and deposit rates or against the interest margin, one cannot identify a clear correlation, or any kind of statistical regularity. This is normal. Because both variables are endogenous and vary over time, in order to understand and interpret these empirical observations, one needs a model that explains these movements together.

Figure 2: banks capital ratios and loans spread (ref: Hanson, Kashyap and Stein 2010)



Going back to the main theme under analysis, we are therefore to ask ourselves what is the role of bank capital. If we believe in the Modigliani and Miller theorem, the dimension of a bank's capital should not matter, because the structure of the liabilities of the bank is irrelevant within the framework of this theorem. But clearly this is not a very satisfactory answer, and we need to go further in our research; in particular, we need to account for the role of frictions in our paradigm of analysis.

Before further elaborating, it is important to clarify the precise and specific role of capital that is of interest in the present discussion. Most academics, including Jean Tirole, have emphasized the role of bank capital in providing incentives for bankers. It is the idea of having some "skin in the game": if you have a lot to lose in the bank that you have financed, then you will be more careful about the risk that your manager takes. Although this is the leading paradigm among economists, and it was at the center of the discussion around the first Basel pillar, it turned out that there was a major misunderstanding with regulators. What regulators have in mind about the role of capital is completely different and has nothing to do with incentives. For regulators, bank capital is a buffer against losses, that protects depositors and that allows for some precious extra-time in the resolution in failing of banks. This is especially true for the so called SIFIs (Systemically Important Financial Institutions): more capital allows to absorb losses and to resolve a failing institution

in a proper and ordered fashion. Clearly, this has nothing to do with incentives which instead are affected by "inside equity": i.e., the equity that is held by the top management. This capital, which also includes the remuneration package of managers, has an impact on their risk taking behaviour – incidentally, it is useful to notice that regulators have finally considered the possibility to regulate bankers' compensation. However, if we look at the regulation of banks' *total* capital, this pertains not only to the tiny part that is held by managers, but also, and mainly, to the very large part that is held by shareholders that have no say on the decisions of the bankers. Regulation of banks' capital does not refer to managers' incentives, which should be dealt with by regulation of compensation. It has instead to do with loss absorbing capacity.

We are now at a crossroad. Economists, especially macro and monetary economists, have played a very important role in helping out central banks for monetary policy decisions. The development of the DSGE models – Keynesian type models with which it is possible to try to understand the impact of monetary policy interest rates on short term employment and growth – is a fantastic, even though sometimes criticized, success of our profession. For monetary policy we have models that one can simulate and that can be used in order to understand the consequences of changing short term interest rates. However, those models were designed for monetary policy, which has a short-time horizon and has certain objectives in terms of inflation and, to some extent, output; but that has nothing to do with financial stability. Financial stability is a long run objective and then it requires different models.

Although many economists have tried to introduce banks and financial frictions into DSGE models, these models are too complicated with so many interacting "blocks" (to reproduce data in the short term), that by adding another layer of complexity they lose transparency and the possibility to interpret the results. This is not a secondary issue, because this lack of transparency affects the accountability of policy decisions. In democracy, and for the sake of our economies, it is important that policy makers and people that take decisions on bank capital ratios, such as the Basel committee, are accountable for their choices. Why is that, until recently, we only required a 4% of capital and now apparently many people think that the appropriate level is 25%-30%? If a complex model and its complex numerical simulations deliver a certain desirable outcome by increasing capital ratios, why would we believe this out-

come? We do need models and, in particular, simple and transparent models, so that policy makers can explain and justify their decisions, avoiding to take them on the basis of ideology.

Fortunately, the quest for these simple models is something that several people are working on at the moment, and new interesting ideas are emerging, emphasizing the role of banks in the provision of liquidity, as suggested in DeAngelo and Stulz (2013) and Gorton (2013).

Indeed, banks provide liquidity and collect deposits, and also provide financing to firms. So, the crucial technology of a bank is to transform riskless deposits into risky assets. In this respect, equity is exactly what one needs to buffer the associated possible losses, so that depositors can be sure that in any circumstance they will get their money back. Hence, liquidity implies completely risk free deposits. There are several new investigations emphasizing these dimensions. For example, Gennaioli, Sheifler and Vishny (2012 and 2015) have models in which depositors are infinitely risk averse, and that's the way to capture the notion that, if there is a risk in your deposit, then you might be unable to write a check on it. Similarly, Stein (2013) has a model in which bank deposits provide utility per-se, because of the liquidity of those deposits. Even Hellwig himself (2015) has a recent paper on this topic. He shows that the argument of DeAngelo and Stulz (2013) – according to which if one has too much liquidity there are then too little deposits or, in other words, that equity and deposits are substitutes – is completely wrong as soon as there is risk on the asset side. In this case, in fact, in order to provide safe deposits, a bank needs something to buffer the losses, and this is precisely capital.

But the main problem with these models is that they are static and therefore cannot be brought to the data, or even calibrated. This is why we need to explore this ideas in a dynamic setup. A few models have been recently developed in discrete time (e.g., De Nicolo, Gamba e Lucchetta, 2013) and also in continuous time, such as the very influential models by Brunnermeier and Sannikov (2014) and by He and Krishnamurhty (2012 and 2013). But these papers are quite complex, and as stated above, we need simple and transparent models to make policy decisions accountable.

This is the line of research I am currently working on, for example in Klimenko, Pfeil and Rochet (2015), "Bank Capital and Aggregate Credit". This is a general equilibrium model with frictions: the general equilibrium dimension is

needed to understand the feedback loops, frictions are needed to eliminate the indifference results of the Modigliani and Miller theorem. This model is in the spirit of Brunnermeier and Sannikov (2014), but it is much simpler because we used a Occam's razor approach to eliminate any ingredient that was not strictly needed to understand the role of bank capital. Although it is not the perfect model, it nevertheless provides an understanding of the impact of increasing capital requirements, both in the short term and in the long term. Importantly, we can notice that the short term impact is very different from the long term impact, and this is precisely why we need a dynamic model. The conclusion of this specific study is that, although the two short-run dimensions (stability vs. growth) are conflicting, in the long run, if the capital ratio is not unreasonably high, there is the possibility to reconcile them. In fact, it is possible to find an equilibrium where the economy is more stable and it grows at a higher rate, because people have a higher trust in the stability of the banking sector.

Developing a new class of macro models will be fundamental in the next years to understand the impact of financial stability decisions, because we do not want to accept purely ideological statements such as that bank capital should be 30% – or instead 4% – without knowing why this may be the case. And we do not want regulators deciding on the basis of pure authority arguments either. Economists will need to provide models and figures that come from a rigorous and scientific analysis. With this respect, simple models are valuable in that they enlighten the short term and long term impact of increasing capital requirements.

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Bank Capital – Panacea for a crisis-free banking system?

by Thorsten Beck[8]

1. Introduction

The Global Financial Crisis has given impetus for comprehensive and far-reaching regulatory reforms on the global, regional and national levels. The quantity and quality of capital requirements have featured prominently in these reforms. Analysts of the recent crises have pointed to precariously low levels of capitalization of many banks in the years leading up to the crisis, with some observers calling for a multiple in capital buffers compared to before the crisis (Admati and Hellwig, 2013). Rather than having taxpayers pick up banks' losses, equity holders are supposed to bear losses as residual claimants of banks. Others have pointed to the costs of higher capital requirement for real investment and economic growth (IIF, 2011). These debates often abstract from a more fundamental debate on the role of capital requirements in the regulatory and governance framework of banks and their critical interaction with other regulatory rules.

This short paper discusses theoretical and empirical evidence on the effectiveness of capital requirements. It will consider their role under both micro- and macro-prudential views of capital buffers. It will discuss different concepts – both risk-weighted and not-weighted requirements - and the interaction of capital requirements with other regulatory tools, including liquidity require-

8. Cass Business School, City University London and CEPR.

ments. Looking beyond the micro-prudential approach to capital requirements – focusing on individual financial institutions – the paper discusses the role of capital requirements in the new macro-prudential regulatory framework – both additional capital buffers for systemically important financial institutions and the variation of capital buffers over the business cycle. The paper then presents evidence on the effect of higher capital requirements as foreseen under Basel III on the real economy, stressing that forecasts of these effects need to distinguish between transitional and long-term effects. The paper also makes the argument that an exclusive focus on capital requirements might be less useful and that effective resolution frameworks that influence also ex-ante risk-taking incentives are an important complement to strengthened capital buffers.

The main regulatory reforms introduced after the 2007 financial crisis are contained in the new Basel III regulatory standards agreed upon by the 27 members of the Basel Committee on Banking Supervision during the period 2010-2011. The Basel III accord introduces new requirements on banks' capital and liquidity holdings. In particular, it introduces a stricter definition of capital, a higher quality and quantity of capital, two dynamic capital buffers, a minimum leverage ratio, and two minimum liquidity ratios. The major changes to capital requirements introduced with the new accord concern the greater focus on common equity, which was raised to 4.5% of the risk weighted assets, the introduction of a capital conservation buffer in the form of additional common equity for 2.5% of risk-weighted assets, as well as of a countercyclical buffer requiring a further range of 0-2.5% of common equity when authorities judge credit growth may lead to an excessive buildup of systemic risk. In addition to higher risk-weighted capital-asset ratios, banks are required to maintain a non-risk-based leverage ratio that includes off-balance sheet exposures as a way to contain the manipulation of risk-weights as well as the buildup of leverage. Finally, another addition is that the largest and most important banking groups, known as Systemically Important Financial Institutions (SIFIs), will have an additional capital requirement of 1-2.5%.

The Basel III accord is being translated into national law, though with important variations. For example, in the European Union, sovereign bond holdings still attract zero risk weights, even after the recent restructuring of Greek government debt in 2012. The leverage ratio has been set at different levels across countries and some jurisdictions, e.g. Switzerland, have decided to im-

pose additional capital buffers on their banks. While the Basel III accord foresees a transition period over which banks have to adjust their capital buffers, many banks have taken rather quick action, partly due to market expectations, partly due to regulatory pressures as in Europe with the Comprehensive Assessment by ECB and EBA.

Before proceeding, it is important to note that this is neither a full-fledged literature survey on capital requirements in banking nor a comprehensive assessment of recent regulatory reforms, but rather a short collection of some thoughts on the recent regulatory reforms and how they link to the literature on capital requirements. The remainder of this paper is structured as follows. Section 2 presents the micro-prudential view on capital, while section 3 focuses on the macro-prudential dimensions of capital buffers. Section 4 discusses evidence on the effects of higher capital buffers on lending and investment, while section 5 argues for a broader view on regulatory reform, with an emphasis on resolution frameworks. Section 6 concludes.

2. Bank Capital – the Microprudential View

Capital buffers have been traditionally seen as both a cushion to protect debtholders, including depositors and a disciplining tool that mitigates incentives for aggressive risk-taking, contained in the put option of bank equity. However, it is also important to understand the function of capital buffers in helping overcome agency problems between different stakeholders in the bank. The funding structure is an important metric in determining and overcoming agency problems between management and shareholders. Requiring banks to hold too much equity can create significant agency problems, as it isolates bank managers from market pressures and thus might lead to suboptimal investment decisions (Calomiris, 2013). Short-term debt, on the other hand, can serve as disciplining tool for bank management, helping overcome governance challenges within the bank. As modelled by Diamond and Rajan (2001), for example, deposit- and market-based funding of banks and their lending activities are critical complements to each other. As important as higher capital buffers are, it is therefore important to realize that they have an additional role in helping overcome agency problems between manage-

ment and shareholders and between these two groups and depositors. Critically, the effect of higher capital requirements on risk-taking decisions might vary with the ownership structure of banks, as empirically shown by Laeven and Levine (2009) and higher capital requirements might thus not always lead to lower risk taking. In this context, it is important to understand that the cost of equity for the bank is not the same as the return for the investor, given the agency and signalling costs of equity issues (Myers and Majluf, 1984). Related to this is also the observation that increasing the book value of equity does not map one-to-one into similar increases in true equity (Calomiris, 2013). This might also explain why capitalization assessments in the European Union based on book values provide different results than assessment based on market evaluations (Acharya and Steffen, 2014).

In summary, assessing the effect of higher capital requirements on the stability and efficiency of banks has to look beyond the dampening effect of higher capital buffers on the risk premium for bank equity, resulting from the lower risk of bank failure. First, equity holders most likely had the expectations of being bailed out before 2008, whereas recent regulatory reforms, including the bail-in rules in the European Union, make such a bail-out much less likely. Second, the screening and agency costs mentioned above still remain independent of the level of equity and it is not clear ex-ante whether these costs might actually be lower under the new regime of higher capital requirements.

An important discussion has been on the role of risk-weights for computing capital requirements. The Basel II accord included different models to risk-weigh assets, based on the conclusion that Basel I equalized weights for assets of very different risk profiles, inviting banks to focus on the riskiest asset classes for a given risk weight. Risk-weighted capital-asset ratios try to force banks to hold capital buffers appropriate for their level of risk-taking. The question is whether giving banks the option to calibrate these risk weights with the internal risk-based (IRB) approach invites manipulation to under-report riskiness of assets and thus overstate regulatory capital. For example, Mariathasan and Merrouche (2014) show for a sample of 115 banks from 21 OECD countries that the reported riskiness of asset declines upon regulatory approval of the IRB approach, an effect that is stronger among weakly capitalised banks. On a more general level, Haldane and Madouros (2012) argue for less complex rules, pointing to the costs of complexity and

its limited benefits. The leverage ratio, on the other hand, can be seen as a back-stop, a rather simplistic tool, but one that cannot be easily circumvented.

Evidence based on the recent crisis has also shown that unweighted risk-capital ratios before the crisis were a better predictor for banks' performance during the crisis than risk-weighted capital-asset ratios. Specifically, Demirguc-Kunt, Detragiache and Merrouche (2013) show that while capital ratios predicted stock market performance of banks during the crisis, this relationship was driven by non-weighted rather than weighted capital-asset ratios and by higher quality capital elements, including tier 1 capital and common equity.

We therefore face a trade-off to strike the right balance of (i) capital requirements fine-tuned to the risk decisions of financial intermediaries and market participants and (ii) simple metrics that cannot be easily circumvented. The solution to have both risk-weighted capital-asset ratios and the leverage ratio under Basel III takes account of this trade-off.

There is also an important interaction effect between capital and liquidity buffers, such as introduced under the Basel III accord. These include Liquidity Coverage Ratio (LCR) to withstand a stressed funding scenario and a Net Stable Funding Ratio (NSFR) to address liquidity mismatches. The LCR is a measure of an institution's ability to withstand a severe liquidity freeze that lasts at least 30 days and is defined as the ratio of High Quality Liquid Assets (HQLA) to total net cash outflows over the next 30 calendar days. The NSFR is designed to reveal risks that arise from significant maturity mismatches between assets and liabilities, defined as the ratio of the available amount of stable funding to the required amount of stable funding over a one-year horizon, which is required to be above one.

As the experience of recent crises has shown and as discussed by the recent literature, liquidity shortages – or the inability to roll over funding - might force banks into fire sales of assets, which in turn might undermine the solvency positions of banks. Brunnermeier (2009) discusses different mechanisms through which this interaction between the lack of liquidity and insolvency took place during the Global Financial Crisis, including loss and margin spirals, where initial losses require sale of assets or higher volatility requires higher margins on existing positions. Stronger capital and liquidity requirement might thus reinforce each other in reducing fragility risk, as for example modelled by Calomiris, Heider and Hoerova (2013).

3. Bank Capital – the Macroprudential View

The recent crisis has broadened the view from considering capital requirements purely on the level of individual banks to considering capital requirements as macro-prudential tool. While the micro-prudential view focuses on the stability of individual financial institutions, the recent crisis has taught us that the sum of individual financially stable banks is not a stable banking system. Systemic risk can be undermined by different factors, including asset price and credit cycles and contagion effects from idiosyncratic failures.

The macro-prudential agenda has two dimensions, a cross-sectional and a time-series. The cross-sectional approach starts from the observation that some institutions contribute more to systemic stability (and potentially systemic fragility) than others. Forcing these banks to hold stronger capital buffers can thus have positive repercussions for the stability not only of the institution in question but also the overall financial system. The Basel III accord has addressed this cross-sectional dimension by introducing additional capital buffers of 0.5 to 2.5 percentage points. The recent empirical literature has developed different gauges of systemic importance of individual financial institutions, including CoVar, which gauges the change in a financial system's Value at Risk when one particular institution is under financial stress, as measured by its own individual Value at Risk (Adrian and Brunnermeier, 2014), the Marginal Expected Shortfall, which gauges the expected contribution of an individual financial institution to overall equity depletion in the banking system (Acharya et al., 2012) and the SRISK, a measure of equity capital that a bank would have to raise in the event that the broad stock market falls by a specific large percentage over a six month period (Brownlees and Engle, 2012).

A second aspect of macro-prudential regulation is the time-series dimension. By its very nature, bank lending is pro-cyclical. As the borrowing capacity of firms and households varies with their net worth as much as banks' lending capacity varies with funding conditions, credit volume is more volatile than GDP, with these effects falling asymmetrically on borrowers of limited net wealth and higher opacity, thus mostly small businesses. The challenge is to which extent different concepts of capital exacerbate or might help reduce the procyclicality of bank lending. Repullo and Suarez (2012) show that the

Basel II capital requirements with a heavy focus on cyclically varying risk-weighs exacerbate lending volatility compared to non-weighted capital-asset ratios with negative growth repercussion, even though they provide stronger buffer against the failure of individual banks. Brei and Gambacorta (2015) show that the leverage ratio varies less with business cycles than the risk-weighted asset ratio. A lesser importance of risk-weights might thus help reduce the volatility of lending volumes over the business and financial cycle. The counter cyclical capital requirements – build-up of capital buffers in good times and drawing them down in bad times – provide another important tool to smoothen the lending cycle. It is important to note that counter-cyclical capital requirements are only one instrument in the rather rich toolbox of macro-prudential regulation, ranging from dynamic provisioning requirements over loan-to-value ratios for mortgage loans to lending limits. While several recent studies have documented the use of macro-prudential tools, including of counter-cyclical capital requirements, a more rigorous assessment is still in the early days concerning the effectiveness of such tools.[9]

4. Capital requirements and the real economy[10]

Changes in capital requirements can have important repercussions for lending costs, lending volumes and ultimately investment and economic growth. While the Miller-Modigliani theorem postulates the irrelevance of funding structures, the cost of equity and debt funding varies significantly in the banking sector (as in other economic sectors), for multiple reasons, of which taxation is only one and also related to the signalling and agency costs discussed above. While the Basel III process has provided for a rather generous timetable taking into account the current economic downturn, many banks, especially large and global banks, have tried to reach the higher capital requirements ahead of schedule, resulting in a significant capital shock. This does not necessarily have to lead to a reduction in lending if additional funding is raised on the market or through reducing dividends and share repur-

9. For a study of the effect of time-varying and bank-specific capital requirements, see, for example, Aiyar, Calomiris and Wieladeck (2014).
10. The following is based on Allen, Beck and Carletti (2013)

chases. However, in the case of most European banks, this boosting of capital ratios has been achieved through either reductions in lending or changes in the risk profile of asset holdings, given that capital raising on the market is rather unattractive in the current crisis circumstances. However, in the long-term, higher capital buffers might imply stronger reliance on external funding rather than retained earnings, if the banking system grows, thus involving higher costs (Calomiris, 2013).

While the previous literature studying the effect of changes in capital requirements (vanHoose, 2008) has pointed to mixed evidence concerning the effect of changes in capital requirements on bank lending, the changes under the new Basel III regime are significantly higher than previous adjustments and are thus more difficult to assess. It is important to differentiate between transitional and long-term effects of higher capital requirements. As some of the current adjustments come during the recession and trough of the lending cycle, the transitional effects might be stronger than the long-term effects.

Most studies gauging the effect of higher capital requirements point to a rather limited effect. With the exception of IIF (2011), most studies predict a rather moderate effect both on lending costs and ultimately on real investment. Specifically, Allen, Beck and Carletti (2013) report effects of between 20 and 110 basis points on lending costs and declines in GDP level of between 0.2 and 1 percent across several studies. One difficulty in this assessment that the increase in capital requirements is one of many regulatory reforms so that a stand-alone assessment might be difficult. Elliott et al. (2012) presents a scenario for Europe of the change in costs resulting from the various regulatory reforms for the major categories of financial institutions taking explicitly into account redistribution of funds across different segments of the financial system. Higher capital and higher liquidity requirements are expected to significantly increase the costs to commercial, investment and universal banking, which will shift business to life insurance, non-bank financial institutions and capital markets. The different regulatory changes will have a significant effect on costs for all types of banks and a benefit for other sources of finance in Europe, the U.S. and Japan. Using a loan pricing model that takes into account region-specific ROE targets, tax rates and operating costs, Elliott et al. estimate the net effect on the pre-tax lending rate from the change in capital requirements to be 9 basis points in Europe, 20 basis points in the US and 7 basis

points in Japan, thus a rather limited effect. Overall, the conclusion of the majority of the studies is that regulatory reforms will only have a modest effect on the cost of funding. In turn this will only have a small effect on the level of investment and aggregate output. Put differently, fairly extreme assumptions are needed to obtain a large effect. And these calculations only refer to the costs of higher capital requirements but not on the benefits stemming from fewer failures and a lower probability of systemic banking crises.

5. Looking beyond capital – allowing banks to fail

While capital buffers reduce the probability of insolvency, they bring shortcomings as we have discussed above. While nobody doubts the need for robust capital buffers, both from micro- and macro-prudential viewpoint, many economists have pointed to declining marginal benefits and rising marginal costs as capital requirements rise.

More importantly, the regulatory framework should not serve to prevent failure at any price. Failure is part of the market process and the perspective of failure cannot only increase market discipline but also competition in the banking system if coupled with a corresponding entry policy, as illustrated for example by Perotti and Suarez (2002). The objective of the regulatory framework should rather be to minimize the impact of such failure on the remaining financial system and the real economy. While the academic and policy debate has focused prominently on the prevention dimension of regulatory framework, the experience of the recent crises has focused the attention of academics and policy makers alike on the resolution part. The trade-off faced by policy makers in the design of failure resolution frameworks is to minimize the external costs of bank failure on the remainder of the financial system and the real economy, on the one hand, while enforcing market discipline, on the other hand, to thus reduce moral hazard risks. Minimizing external costs implies rapid intervention outside the regular court-based corporate restructuring framework, while enforcing market-discipline involves haircuts on creditors and equity holders according to their ranking.

Resolution frameworks across Europe have been significantly strengthened, on the national level, but also – with the bail-in clause introduced under

the Bank Recovery and Resolution Directive (BRRD) – on the European level. In addition, broadening the concept of loss-absorbing equity to total loss absorbing capacity (TLAC), which also includes unsecured debt and should amount to 16-20% of risk-weighted assets and at least 6% of total exposure, as suggested the Financial Stability Board, and the minimum requirement for own funds and eligible liabilities (MREL), under discussion in the context of the bail-in clause in the BRRD, are important steps towards reducing the likelihood and size of future tax payer funded bail-outs. Moreover, resolution and restructuring plans (also known as living wills) for larger banks should make the potential resolution of systemically important financial institutions easier. Critically, by sending a clear message that no bank is too large to fail, such rules, concepts and plans send a clear signal to risk-decision takers and mitigate moral hazard problems.

Having said this, there is no panacea in terms of moral hazard and the too-big-to fail phenomenon. Not only will there always be the chance of a perfect storm, but regulators always play catch-up with financial institutions, a theme I will return to below.

6. Conclusions

This short paper discussed recent regulatory reforms, focusing on capital requirements. I have argued that the discussion on the optimal level of capital requirements has been too limited to stability concerns, ignoring other roles and functions of capital in the funding structure of banks. But even in the context of reducing fragility risk, capital buffers have taken on additional functions, including in terms of macro-prudential tools. However, regulation should not focus on reducing the probability of failure to zero, but regulatory reforms especially on the financial safety nets should make bank failures more manageable.

While the debate has relied on an extensive literature, it has also opened new questions. What is the optimal level of capital buffers? What is the trade-off in terms of lending efficiency and risk of failure? The expansion of the capital buffer concepts toward macro-prudential purposes raises the additional question of the efficiency of counter-cyclical capital requirements, especially compared to other macro-prudential tools.

The question of the regulatory perimeter is as critical. As a more stringent regulatory framework imposes higher costs on banks (to thus force them to take into account the externalities caused by their potential failure), and strengthens incentives to shift certain activities outside the regulatory perimeter, but linked to the banking sector. This shadow banking segment of the financial system is posing potential future financial fragility risk. The problem for regulators is that it is a moving target. As banks innovate for regulatory arbitrage purposes and to reduce regulatory costs, regulators play catch up, a process Ed Kane (1977) refers to as regulatory dialectic. Compared to financial market participants, regulators are at a disadvantage, as regulation (especially rule-based regulation) refers to specific institutions, products and markets. Creating an arbitrage-safe regulatory framework will be a challenge for many years to come (Beck, Carletti, Goldstein, 2015)

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A Greenhouse for Market Discipline: Making Bail-In Work[11]

by Jan Pieter Krahnen[12] and Laura Moretti[13]

1. Introduction

This essay concentrates on market discipline. We claim that the disciplining role of market pricing has been largely overlooked when constructing the tools and rules that constitute the banking union project. "Overlooking" market discipline does not mean that it has no role to play in the regulatory framework. To the contrary, the disciplining power of markets actually plays the leading part in the script of the banking union project. This leading part is epitomized by the key role of banks' total loss absorbing capacity, or TLAC, in the regulatory toolbox. Based on the near-universal bailout experience in the crisis years 2007-2012, the new regulatory regime emphasizes the liability of shareholders and junior bondholders. The first losses experienced by any single banking institution are to be borne by them, by the holders of equity and junior debt. The need for funding under tightened private liability conditions

11. This paper has been prepared for the "Capital requirements and Loss Absorption Capacity for Large Banks" Round Table at Bruegel, Bruxelles (held on July 7, 2015), on the occasion of the launch of the Journal "European Economy – Banks, Regulation, and the Real Sector". We are grateful to Cambridge University Press for their permission to use extracts of our contribution to the volume "Financial Regulation: A Transatlantic Perspective", edited by Ester Faia, Andreas Hackethal, Michalis Haliassos and Katja Langenbucher, to appear in August 2015. In particular, Section II is an abridged version of parts of the book chapter entitled "Bail-in Clauses". We would like to thank Margit Vanberg for helpful comments on an earlier draft of the paper. The views expressed in this paper are those of the authors and do not necessarily represent the views of the Central Bank of Ireland or the European System of Central Banks.
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13. Central Bank of Ireland

will, or so it is hoped, render the issue conditions of these instruments more responsive to the true risks faced by the bank's business model. This is all in theory. In practice, however, limiting systemic risk and minimizing the occurrence of bailout events is difficult to achieve.

The present text will explain why market discipline is so difficult to achieve, and what can be done to strengthen its role in the decision process. In contrast to most other corporate markets in the economy, banks are faced with rather weak disciplining forces from funding markets.

As a remedy, private bank funding markets need to be fostered and nurtured with great care, in order to ensure the viability of market discipline. In section 2, the paper outlines basic conditions for bail-in to be effective. In Section 3, we compare different entry-point approaches to resolution, and their possible effect on bail-in, in a world with mandatory separation of banking activities. Our major policy conclusion defines a new standard for supervisors: the commitment to monitor (and enforce, if needed) benign 'greenhouse' conditions for bank bail-in.

2. The greenhouse conditions: desirable features of the bail-in tool

Despite some shortcomings, the adoption of the Bank Recovery and Resolution Directive (BRRD) for all European member states and the creation of banking union for the Eurozone, with the establishment of a Single Supervisory Mechanism (SSM) and a Single Resolution Mechanism (SRM), are significant steps forward in the prevention and management of future financial crises.

The BRRD, approved by the European Parliament in 2014, establishes a single framework for the resolution of financial institutions that are "failing or likely to fail".[14] In particular, it grants the resolution authorities various powers, most importantly the possibility to inflict losses on shareholders and bondholders, according to a defined hierarchy, using the "bail-in" tool. While the BRRD introduces a unified framework for the entire EU, the euro zone members established a banking union with the creation of the SSM and the SRM.[15]

14. The deadline for the transposition of BRRD into national law was 31 December 2014. However, at the end of May 2015, Bulgaria, the Czech Republic, France, Italy, Lithuania, Luxembourg, the Netherlands, Malta, Poland, Romania and Sweden have failed to implement it into their national law.
15. Please refer to Krahnen and Moretti (2015) for a detailed discussion of BRRD, SSM and SRM.

In the following section, we will discuss three design elements of market-friendly bail-in instruments: conversion (rather than write-downs), trigger (exogenous or not), and loss absorptive ability (managed or not).

a. Market-friendly bail-in design I: conversion

Before even discussing the design features of bail-in tools, it is crucial that these instruments are perceived as *market-friendly*, i.e. clear and easy to price. In fact, the more complex and opaque a product is, the more it becomes difficult to price, and the less liquid the market will become.[16]

There is more than one way to implement bail-in: by writing down face value of debt, or by converting debt into equity. In the first case, the regulator depreciates the face value of equity, mezzanine instruments (hybrid, or Tier 2 capital), subordinate and uncollateralized liabilities to the extent required by the capital shortfall, respecting the seniority structure of the liabilities. In the second case, the regulator converts existing debt instruments into equity, generally respecting the waterfall principle, but this may entail limited or unlimited dilution. In the case of unlimited dilution, like in the case of write-downs, conversion of a senior claim happens only after all junior claims have been fully diluted, with zero option value retained by junior claim holders. In contrast, with limited dilution, sequential conversion of more and more senior claims will lead to progressively stronger dilution rates, and even the most junior claimholder will retain a positive option value.

In the presence of uncertainty regarding the 'right' moment to trigger the bail-in (which is very likely the case), a bail-in strategy is superior if it generates some risk sharing between old and new residual claimholders of the firm (bank). Therefore, conversions with limited dilution are preferable.

In financial markets, debt instruments with pre-arranged conditional conversion clauses are known under the name CoCos, i.e. contingent convertible debt instruments, and they have been discussed extensively in the literature.[17] As pointed out by the Liikanen Commission[18], these instruments can be successful only if there is enough demand by the private sector and a liquid mar-

16. There is a growing literature on the effects of ambiguity (in the sense of not knowing the probability distribution of a particular asset) on its perceived value by investors. The literature shows that on average, the value of the asset decreases with the level of ambiguity, intransparency, and risk endogeneity.
17. See Flannery (2005), Flannery (2009), and Squam Lake Group (2009) among others.
18. See European Commission (2012b).

ket has developed. As described in Murphy et al. (2012), this requires transparency about the trigger and the conversion, tractability (i.e. ease of modelling, pricing and risk managing), and liquidity of the instruments. However, there might be limitations for potential investors due to mandates that preclude investment in equities.

b. Market friendly bail-in design II: triggers

Earlier proposals for bail-in suggest the use of a trigger based on accounting measures (the Squam Lake Group (2009), D'Souza et al. (2009) and Glasserman and Nouri (2012)).[19] However, others (Flannery (2005 and 2009), Hart and Zingales (2011), Calomiris and Herring (2011) and McDonald (2011)) propose the use of market-based indicators since accounting measures are subject to manipulation, suffer from a time lag, and because they failed to provide any warning signals prior to the onset of the recent financial crisis.[20] Martynova and Perotti (2012) show the existence of a trade-off between choosing a market trigger, which produces more conversions, some unnecessary (type II error), and a book value trigger subject to supervisory discretion, which converts too infrequently (type I error) and it thus subject to regulatory forbearance.

Though a market-based trigger[21] is more transparent than one based on accounting measures, it might lead to multiplicity or absence of equilibria.[22] From a practical standpoint, market-based triggers can work only for listed banks, as pointed out in Berg and Kaserer (2014) and Acharya and Steffen (2014). This is by no means a minor concern – even for systemically important institutions – since only 41 of the 124 banks subject to SSM supervision in the Euro area are actually publicly listed.

A last point related to trigger design is the exogenous or endogenous character of the trigger event. Sundaresan and Wang (2011) argue that the regulator would be subject to political pressure and may therefore be reluctant to

19. In particular, D'Souza et al. (2009) suggest the use of the U.S. stress test.
20. See Sundares and Wang (2011) for an extensive discussion on the choice of the choice of security on which to place the market trigger.
21. See Hart and Zingales (2011) and Calomiris and Herring (2011) among others.
22. Multiple equilibria incur also in Sundaresan and Wang (2011) and Abdul et al. (2010), while in Pennacchi (2010) a closed form solution is ensured if the trigger relates to the asset-to-deposit ratio.

declare a crisis to be systemic, being wary of false alarms.[23] Moreover, including an element of discretion would increase uncertainty and introduce an element of opacity to the trigger. Berg and Kaserer (2014) survey the recent issuing of CoCo-bonds of European banks and find that observed triggers are based on regulatory ratios, with the ratio between Core Tier 1 capital and Risk Weighted Assets (CT1/RWA-ratio) being the most frequently used trigger.

c. Market-friendly bail-in design III: access restrictions

The credibility of bail-in announcement depends not only on the letter of the law, but also on the deeds of the supervisory authority. In fact, as has been observed many times during the crisis years since 2007, even if the regulator has the intention to implement bail-in, the fear of creating a systemic risk event may prevent imposing losses on bondholders and lead back to the implementation of classical bailout policies.[24] Since market participants learn over time, they will anticipate more bailouts to come, should any systemically important bank be on the brink of failure.[25]

The most obvious reason why a potential bail-in may not be executed in a crisis is the presence of interbank holdings of such subordinate debt. As a response, regulators may insist on not allowing banks to invest in other banks' subordinate debt.[26] Conversely, an ideal investor in bank subordinate (bail-in able) debt is an institutional investor, pursuing a long-long strategy, i.e., long-term investments funded by long-term deposits[27], such as pension funds, life insurance companies, and private equity funds.

However, a holding restriction for banks is not a sufficient condition for bail-in credibility. Also the confidence that the actual holder of the claim can weather a potential loss in asset value (caused by a bail-in) is crucial. For example, a life insurance company holding high return bail-in debt, should build

23. The reputational cost could be very serious in the case of coincidence of supervisory and monetary policy authority as in the Eurozone and in the UK.
24. See Duebel (2013) for a collection of bailout case studies for the years 2008-2011.
25. See Schweikart and Tsesmelidakis (2013) for an empirical evidence based on price of creditor protection showing that markets firmly believed in bailouts to happen.
26. This has first been suggested as a structural regulatory measure for bank soundness by the Liikanen report in 2012, see European Commission 2012b.
27. Long-long investment companies do not face liquidity funding risk since they do not allow (or disincentivize) investors to withdraw their funds at short notice.

up buffers in good times that mitigate excessive balance sheet damage in a potential bail-in. Such buffers can be built up from the coupon payments.[28]

d. Market-friendly bail-in design IV: the role of the supervisor

A final point in designing an environment in which government bailouts of banks are only extreme exceptions, and the bail-in of bank creditors is the norm, relates to the key role of the supervisor. These authorities are expected to monitor the state of the bail-in *ability* of banks' subordinate creditors. If bail-in ability is met, then subordinate debt can be priced correctly, largely eliminating the implied funding subsidy inherent in an implicit government bailout guarantee. The supervisor may need to develop the necessary tools required for monitoring bail-in ability.

Examples of additions to the supervisory task list are: monitoring access restrictions and the identity of bail-in debt investors, including risk re-transfers via CDS markets; monitoring loss absorptive ability for bail-in debt investors, including the build-up of sufficiently large loss buffers; monitoring the liquidity of markets for subordinate bank debt instruments.

As a final point, we want to mention the possible integration of bail-in monitoring (the role of the supervisor), bail-in execution (the role of resolution agency), liquidation and resolution (the role national resolution agencies, like FMSA in Germany), and deposit insurance (the role of national deposit insurances and international resolution funds) into a single institution. Such a deposit-and-resolution insurance agency could be modelled after the FDIC (Federal Deposit Insurance Corporation) in the US market.[29]

28. Note that bail-in debt coupons are expected to be relatively elevated, because of the relatively high default risk they carry, coupled with a high expected loss given default. For example, the junior (CoCo) bonds issued by Swiss banks in 2013 offered an expected return several hundred basis points above that of senior bonds of the same issuer. The coupon, therefore, reflects not only a risk premium but also a loss expectation. The latter should not lead to distributions to shareholder, unless a sufficiently large loss provisioning has been booked in the annual accounts.
29. This is not the place to go into any detail for a proposed deposit-and-resolution insurance agency, but we expect significant synergies to emerge.

3. Structural reform and bail-in: implications for an adequate point of entry

In the previous section, we have discussed the master conditions for bail-in credibility. These are desirable features of TLAC debt instruments that are potentially subject to a bail-in. Preventive monitoring by a concerned supervisory agency is called for. The fact that no supervisor today has added the surveillance of these master conditions to its list of duties may be seen as an alarming sign of unawareness.

Besides bail-in credibility, there is another, and closely related, item on the reform agenda that merits attention: structural reforms, as suggested by the Vickers Commission for the UK in 2011 and by the Liikanen Commission for the EU in 2012. Both proposals aim at limiting the too-big-to-fail phenomenon by facilitating the resolution of large banks. While the UK has opted for ring-fencing the national deposit and lending business of banks (retail and commercial banking), the EU is currently discussing a separation (ring-fencing) of proprietary trading from the rest of banking activities, thereby keeping any potential government guarantee away from a bank's trading on its own account.[30]

While the question of whether to draw the line between prop trading and the rest of the bank, or between all trading activity, beyond some threshold value, and the rest of the bank is hotly debated among bankers in the EU, the resulting outcome will be characterized by a separation of the classical, universal banking activities into two parts, a trading bank and a commercial and investment bank. In the currently favoured version, all prop trading will either be forbidden outright, as already implemented in Germany and France, or it has to be delegated to a subsidiary institution, the trading bank. In the latter case, the question arises how separation interacts with the new bail-in regime.

Bail-in is indeed affected by a structural separation requirement, as the chosen organizational set-up of the bank is relevant here. To see this, we need

30. The original proposal by the Liikanen Commission (see European Commission, 2012b) recommended against a separate treatment of prop trading on the grounds that it cannot seriously be told from hedging and market making. The resulting type-I and type-II errors are expected to be excessively high (Krahnen et al., 2015), rendering the separation of prop trading an inferior policy option. The Liikanen Commission proposed to separate all trading activities, including market making, beyond a threshold size of the trading book.

to distinguish between two types of organizational set-ups, a parent unit and its subsidiary unit(s). The top of the organizational pyramid, the parent, may be a non-operative (a holding company, or Holdco), or an operative company (Opco), issuing equity and debt to investors in capital markets.

Holdco assets consist of equity of its operational subsidiaries. The liabilities of the subsidiaries, in turn, consist of the debt issued to outside investors, plus the equity held by the Holdco. Holdco debt is junior to debt issued at the subsidiary level. Such a setup is commonly found among big international banks in the US, UK, CH, Japan.

The Opco design is typically found in continental Europe (F, GER, E, I). The Opco parent may have a number of equally operative subsidiaries. One difference between Holdco and Opco structures relates to debt seniority. Senior unsecured debt issued by the Holdco is structurally subordinate to any debt issued by its subsidiaries, or the parent company. For Opco structures, in contrast, all unsecured debt issued by the subordinate firms has the same level of seniority (i.e., is pari-passu).

The Holdco structure is ideally suited to implement a single point of entry (SPE) concept. SPE refers to the Holdco being the relevant balance sheet for all bail-in activities. No matter where the Opcos are being run, losses at their level are channelled to the holding level, meaning a write down of the former's equity. The Holdco then settles with its shareholders (wiping out equity in this example), and with its debt-holders (reducing TLAC debt position). Based on this scenario, SPE is widely believed to be the best way to implement a bail-in regime today. In a recent paper, Gordon and Runge (2015) review the US experience and recommend the implementation of the SPE model in Europe as well.

The important point is that, because of the subsidiary debt seniority, any loss exceeding subsidiary equity will be covered by Holdco's TLAC debt position. The latter thus serves as a mutual capital account potentially covering losses occurring at any subsidiary.

No such joint liability exists in the case of MPE set-up. If losses at the subsidiary level exceed its own equity, then subsidiary debt is bailed-in. For the parent firm, losses are limited by the total value of the equity held in the subsidiary.

Different loss allocations have implication for the credibility of the bail-in tool. To see this, recall that structural reforms (as laid down, for instance, in

the draft law published by the European Commission in January 2014) are intended to separate particularly risky lines of business, like trading activities on a bank's own account, from normal banking activities deemed less risky, like advisory services, deposit taking, lending to small and medium sized firms, and running the payment system. Separation is intended to fence normal banking activities, for which implicitly (and partially) a government guarantee has been extended, from those activities that should not benefit from such an implicit guarantee. However, under an SPE-regime, significant losses in the proprietary trading book would be channelled upwards, to the Holdco capital accounts.

Assuming the Holdco has limited access to additional funding during a crisis of an individual bank, the loss event experienced at the subsidiary level will carry over to other subsidiaries (or Opcos) under the same Holdco roof. This may happen because the Holdco will have to shrink its assets if it can't raise new equity, engaging e.g. in fire sales. If the loss spillover is significant enough, the entire bank may be in trouble.

Disregarding reputational risk, a same-sized shock under an alternative MPE design will not sink the entire banking firm, as there is no room for loss spillovers among parent and subsidiaries, due to fencing. As a consequence, the MPE model will allocate subsidiary losses that exceed its own capital to its own debt holders, rather than to the Holdco. For this reason, the parent and each subsidiary need to establish a proper bail-in able debt structure, in line with the TLAC requirements.[31]

Therefore, in an SPE world (but not in an MPE world), a fencing of losses against spillovers to parent firms or to other financial institutions requires an MPE approach, implying a ban on internal TLAC, or on synthetic risk mutualization among subsidiaries of the same Holdco.

That said, there are several caveats to consider. First, under the usual assumption of less than perfect return correlation across subsidiaries, the sum of TLAC capital a company with several subsidiaries has to hold in an MPE model exceeds the TLAC capital to be held in an otherwise identical SPE model. The reduced capital requirement in an SPE reflects the insurance effect

31. Fernandez e Lis (2015, this volume) has a related argument in favor of a MPE model, emphasizing the operational resolution problems faced by a bank with subsidiaries in different jurisdictions around the globe.

among a portfolio of firms with less-than-perfectly correlated loss events. Second, in the MPE model, TLAC is allocated at the subsidiary level. As a consequence, funding costs may differ across subsidiaries in the same holding, reflecting stand-alone risk that can be attributed of these subsidiaries.[32]

Thirdly, and perhaps most profoundly, the adoption of an MPE approach is seen by some as a fragmentation of the financial system within the European Union or the Euro area. This argument is particularly valid if the formation of bank subsidiaries is primarily along national boundaries rather than functional activities. Therefore, at first sight, MPE seems to encourage a national approach to resolution, and a fragmentation of the banking market in Europe. However, the emerging role of Europe-wide standards for resolution and TLAC management and implementation via Euro area institutions (SSM, SRM) work in the exact opposite direction. The overall effect will hinge upon the extent to which European standards of supervision will effectively override national concerns.

4. Conclusion

In the previous sections, we have described the potential role of a properly designed bail-in debt market for improving welfare in financial markets. This market's primary role is to repair bank risk taking incentives in the direction of improved downside risk consideration.[33] We stress the term market discipline here, in the sense of pricing default risk on the primary market, revealing relevant information on a secondary market, and more generally encouraging debt holders to voice concerns, or to become active in the governance system of banks.

The role of the supervisor in this picture is that of a guard who enforces the rules of the game. She is *not* attempting to be a better risk manager at the level of individual banks than the banks' management teams. Thus, the supervisor will not micro-manage a bank's risk management, nor will she greatly be con-

32. Funding cost differentials among subsidiaries of the same (banking) firm are not necessarily a bad thing; it could actually be a desired outcome of a separation, if incentive considerations in bank risk taking are relevant, as outlined. in Krahnen (201-3- explaining Liikanen).
33. Even if everything is in place as suggested in this paper, there is the issue of basic (or exogenous) systemic risk in the financial industry. Monitoring systemic risk, and curtailing its extent, its growth, and its possible consequences remains a major additional challenge for the supervisor and the central bank – this issue is beyond the scope of this paper.

cerned with its business model. Instead, the supervisor focuses attention on the quality and quantity of the bank's TLAC position: the credibility of a future bail-in needs to be actively designed and monitored. While bail-in as a possibility is a simple consequence of a legal decree (as in the BRRD or the Dodd-Frank Act), it is not automatically credible, i.e. rationally expected by market participants to be put into effect when needed, unless adequate provisions are in place.

We have discussed such adequate provisions relating to the design of bail-in instruments, in order to make them attractive for investors and to encourage the development of secondary markets.

In all these design features, the role of the supervisor has to be (re-)considered: its main operative objective, in our opinion, should be *to ensure bail-in ability at all times*.

In particular, the banking supervisor, in conjunction with the agency responsible for the SRM-process, will need a clear mandate for checking, on a regular basis, that banks are sufficiently staffed with loss absorbing capital. That is: equity *and* bail-in debt. For both types of loss absorbing capital, the supervisor has to ensure at any time that a necessary bail-in can actually be carried out without the fear of systemic risk repercussions. This requires thorough knowledge of the whereabouts of the equity and bail-in debt positions, i.e. which investor is long in these assets, whether they are located inside or outside the banking system, and whether there is any prospect of re-transfer of risk into the banking system via CDS or other forms of insurance. Furthermore, are those particular investors subject to run risk?

Moreover, a proper bail-in mechanism will be affected by a structural reform of bank business models. In particular, if a separation of banking and (proprietary) trading is sought, then the adoption of a multiple point of entry-model of resolution practice is a consistent solution. A single point of entry-model (SPE), in contrast, will undo the separation in a default situation, and it will therefore also not be credible before a default event.

We conclude by offering an explanation for the term "greenhouse conditions" in the title of this essay. Market discipline, which is widely believed to be a forceful instrument of self-control in a market economy, is apparently dysfunctional in the banking industry, due to the latency of systemic risk and the externality thus created. As a consequence, a reasonable regulator-supervisor is an institution builder. The institution-of-choice is the market for junior

bank debt, or TLAC debt. If the debt market functions efficiently, it will send price signals to management and shareholders of banks, and it will not be distorted by bailout expectation. However, if left unattended, the same junior bank debt market will attract implicit government guarantees, and this be crippled as a market institution.

The term greenhouse refers to the highly artificial nature of such a well-oiled market institution. In this picture, the supervisor will become the gardener whose main role is to nurture the functional conditions of the market as an institution. Today, we are still quite some distance away from a greenhouse market institution. Worse, the regulator-supervisor has not even begun to realize the importance of its new role as a gardener of bank bail-in ability.

As a litmus test of bail-in credibility in Europe, we should expect bail-in to happen once in a while, with the government apparently respecting the rules of the game and thus *not* interfering in a proper bank default and resolution event. If this happens, we should cheer the supervisor, not blame her.

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Questions & Answers

In this section four contributors address questions raised by the editors. The first three contributions Gracie, Clerq and Salleo) discuss how capital and loss absorption requirements affect financial stability and banks'assets allocation. The fourth contribution (Fernandez de Lis) looks at the relationship between TLAC rules and banking organisational models.

TLAC and financial stability

by Andrew Gracie[34]

Q: Are capital requirements for G SIBs an effective way of reducing systemic risk?

A: Higher capital requirements are necessary, but not sufficient, to reduce systemic risk.

Since the financial crisis banks have been required to hold significantly higher levels of capital to protect against the risk of firm failure. Minimum capital requirements have been increased and global systemically important banks (G-SIBs) are generally required to hold a higher proportion of capital than other firms. Firms must not only hold more capital than before, they are also required to hold a higher quality of capital. A larger proportion of bank capital must be made up of common equity and some instruments that previously contributed towards capital are being phased out. The consequence of this is that banks are more resilient; they are better able to withstand stress and less likely to fail than they were in the past.

The revised capital framework also addresses risks to the system as a whole: the requirement for a countercyclical buffer seeks to guard against the cyclical build-up of risk and means that banks may be required to hold additional capital specifically for the purpose of reducing systemic risk. This is overseen by dedicated macroprudential authorities. In the UK, for example, the Financial Policy Committee is explicitly charged with identifying, moni-

34. Bank of England

toring and taking action to remove or reduce systemic risks and it can direct the regulator to adjust specific marcoprudential tools for this purpose.

Moreover the planned introduction in the UK of a non-risk-based leverage ratio framework as a complement to the risk-weighted capital framework, including the application of leverage ratio buffers for systemically important firms and a countercyclical leverage ratio buffer, will, when implemented, enhance the robustness of the overall capital framework.

In addition to enhanced capital requirements banks, as well as other financial firms, are expected to be better run. They must meet higher standards of governance and individuals are being held accountable for their decisions and actions to a much greater extent than was previously the case.

These reforms represent significant progress and we should not underestimate the scale of what has been achieved. There has been a substantial amount of international work, not least through the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS) and the European process to achieve a consensus on some fundamental and often difficult changes to the regulatory framework and this has taken persistence and determination. Individual countries have worked equally hard to implement – and in some cases build on and refine – international standards and rules in their domestic regimes.

Individual firms are demonstrably less likely to fail than they were in the past and authorities now have explicit mandates to address risks arising in the system as a whole as well as vulnerabilities in individual banks.

Nevertheless banks should be allowed to, and will continue to, fail. The international standard setters have acknowledged this and the UK goes as far as to be explicit that it does not run a zero-failure regulatory regime[35]. It is accepted that banks will continue to fail from time to time and this is generally considered an ordinary and desirable feature of a market economy in which there is a healthy competition for business.

Rather than avoiding failure altogether the goal is that, if a firm does fail, it should do so in an orderly fashion: without excessive disruption to the financial system, without avoidable interruption to the critical economic functions that

35. http://www.bankofengland.co.uk/publications/Documents/praapproach/bankingappr1406.pdf

it provides and while ensuring that losses arising from failure are borne by the shareholders and creditors of the failed firm rather than the general public.

Achieving this will contribute to financial stability - the widespread disruption that characterised the crisis in 2007/8 will be avoided. Moreover, if it is feasible and credible that a firm can be resolved, the implicit state guarantee from which the largest banks have benefited in the past will be removed. Risk will be appropriately priced and market discipline improved, further reducing the probability of a crisis. Finally, orderly resolution can ensure that firms with inefficient or obsolete business models can exit the market and can make room for more efficient new challengers.

It is therefore vital that authorities have effective resolution regimes – and the FSB has set out the parameters for these in its Key Attributes[36]. In Europe the Bank Recovery Resolution Directive, which is now in force and is being implemented across the EU, ensures that all Member States have appropriate tools and legal frameworks to deal with weak and failed banks.

What this means in relation to capital is that we need to focus not only on going concern regulatory capital requirements aimed at avoiding failure but also on requirements for gone concern loss absorbency – that is requirements for liabilities that can credibly and feasibly be used to absorb losses and recapitalise an institution in a resolution. G-SIBs in particular must have sufficient total loss absorbing capacity – both going and gone concern capital – so as to be able to absorb losses prior to a failure, and to enable the authorities to effect a resolution following a failure. Although there are a number of resolution tools available, the most likely approach for a G-SIB and other large banks is the application of the bail-in tool, where losses are absorbed by liabilities that are written down or converted into equity but the firm, or a successor entity, remains open for business. Authorities would convert a sufficient amount of liabilities into equity to ensure that the firms can continue to meet solvency requirements and maintain market confidence. This means that the firm must have the capacity not only to absorb pre-resolution losses, but also to meet recapitalisation needs. Following this initial stabilisation phase the G-SIB would be restructured and/or wound down in an orderly fashion.

36. http://www.financialstabilityboard.org/2014/10/r_141015/.pdf

To this end, the FSB has agreed in broad terms, and is in the process of finalising, a common international minimum standard for total loss absorbing capacity (TLAC) for G-SIBs. In Europe the equivalent standard is a minimum requirement for own funds and eligible liabilities (MREL), which applies to all banks and not just to G-SIBs. However both standards essentially aim to achieve the same thing and the expectation is that in Europe TLAC for GSIBs will be given effect through MREL. MREL will be set on a firm-by-firm basis and can be set in a way that is consistent with the global minimum requirement for G-SIBs.

Q: What is TLAC?

A: TLAC is the FSB's proposal for a common international minimum standard for total loss absorbing capacity for G-SIBs.

The FSB TLAC proposal is publicly available[37] – indeed the FSB have actively sought views on it through an open consultation process – but it is worth recalling the basic principles that underpin it.

First: firms must have sufficient loss absorbing and recapitalisation capacity available in resolution to allow resolution authorities to effect an orderly resolution and recapitalise the firm. An orderly resolution is one that minimises the impact on financial stability, ensures the continuity of critical functions that the firm provides and avoids exposing taxpayers to loss. It needs to be credible – to a high degree of confidence – that this can be achieved.

Second: resolution authorities should determine a firm-specific Minimum TLAC requirement for each G-SIB that: a) is at least equal to a common Pillar 1 TLAC floor agreed by the FSB (see below); b) makes prudent assumptions about losses incurred prior to resolution and realised during the prudent valuation that informs resolution actions and c) ensures that the entity (or entities) emerging from resolution will meet conditions for authorisation – including any consolidated capital requirements – and will be sufficiently well capitalised to command market confidence.

Third: given that G-SIBs operate in multiple jurisdictions, and to avoid disruptive fragmentation in the event of failure and facilitate cooperation between home and host authorities, host authorities must have confidence that there is sufficient loss absorbing and recapitalisation capacity available to

37. http://www.financialstabilityboard.org/wp-content/uploads/TLAC-Condoc-6-Nov-2014-FINAL.pdf.pdf

subsidiaries in their jurisdictions with legal certainty about how losses and loss absorption will be allocated within a group at the point of resolution.

FOURTH: exposing TLAC-eligible instruments to loss should not give rise to systemic risk or disruption to the provision of critical functions. In particular authorities should place appropriate prudential restrictions on G-SIBs' and other internationally active banks' holdings of liabilities eligible to meet the TLAC requirement.

FIFTH: liabilities that qualify as TLAC should be stable, long term debt claims that cannot be called at short or no notice, or equity capital. This is necessary in order to provide comfort that TLAC liabilities will be available at the point of resolution.

SIXTH: a breach or likely breach of TLAC should be treated as severely as a breach or likely breach of minimum capital requirements and addressed swiftly, again to ensure that sufficient loss absorbing capacity is available in resolution. However regulatory capital buffers must be usable without entry into resolution.

SEVENTH: There must be clarity – to holders of TLAC and more broadly – about the order in which losses will be absorbed in resolution, which should be aligned with the insolvency creditor hierarchy. This is also necessary to ensure that exposing TLAC-eligible instruments is legally enforceable and does not give rise to valid compensation claims.

Q: What does this mean that G-SIBs will have to do?

A: The proposed FSB standard sets out requirements in relation to the quantity and quality of TLAC that G-SIBs must hold, as well as in relation to the distribution of TLAC within a group and the disclosure of TLAC holdings.

QUANTITY: TLAC will be calibrated as the higher of between 16% and 20% of risk-weighted assets or twice any Basel leverage requirement. Existing Basel capital buffers continue to apply – they 'sit on top' of TLAC so that they remain usable. This means that banks that experience losses would initially only breach buffer requirements, which is associated with limited but well-defined consequences. Including buffers G-SIBs will, under the current proposal, therefore have to hold TLAC equivalent to 19.5% - 25% of RWAs. The TLAC standard is a Pillar 1 minimum requirement but authorities can continue to set additional firm specific requirements.

Quality and composition: The TLAC requirement can be satisfied by all regulatory capital instruments, as well as unsecured and uninsured liabilities with a residual maturity of more than one year that are readily loss-absorbing in resolution. In order for debt liabilities to count towards TLAC they must be within the scope of statutory bail-in tools and be capable of being readily converted into equity. This means that they must be subordinated to liabilities that are explicitly excluded from TLAC or bail-in (see below on subordination). The key here is that TLAC must be easily usable in resolution in a manner which supports the principles outlined above.

Distribution and internal TLAC: How TLAC is distributed around a group will depend on how the group would be resolved. However, losses may arise in different parts of the group, financial resources are not fungible in resolution and, ex-post, the group may not have incentives to voluntarily recapitalise a failed subsidiary. While TLAC would only be issued externally form the legal entity that would formally enter resolution, losses may arise elsewhere in the group. The TLAC standard requires banks to maintain 'internal TLAC' – certain intra-group liabilities – that allow losses to be passed to the 'resolution entity' from wherever they arise. This provides a pre-defined way to channel losses to the resolution entity and provides host supervisors with confidence that losses arising in their jurisdictions will be absorbed. It also provides clarity on the creditor hierarchy and ensures that a complex group does not have to be resolved on an entity-by-entity basis.

The FSB proposal requires G-SIBs to pre-position TLAC on the balance sheet of all material subsidiaries to ensure that losses can be absorbed by the legal entity that would be put into resolution. The amount required to be pre-positioned is 75-90% of the TLAC requirement that would be applicable to the material subsidiary if it were itself a resolution entity.

Disclosure: G-SIBs must disclose, at legal entity level, a) the amount, maturity and composition of TLAC maintained by each resolution entity and at each material subsidiary and b) the liabilities of each resolution entity that are *pari passu* or junior to TLAC – that is liabilities that sit at the same level as, or below, TLAC liabilities in the creditor hierarchy.

Disclosure of the creditor hierarchy for each legal entity allows investors to better assess the risks to which they are exposed by providing clarity on the order in which losses will be allocated both at the legal entity level and

within the group. This should reduce uncertainty enhance market discipline and minimise the shock caused by any surprises in a bail-in.

SUBORDINATION: TLAC liabilities must be subordinated to liabilities that are *excluded* from TLAC, on which it may not be possible to readily impose losses in resolution. This means that TLAC liabilities will be exposed to loss before liabilities that are excluded from TLAC. The aim here is to avoid having to depart from the insolvency creditor hierarchy in resolution, which may give rise to legal risks and valid compensation claims on the grounds that resolution would treat some creditors worse than an insolvency would (we refer to this as the '*No Creditor Worse Off than in Insolvency*' safeguard).

TLAC does not need to be subordinated to liabilities that are ineligible for – but not excluded from –TLAC, for example liabilities that do not meet the maturity requirement. This means that ineligible liabilities may be exposed to loss before, at the same time, or after TLAC liabilities – depending on where they fall in the creditor hierarchy.

Subordination increases clarity on the order in which losses will be allocated in resolution. But it is important to be crystal clear: liabilities that do not count towards TLAC – either because they are explicitly excluded, or because they are ineligible to count, may still be exposed to loss in accordance with the creditor hierarchy.

There are three routes to subordination:

i. CONTRACTUAL: subordination is specified in the terms of the TLAC liability's contract. This is relatively straightforward to arrange and can be done by the parties to the contract, without intervention from public authorities.
ii. STATUTORY: subordination is specified in law. This requires national governments to set out the terms of the subordination, and the liabilities to which it applies, in law. The EU Bank Recovery and Resolution Directive, for example, specifies that deposits covered by EU deposit guarantee schemes are 'super-preferred' in the creditor hierarchy. Similarly, for the purpose of TLAC, individual governments could specify that certain liabilities are generally subordinated to others, for example operating liabilities.
iii. STRUCTURAL: subordination is achieved through the structure of the bank. For example, TLAC liabilities issued by a 'clean' holding company or intermediate holding company (that is, does not have operational ac-

tivities and does not issue liabilities that are excluded from TLAC) will be subordinated. In a resolution losses will flow up to the holding company and be absorbed by the liabilities issued from it. This is perhaps the most straightforward form of subordination in the long term but may take some time to achieve and can involve substantial and complex changes to how firms are organised.

Subordination can therefore be achieved in a variety of ways. The method used is less important than the end objective and may change over time.

Q: How, in practical terms, does TLAC relate to the resolution of a G-SIB?

A: TLAC makes it feasible and credible to resolve a G-SIB.

The FSB TLAC agreement will provide the parameters within which TLAC is set. But it is important to remember that the authorities' resolution plan for the firm will drive the detail. That said, bail-in is the only feasible resolution option for a G-SIB. It is not credible to think that a G-SIB could be dismantled over a resolution weekend without a destabilising disruption to critical functions. Finding a private sector purchaser capable of taking on the business – in whole or in parts – is likely to be even more difficult.

There is more than one way to effect a bail-in but, however it is applied, the bail in tool allows the losses of a failed firm to be absorbed and the firm (or its successor) to be recapitalised by writing down and/or converting into equity the claims of shareholders and uninsured and unsecured creditors in a manner that respects the hierarchy of claims in insolvency.

Effectively bail-in protects a firm's critical functions. It buys the time to stabilise the firm before an orderly reorganisation which may include winding down or selling parts of the failing firm. The orderly reorganisation point is important and the FSB is explicit that the underlying causes of the firm's failure must be addressed.

Moreover it is not enough simply to absorb losses and recapitalise the failed firm – the firm must be a recapitalised to a level that ensures that the firm complies with post-resolution conditions for authorisation and sustains market confidence. One proxy for market confidence is access to market funding – but of course it is difficult to say with certainty what level of recapitalisation needs to be achieved before market funding is available.

The proposed TLAC framework makes it feasible and credible to conduct a bail-in on a G-SIB. It ensures that firms have sufficient loss absorbing and recapitalisation capacity beyond going concern capital requirements available in the right place and in the right form at the point of resolution. The proposed framework also ensures that TLAC is usable, both legally and practically.

Of course the process for setting TLAC is one part – though an essential part – of the resolution planning and resolvability assessment process which – as its name suggests – considers firm resolution and resolvability in its entirety, including:

i. the options available for reorganising the firm's critical functions in resolution and whether they are to continue within the firm, to be transferred elsewhere in the market or to be wound down;
ii. whether the firm should make ex ante changes to the way they are organised so as to remove impediments to resolution and guarantee that options to separate critical functions in resolution are credible.

Decisions on these wider resolvability issues sit alongside the TLAC framework and allow resolution authorities to ensure that the loss absorption and recapitalisation resources that a firm holds align with the resolution strategy for preserving its critical functions. The authorities will specify not only how much TLAC firms must hold, but also where it should be held within an inevitably complex group, and the form in which it must be held. The process involves significant cooperation between the home and host authorities which have a shared interest in planning for the resolution of the firm and significant dialogue with the firm itself.

Q: What are the costs and benefits of TLAC and are criticisms of TLAC justified?

A: The FSB is currently looking at the projected costs and benefits of TLAC, and the results of this will inform the final TLAC standard, but the outlook is promising.

It is no surprise that there has been a vigorous debate about the costs and consequences of TLAC. It marks a major change in the regulatory framework and brings firms' liability structures into sharp focus.

It is nonetheless important to answer some of the criticisms that have been levelled at the proposed framework. One is that the TLAC standard implies

that the Basel reforms are inadequate –that it would be more straightforward to increase the Basel capital requirements than to design a new framework. The TLAC standard in fact reinforces and complements the capital requirements agreed by the BCBS in the Basel III package. Basel III requires banks to hold regulatory capital to absorb losses arising from financial and economic stress, whatever the source. TLAC seeks to ensure that G-SIBs can fail, and that in the event of such a failure, firms have sufficient additional loss absorbing capacity, available in the right place and in the right form, to allow the firm or its successor entity to be recapitalised without disruption to the critical economic functions that the firm provides.

A second criticism is that TLAC concentrates risk and that banks will simply hold each other's TLAC eligible liabilities. This is not the case: under rules being finalised, GSIB holdings of other GSIB's TLAC will be deducted from their own TLAC or regulatory capital. This is designed to prevent or discourage other banks from holding TLAC-eligible debt and will limit the contagion effects of imposing losses on TLAC in a resolution. The treatment of TLAC holdings by other banks remains under review by the BCBS.

Critics have also suggested that the prospect of bail-in will lead to a 'buyers' strike' – meaning that there will be a limited uptake of the TLAC-eligible liabilities issued by firms. This view overlooks the benefits of the clarity that the TLAC proposals provide as well as their effects on the pricing of risk. The TLAC framework provides ex ante clarity on the liabilities that will be exposed to loss in resolution, and on the order in which they will be exposed to that loss (i.e. the creditor hierarchy). This in turn ensures that the risk that holders of TLAC liabilities are exposed to is properly priced. And the simple fact is that there is no current evidence to support the notion that there will be a buyers' strike. UK G-SIBs have recently been able to issue TLAC-eligible liabilities at prices that were not materially higher than the price of their existing wholesale funding (see below).

Turning to the costs associated with TLAC, the FSB is currently looking at the projected costs of TLAC in great detail, in advance of the standard being finalised. Early indications from the market suggest that the cost of TLAC will be manageable.

For banks with holding company structures, restructuring existing wholesale debt to become TLAC-eligible (by migrating it to the holding company)

is likely to increase funding spreads by around 50bps, based on current yields. The expectation is that this will have very limited effects on the average cost of credit to the real economy.

For banks that do not have holding company structures, and therefore have to issue contractually subordinated debt, current yields would suggest that the costs may be somewhat higher. However the expectation is that the pricing of existing debt instruments will change as significant new layers of subordinated debt reduce the riskiness of existing senior and subordinated debt. Since the different forms of subordination are economically equivalent, the long-run impact should be comparable to that for banks with holding company structures. That is to say, it should be relatively benign.

Although some observers worry that banks' traditional ability to transform illiquid and risky assets into liquid and safe liabilities (such as demand deposits or short-term wholesale funding) may be affected by the requirement for TLAC, this is not borne out by currently available evidence. In practice most G-SIBs will be able to satisfy the TLAC requirement by restructuring existing long-term wholesale debt to become TLAC-eligible. G-SIBs have significant amounts of non-deposit liabilities that can be converted into TLAC without restricting a bank's ability to engage in maturity transformation.

As for the benefits of TLAC, these are more difficult to quantify since they depend largely on the counterfactual of how a future G-SIB failure would be managed in the absence of TLAC.

However, comparing a bail-in to a bail-out counterfactual (which was the way in which G-SIB failures have been historically handled), there are two key benefits of bail-in.

First, TLAC insulates sovereign balance sheets and ensures that, instead of being absorbed by governments, losses are borne by holders of bank debt. By ensuring banks are more adequately capitalised, and enabling them to fail in an orderly way, TLAC could reduce the economic effect of a crisis.

Moreover, although some critics fear that imposing losses on holders of bank debt may give rise to a bail-in 'shock', existing evidence suggests that the impact of exposing individuals to financial wealth shocks is limited, since holders of financial wealth tend to be able to bear the loss without significant changes to their spending patterns.

Second, and perhaps more important, is that the existence of credible resolution framework, and institution-specific resolution plans which include adequate levels of TLAC, remove the perceived state guarantee from which G-SIBs have previously benefitted and make banks' funding costs more sensitive to risk and therefore appropriately priced.

This reduces riskiness in the system as a whole: there is convincing evidence that perceived government guarantees incentivise banks to take larger risks; when these are removed, and bail-in is credible, risk is more accurately priced. This makes funding risky activities more costly – so fewer are undertaken. It also reduces the probability of failure in individual firms: as outlined above, firms take fewer risks – on an individual as well as an aggregate basis.

So although the cost benefit analysis is not yet complete – and of course the FSB is still finalising its proposed framework – the emerging evidence supports the view that the costs of TLAC will be manageable. Conversely the benefits – of financial stability, of properly priced risk and of freeing up sovereign balance sheets are significant. Requiring firms to hold TLAC represents a major step forward in the effort to solve too big to fail.

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Higher capital requirements for GSIBs: systemic risk vs. lending to the real economy

by Laurent Clerc[38]

Higher capital requirements for GSIBs and Systemic risk:

a. Are capital requirements for GSIBs an effective way of reducing systemic risk in the financial markets?

b. Are there other means to effectively reduce banks' systemic risk (e.g. large recovery and resolution funds, separation of activities etc)

Reducing the "Too-Big-To-Fail" problem has been one of the top priorities on the G20 regulatory reform agenda since the unfolding of the financial crisis. Internationally active banks have become too big, too complex to be effectively managed, and too dangerous for the overall financial system. The size of their balance sheet usually represents a multiple of the GDP of their home jurisdiction and their failure might have dramatic and unbearable consequences for the economy. Higher capital requirements and systemic add-ons or buffers actually reduce the size of the implicit subsidies they are provided with, due to the propensity of governments to bail them out in case of problems, as well as excessive risk taking and moral hazard.

There are however limits to resorting only on capital requirements to prevent or mitigate systemic risk. These limits stem from the fact that too high capital requirements may at some point hurt the economy by raising the total cost of funding. There is an ongoing controversy regarding bank

38. Banque de France

capital requirements. On the one hand, some academics like Admati or Hellewig (2013) or policy makers recommend very high capital ratios of 30%; on the other, some economists like Gorton and Pennacchi (1990) or DeAngelo and Stulz (2013) consider, in line with the main findings of the finance-growth literature, that high leverage is good for banks and is generally accompanied by economic growth. The proviso however is that bank credit effectively goes to the businesses rather than households to finance housing. Otherwise, bank credit might slow rather than boost long-term growth. As an illustration, Cournède and Denk (2015) find that a 10% of GDP increase in the stock of bank credit is associated with a 0.3 percentage point reduction in the long-term growth. Recent evidence suggests that both the negative short run and long run impact of an increase in capital requirements on bank lending and real activity is significantly larger than previously thought (De Nicolò, 2015).

An effective complement to capital is to increase the supervision of GSIBs and require them to develop and present credible recovery and resolution plans, by identifying critical activities to be maintained so as to avoid fatal disruptions in the provision of financial services. Setting up resolution and recovery funds is critical for ensuring the wider participation of the private sector in the sharing of the losses of insolvent banks. However, this should be done in a way to avoid contagion.

The separation of activities is another way to addressing the "Too-Big-to-Fail problem". Several countries have already put in place structural banking reforms and the European Commission is about to finalise its own directive. However, I am not fully convinced by such an approach. First, available evidence does not demonstrate the superiority or the optimality of a particular banking model or structure. Indeed, since the beginning of the crisis, some pure investment banks (e.g. Lehman Brothers, Bear Sterns), some pure retail banks (e.g. Spanish Cajas, Irish banks, Northern Rock) as well as some universal banks (ING) experienced significant trouble. Second, the separation of activities does not necessarily lead to less systemic risk in the system as the different components of a banking group may take on the same total amount of risks. In a recent paper with Regis Breton (2015), I argue that, from a financial stability perspective, any attempt to reform banking structures should address the following three challenges:

1. Preserve the benefits of the universal bank model, for both efficiency and financial stability considerations. In particular, risky but economically useful activities should remain within the perimeter of banks that are under strict supervision, have appropriate loss absorption capacity and are granted access to central bank facilities in times of stress.
2. Draw effective and welfare-improving lines between speculative and economically needed banking activities. In particular, market-making activities should not be separated from other financial services provided by banks to the real economy, like securities underwriting and hedging, especially in a context where the regulation fosters disintermediation and where banks will have to play a pivotal role in the transition period. This will contribute to well-functioning markets that can serve as a source of financing for European firms.
3. Finally, the regulatory reform should keep an eye on the viability of the trading entity to avoid two pitfalls: the inception of systemic trading entities; the migration of activities outside the regulated sector (i.e. to the shadow banking system). This implies that, in order to contain systemic risks, structural reforms in the banking industry must be accompanied by effective resolution regimes and tools and appropriate regulatory treatments of shadow banking activities. Otherwise, regulatory restrictions on bank activities will contribute to the migration of the too-systemic-to-fail problem to non-deposit taking financial institutions, in less visible but by no way more benign forms.

c. From the point of view of reducing systemic risk, is the TLAC proposal adequate, or is it still lacking on some critical aspects?

As stated by the Financial Stability Board, raising the total loss absorption capacity (TLAC) of systemic institution is an effective way to mitigate contagion risks and make sure there will be sufficient loss absorbing and recapitalisation capacity available in resolution to implement an orderly resolution that minimises any impact of financial stability, ensures the continuity of critical functions and avoid exposing the tax payers to loss with a high degree of confidence. Its benefits mainly come from enhancing market discipline of banks and thus containing risk taking. However, the current Financial Stability Board proposals raise several issues. A first issue is the neutrality of the TLAC

requirements vis-à-vis the bank business model. While the Key attributes for the effective resolution of systemic institutions designed by the FSB in 2010 where neutral vis-à-vis the bank business models, the TLAC proposal is clearly tailored for banking groups organised as bank holding companies, a model which is common in Anglo-Saxon countries but less developed in Continental Europe. This model effectively embeds structural subordination put forward as the silver bullet in the TLAC proposal. This already raises a level playing field issue. It explains why some European GSIBs, like UBS or Deutsche Bank are changing their legal structures and why the European regulators are scratching their heads to accommodate the Bank Resolution and Recovery Directive with the TLAC proposals or try to introduce some form of subordination within senior debt like in Germany. A second issue is related to the calibration of the TLAC requirements. The proposed calibration amounts to doubling Basel III requirements. This seems relatively large compared to the historical losses and the public recapitalisation needs for systemically important institutions that failed or received public support, in a context where precisely efficient tools for orderly resolutions where not in place. Empirical evidence suggests that the losses and recapitalisation together have been in a 4 to 6 percent range of total assets in average. While it is necessary to ensure that, after the resolution transaction, the entity or the group of entities emerging from resolution must meet the necessary conditions for authorization and be sufficiently well capitalized to command market confidence, it is questionable to require this entity or this group of entities rebuilt all its loss absorption capacity, including buffers as resolution is not resurrection. In addition, the calibration is not backed by any meaningful quantitative assessment, measuring its likely impact on the real economy. This suggests that doubling capital requirements can be done at no or minimal economic costs. A third issue is related to the capacity of the market to effectively absorb the capital shortfall resulting from the TLAC requirements. This shortfall is likely to be large, in particular for continental European banks. The current size of the market for bail-inable debt is around EUR 100 billion whereas the total shortfall is estimated around EUR 500 billion for European systematically important banks only and above EUR 1,000 billion for all the GSIBs. While is it likely that the market size will increase to partly accommodate for the supply, it is not clear that it will do so as to match with the total financing needs without

triggering another round of mergers and acquisitions that may result in even bigger systemic institutions. A fourth issue is related to who will hold these instruments. In order to limit contagion risk, it is desirable to strongly disincentivise internationally active banks from holding TLAC instruments issued by other GSIBs. But, what about the other institutional investors? Should authorities allow insurance companies or pension funds to hold such bonds? At a time where the business models of these institutional investors are already challenged in the very low interest rate environment, authorities should be cautious towards encouraging additional risk taking. One reason is that the ability of authorities to bail in these investors, in particular pension funds, might be limited and prove politically difficult in the wake of a financial crisis. Finally, the ability of such a debt market to effectively function during a systemic event still needs to be assessed. Would the central banks have to step in if such a market suddenly freezes or its investor base suddenly vanishes when systemic institutions precisely need to expand their loss absorption capacity? These are some of the challenges that need to be addressed before making a final decision on the TLAC requirements.

Bank capital requirements and lending to the real economy

a. Will the requirement of increased levels of loss absorption capacity cause a reduction in aggregate bank lending?

The impact assessment of the TLAC proposals on aggregate bank lending is currently underway. As far as I know, the calculation of this impact on bank lending and on GDP is based on the estimated increases in lending rates and the multipliers derived from the Macro assessment group exercise (MAG, 2010). This is not satisfactory as the MAG results, which showed benign impacts of Basel III requirements on economic activity, need to be updated. The MAG multipliers are heavily dependent on the initial conditions and the baseline scenario designed in 2010 by the IMF. The world has changed since 2010. The balance sheets of both private and public institutions have generally deteriorated, leverage have increased in the households, corporates and public sectors and central banks have massively intervened on the financial markets, helping banks to fulfil the Basel III requirements with limited impact on the

real economy and the funding costs. Doubling now the requirements, as contemplated by the regulators with the TLAC proposals, would have a far more pronounced impact. This is already evidenced by a bunch of papers showing that both the short term and long term costs of higher capital requirements would be much higher than those initially estimated in the MAG exercise. Recent advances in dynamic general equilibrium models, which encapsulate a proper banking sector by contrast with most of the models used in the MAG exercise, find an inverted U-shaped relationship between bank lending and capital requirements, which translates into an inverted U –shaped relationship between welfare and capital requirements (see for instance De Nicolo et al., 2012; Begenau, 2015 or Clerc et al., 2014). This means that there exists an optimal capital requirement above which additional units of capital have detrimental effects on the real economic activity. There are some variations regarding this optimal level of regulatory capital, which may vary according to the estimates in the range of 8 to 14% of risk weighted assets (RWA). But this is already significantly below the current TLAC proposals, which are comprised in the range of 16 to 20% of RWA, and which can pile up to 24% accounting for all the buffers. In Clerc et al. (2014), we show that high capital requirements insulate the economy from the bank net worth channel and prevent excessive volatility due to banks' excessive lending and excessive failure risk. But the negative effects on economic activity coming from the reduction in the supply of credit to the economy dominate when capital requirements are set too high (actually at levels in which banks' default rate is virtually zero).

b. In case of a reduction in bank lending, would this be replaced by alternative and perhaps less regulated sources of finance?

Tight bank regulation can effectively have the effect of shifting risks and the supply of financing to the other compartments of the financial system, and in particular to the "shadows". This is not necessarily a problem and this is in a way what is intended with initiatives like the Capital Market Union. The CMU is aiming at developing a more balanced financing model in Europe, with a greater role for direct or market-based finance. This may increase risk sharing, in particular with those investors more willing and more able to absorb and take on risks. And this may have the advantage of developing equity finance over debt finance. However, this may become an issue in the following

two cases: 1/ if the market is not willing to take on these risks at reasonable prices: this may indeed be the case for long term finance or for the financing of Small and Medium enterprises: in both cases, the presence of high fixed costs and asymmetric information have led banks, which are better equipped to deal with these issues, to take over the business; 2/ if the part of the financial system benefiting from this transfer is less or even not regulated and in turn become systemic and threaten financial stability. The effects of additional capital requirements may therefore be more pronounced in jurisdictions where banks tend to play a greater role in the financing of the economy. The sign and size of the impact is however less clear cut in the long run where bank credit to the private sector generally tends to be correlated with slow economic growth, in particular compared with stock markets, and slows economic growth more than bonds (OECD, 2015).

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Loss absorbing capital and bank asset allocation

by Carmelo Salleo[39]

A key outcome of the crisis has been to reduce externalities imposed by banks on taxpayers via moral hazard induced by the too-big-to-fail problem. The solution so far has been to mandate that G-SIBs internalize such costs by having higher capital requirements, and to shield taxpayers by mandating a clear structure of bank liabilities with sufficient loss absorbing capacity (TLAC). These measures are meant to reduce costs ex post but clearly they will change banks' incentives and business models ex ante. The question is: how?

As an economist I tend to have a two-handed view of issues, and since I don't have to engage in forecasting or storytelling for a living I will enjoy the luxury of presenting two sides of a few arguments and let the reader decide which one sounds more convincing. I will also not bore the reader with citations but she will surely recognize where most arguments come from.

I will deal with three interconnected issues: a) TLAC and bank assets: will the requirement of increased levels of loss absorbing capacity for G-SIBs and its structure impact on the composition and riskiness of bank assets? b) TLAC composition and bank assets: how do different instruments used to satisfy TLAC requirements affect banks' asset allocation and risk taking? c) TLAC and banks' ALM: will banks' traditional ability to transform illiquid and risky assets into liquid and safe liabilities (such as demand deposits or short-term

39. ECB. The author is grateful to Barbara Attinger for very helpful comments. Opinions expressed are those of the author and do not necessarily reflect those of the ECB or of the Eurosystem.

wholesale funding) be affected by the requirement of increased levels of loss absorbing capacity?

a. Will the requirement of increased levels of loss absorbing capacity for G-SIBs and its structure impact on the composition and riskiness of bank assets?

The first question one should ask is: to what extent can banks choose to be a G-SIB and therefore also subject to TLAC requirements, and would they rather want to be in or out?

Because the Basel methodology is based on simple balance sheet indicators, to some extent banks can position themselves – however given that the score of each bank depends on the values of the indicators for other banks it is unlikely that banks' balance sheets will be much affected by formal considerations derived from this methodology. Besides, the banks that are borderline are relatively few.

As for whether to be in or not, there is a trade-off. On one hand being in means a higher loss absorbing capacity requirement, which is costly (in a non-MM framework which is what most practitioners assume, although they might be wrong in the broad sense that the weighted average cost of capital might not be very different if banks were to hold much more equity). On the other hand, being in can be seen as a marketing tool: this bank is a systemic player of the highest relevance, will not be let go bankrupt whatever happens (although ironically strictly speaking TLAC is actually about lining up creditors to bear losses), is in the A-league, etc. This could be beneficial in terms of attracting business, especially in periods of uncertainty – which is when business tends to flee banks. So trying to be in if their competitors are might make sense. In fact, supervisory judgement was used in two cases to classify as G-SIBs banks whose score put them relatively far from the lower threshold of the methodology. One might wonder whether supervisors were being extra prudent or had also some competitive issues in mind.

So at least for banks close to the threshold the new regulations might affect M&As strategies, as getting closer might imply becoming a G-SIB, which in turn implies as stated above higher costs but also new opportunities. One might expect more M&As among G-SIBs, which therefore might become even larger and more systemic, and less among almost-G-SIBs. If this is the case, market structure will be polarized between ever larger, more complex and internationalised institutions on one side and medium-sized, at most D-SIBs on the other - although the resolution authority has to give a green light to such

deals based on the resolvability of the new structure – and can even mandate divestitures - so this could actually limit polarization.

Once it is determined that a bank is G-SIB, how will this affect its business model? Again, there are two possible views.

On one hand, the combination of G-SIB buffer and TLAC should increase its resilience ex post, i.e. there is more loss absorbing capacity per unit of risk. This assumes that even if the bank increases its risk taking this is captured by capital requirements and requirements to issue TLAC-eligible liabilities so in fact the bank should be relatively indifferent to requirements that affect its situation in resolution as long as going concern rules are sufficiently binding.

On the other hand, since these new requirements are costly banks might try to improve returns by taking on risks that are not adequately captured by the current regulatory framework, i.e. tail risk and other forms of systemic risk.

If the current environment of low interest rates persists, and if markets keep demanding high returns on bank equity, the second option might become more cogent.

The issue is then whether markets will react to all these changes in regulation by lowering their expectations about banks' overall cost of funding, since they have become safer ex post for most creditors. However it is unclear that this would happen, since banks are safer mostly for creditors, existing shareholders are being diluted and returns to future shareholders depend also on how risk taking will change. The cost of equity will decrease only if investors perceive banks to have become safer, in the sense of more like a utility that provides services than an investment business – but this doesn't seem to be the case (yet). So as long as the spread between expected return on equity and the risk-free rate is high, and banks are required to hold more capital, there is an incentive to increase risk-taking in forms which are not adequately captured by regulation.

b. How do different instruments used to satisfy TLAC requirements affect banks' asset allocation and risk taking?

The issue of how the composition of TLAC affects risk taking is key right now as banks are gearing up to choose how to absolve this requirement but it is probably too specific for a meaningful answer at this stage. Markets expect banks to fulfil TLAC requirements overwhelmingly with new equity, new in-

struments such as CoCos and subordinated debt, rather than with senior unsecured debt – hence the effects described above. Senior unsecured debt could come back into play with an important role if, following the example of German law, a statutory subordination clause would make it automatically eligible for TLAC – this would need to be done via EU law and would dramatically reduce the existing shortfall at least of SSM G-SIBs, but it is not foreseen yet.

The impact of new equity on banks' asset allocation and risk taking is again unclear. More equity allows banks to take on more risk and creates incentives to do so; the meaningful question is whether this increase in risk is more than proportional to the increase in capital. Again, if regulatory requirements are correctly anchored to risk this shouldn't be an issue, but if not banks might engage in covert risk taking. so we are back to hoping that the Basel framework is correctly specified in terms of mapping a complex, evolving multidimensional concept such as risk into a single variable such as capital, however layered.

How CoCos affect risk taking is also unclear. In theory they could lead to more risk-taking (and there is some academic literature that explains why and how), but there is no evidence so far. Depending on whether they are principal write-down or conversion to equity the balance of risk between senior unsecured debt holders and shareholders is very different (CoCos holders are assumed to at least break even since they are buying a new class of securities, the issue is whether there is risk shifting among existing stakeholders).

In the first case they protect debt holders without diluting shareholders so the impact on risk-taking should be small, in the second case the perspective of dilution in case of negative events might lead bank managers to be more prudent ex ante. It should be noted however that even in the case of principal write-downs in the medium term the bank will probably need to recapitalize, so in the end the difference between the two sorts of instruments might be small and/or mostly in the short term. The issue is clearly an empirical one.

If banks will have to issue senior unsecured debt in significant amounts to comply with TLAC requirements, this debt will probably be re-priced to take into account its bail-in-ability. The key legal issue, which has financial consequences, is that such debt needs to be either statutorily, structurally or contractually subordinated. US banks can easily use structural subordination (debt issued by the holding company) but in Europe this is less easily done and could lead to higher costs.

Again, either banks take this as exogenous and increase risk to increase returns and restore margins, or they reduce risk in a sufficiently credible way that it passes through in their funding costs. The danger is that of hysteresis: if at the beginning markets are sceptical and price upwards senior unsecured securities, banks might be tempted to increase risk and enter therefore into a negative spiral. It would be important then to first give credible signals of risk reduction before issuing such instruments. The timeline of TLAC would allow for this but the urge to frontload to show strength vis-a'-vis competitors might work the other way round.

In the nineties many advocated market discipline as a way to keep banks in check; however the experience of the crisis has been that market discipline is most lax when it should be severe and most severe when the economy as a whole would need some level of forbearance.

TLAC mandates the issuance of the securities which are the most information-sensitive. A possible unintended consequence of such choice is an increase of the role of informational asymmetries and conflicts of interest – phenomena such as risk shifting across classes of liabilities and hidden risk taking might be on the rise, and as we have seen with the crisis when there is a negative shock they act as amplifiers as investors realize that they were fooled and sell off en masse: what started as an effort to reduce systemic risk might end up increasing it in some situations.

This might be second-order compared to the benefits of increased overall resilience but needs to be better understood and monitored. In particular it might entail demand for greater transparency (which would be good and also decrease the ability of banks to take on hidden risks) but also more inefficiencies in capital allocation if such asymmetries are perceived to be too great and lead to debt overhang issues at lower levels of debt than currently.

c. Will banks' traditional ability to transform illiquid and risky assets into liquid and safe liabilities (such as demand deposits or short-term wholesale funding) be affected by the requirement of increased levels of loss absorbing capacity?

One issue which would need to be better understood is how TLAC will affect collateralized funding by banks. Mechanically TLAC increases the share of banks' liabilities which cannot be collateralized (equity, CoCos, senior unsecured debt) as the purpose is precisely to increase "generic liabilities" to

protect the rest of the balance sheet. This would lead to a decrease of collateralized funding such as repos – and therefore of the transformation of illiquid assets into liquid and safe liabilities. However if banks deem this form of funding particularly convenient they might keep it going and decrease other forms of funding, mainly deposits (which are also liquid and safe). So there might be a decrease in the liquidity transformation function of banks, and concurrently a change in the composition of liabilities depending on the relative merits of the various instruments. For this second effect conjunctural conditions are likely to be the key drivers.

On the other hand, TLAC should make the other liabilities of a bank safer, and to the extent that there is excess demand for safe assets, which for the time being is not being directed towards banks' liabilities, then this should encourage banks to provide more of such securities.

Financial innovation might also play a role here (as for the issues discussed above). New contractual forms might be designed to make the best use of existing balance sheets once the TLAC part is taken out, and reduce whatever slack there is.

A related question would be: how does TLAC affect the liquidity transformation performed by the banking system at large, since it will affect only the largest banks? In fact these banks tend to be those whose assets are already more liquid. They have larger trading and securities portfolios, smaller loan portfolios and are more skilled in creating structured products. So if TLAC reduces their ability to provide such a service in the face of excess demand, they might transfer their skills to smaller banks, either by acquiring them (however see point above on M&As) or by selling advisory services.

So the bottom-line is: TLAC will change G-SIBs' incentives and affect both sides of their balance sheet. How this will play out will depend among other factors on how well the rest of the regulatory framework holds up to increased incentives to risk taking, and on how markets perceive banks' moves. The overall impact on the financial system is difficult to gauge, but TLAC should also change the relationship between G-SIBs and the rest of the banking system. Supervisors will need to dialogue closely with all players to understand changes in business models and not be caught off-guard by developments that are usually more about intangibles such as risk appetite than about quantifiable variables.

TLAC implementation in retail banks in Emerging Markets: the Multiple Point of Entry model

by Santiago Fernández de Lis[40]

Q: What is the relation between TLAC and the banking organisational models?

Achieving an effective resolution regime to resolve banks quickly, avoiding disturbances to the financial system, minimizing the use of public funds – thus protecting taxpayers – and ensuring continuity of the critical financial services is one of the main goals of the authorities in the current regulatory reform. The FSB TLAC proposal is one of the cornerstones of this reform. Banks must have enough liabilities with loss-absorbing capacity in order to ensure that institutions are easily resolvable and shareholders and creditors shoulder the bulk of the recapitalisation burden.

International banking groups vary significantly in their business models, corporate and legal structures, and their financial and operational interdependencies. The optimal design of the TLAC should take into account the firm's idiosyncratic characteristics. In fact, the TLAC requirement should be flexible enough to accommodate the different banking structures. The way cross-border banks plan to die should be consistent with the way they lived.

The FSB outlines two polar resolution approaches for resolving global banks: the Multiple Point of Entry (MPE) and Single Point of Entry (SPE) resolution strategies, although many hybrid options may lie in between.

40. BBVA

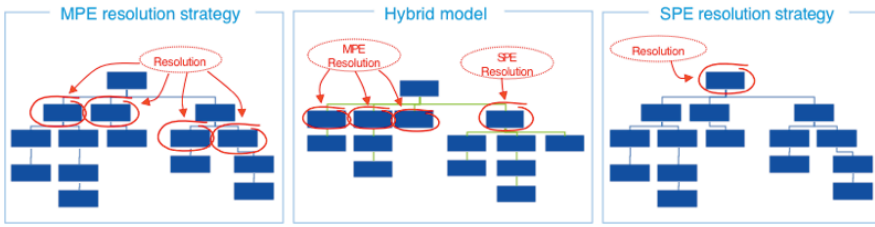
- Multiple Point of Entry: This involves the application of resolution powers by two or more resolution authorities to different parts of the group, including strategies in which a group is broken up into two or more separate parts. There is no need for the resolution powers applied to the separate parts to be the same, and they could involve different resolution options. This implies that each legal entity or sub-holding in the group that may be subject to a separate resolution action should have sufficient TLAC individually to cover its likely losses in resolution and those of subsidiaries below it for which a separate resolution is not planned[41]. This strategy fits with decentralized business models based on subsidiaries, local retail funding and very limited intra-group positions.
- Single Point of Entry: A single national resolution authority applies resolution powers at the top level (either holding or parent company). The SPE strategy operates through the absorption of losses incurred within the group by the ultimate parent or holding company through, for example, a bail-in. Therefore, TLAC in SPE banks should be placed at parent level and downstreaming to each material subsidiary via internal loans or collateralized guarantees, so-called internal TLAC. Internal TLAC mitigates host resolution authorities' concerns that the home authority may not trigger bail-in at the parent company level and then recapitalize the loss-making bank subsidiary. This strategy fits naturally with the model of branches, with wholesale funding and sizeable intra-group positions.

SPE and MPE resolution strategies are the opposite ends of a spectrum where many resolution options may lie in between. There is no binary choice between the two approaches. In practice, a hybrid approach, which combines both schemes, might be appropriate to accommodate the structure of a bank to the local regimes in the key jurisdictions where it operates. This could be the case of the Eurozone, where recent progress towards Banking Union and related institutional developments have paved the way to implement a feasible SPE scheme for a banking group with presence in two or more Eurozone countries. In particular, advances in terms of a Single Rule Book, a Single Super-

41. See Fernández de Lis (2015)

vision Mechanism, the Bank Recovery and Resolution Directive (BRRD) and the Single Resolution Mechanism (SRM) are breaking down the national banking barriers and paving the way to a single jurisdiction in the Eurozone.

Figure 1 (BBVA Research)



Q: How could be the TLAC be business model neutral?

A key challenge that the FSB has to face is to develop a business model-neutral TLAC approach. As a general principle, the implementation on the TLAC should not create "per se" incentives for banks to move artificially from one model to the other. As regards the MPE resolution scheme, two key characteristics should be preserved:

– MPE banks should not have to comply with a TLAC requirement at consolidated level but at the resolution entity level. TLAC at a consolidated level in an MPE bank does not reflect the real loss-absorbing capacity across the group. In fact, any resolution group in an MPE bank will have to issue its own TLAC-eligible instruments to potentially absorb its own recapitalization needs. Thus, any excess of TLAC in a resolution group will not be used to compensate any potential shortfall in a sibling resolution group within the whole MPE group. For this reason, the total TLAC needs in an MPE group should only be calculated as the sum of the external TLAC of each resolution group. The TLAC at each MPE subsidiary should be based on the local regime with similar characteristics as the domestic players, thus ensuring a local level playing field. The TLAC guidelines proposed by the Financial Stability Board are applied in a first instance only to G-SIBs. However, it will be for each country to put in place the legal framework which implements TLAC. Host resolution regimes will need, therefore, to be applied to Domestically Systemically Important Banks (D-SIBs) as well as G-SIBs. If not, they will not address the Too-Big-To-Fail problem in a comprehensive manner within each jurisdiction.

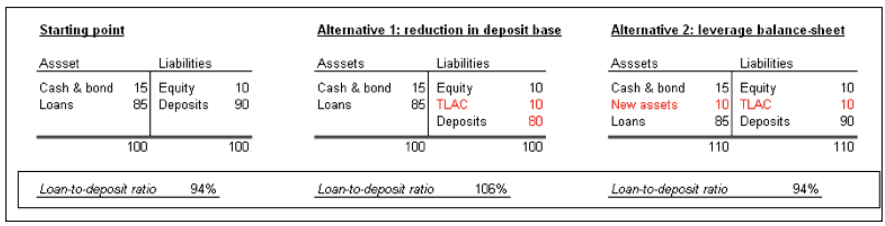
Q: What is the impact of TLAC on the funding structure of MPE subsidiaries funded with retail deposits?

Most of the subsidiaries of the GSIB which would comply with MPE characteristics are located in emerging markets. This emerging market footprint determines the challenges that MPE subsidiaries will face in complying with the TLAC requirement.

First, most emerging countries have a limited degree of development of local capital and debt markets. Second, the limited local investor base is very narrow and mainly composed by insurance companies and pension funds. Their low-riskiness investment mandates would probably set limits to invest in debt instruments with loss-absorbing and subordinated features. Finally, those subsidiaries in emerging markets are highly capitalised and are mainly funded with deposits.

Against this backdrop, deposit-funded subsidiaries located in those markets would be forced to issue either external or internal TLAC-eligible liabilities. As shown below, deposit-funded banks have at least two alternatives in order to comply with the TLAC requirements, which would call into question their retail and stable funding model.

Figure 2 (BBVA Research)



- On the one hand, banks may issue new TLAC-eligible liabilities but at the cost of reducing the deposit base. This would imply, among other effects, a deterioration of the funding profile. In particular, the loan-to-deposit ratio would significantly increase.
- On the other hand, banks could maintain the deposit base but artificially expand their balance sheets. The new TLAC-eligible liabilities would imply a significant increase in the funding costs. In order to compensate for the higher funding costs, banks would be forced to invest

these funds into riskier assets, typically in foreign currency, as explained below.

At the end of the day, either the reduction of deposit base or the leveraging of the balance sheet would lead to an overall increase of systemic risks and vulnerability to global liquidity shocks, thus increasing the pricing of the cost of credit to the economy. These are not desirable outcomes.

As stated above, MPE subsidiaries must comply with their own TLAC requirements as independent resolution entities. Whether this requirement is fulfilled by external or by internal TLAC, both options entail negative effects on financial stability in EMEs since either they increase the dependence on cross-border wholesale funding and foreign currency (in the first case) or they jeopardize the MPE model (in the second case). There are several channels through which these effects operate:

First, MPE subsidiaries operating in emerging economies would be forced to issue TLAC-eligible instruments in foreign currency since their local debt and capital markets are not developed enough to assume the expected issuance of TLAC paper. A particular concern is the potential issuance in foreign currency, since it will increase procyclicality and instability risks. Local regulations in emerging countries usually require banks either to match liabilities in foreign currency with assets in the same currency or to hedge those positions. The former would increase the vulnerability of the local financial system paving the way to potential contagion and/or exacerbating credit risk when there is a mismatch between the currency denomination of the debt and the currency denomination of the debtors' income. Argentina in 2001 and more recently Hungary have shown the potential risks of foreign currency lending for retail domestic customers. If currency hedging techniques are used instead, the profitability of the institution would be penalized and it will create maturity mismatches.

Second, issuing TLAC-eligible liabilities would increase cross-border lending, with potentially negative effects in financial stability of host countries. As the IMF has recently acknowledged on its Global Financial Stability Report of April 2015[42], "*the shift to more local as opposed to cross-border operations results*

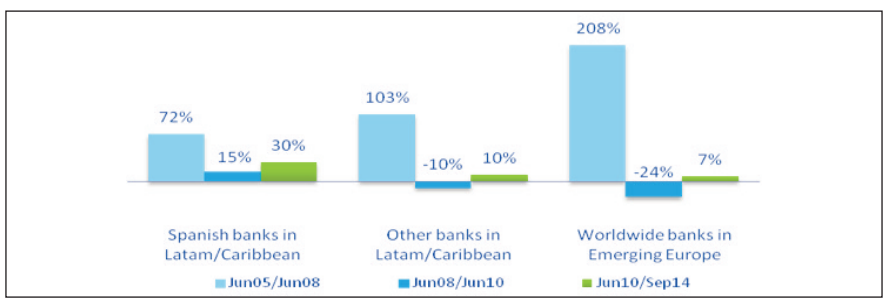
42. IMF Global Financial Stability Report (April 2015)

in a decline in the sensitivity of capital flows to global shocks and yields a reduction in contagion". According to this analysis, subsidiaries in emerging markets operating locally with an unbiased deposit-funded model behave less procyclically and are more resilient to withstand global shocks, but not necessarily idiosyncratic shocks.

Finally, instead of issuing externally, MPE subsidiaries may issue TLAC debt to the parent –the so-called internal TLAC. This would however jeopardize the viability of the MPE resolution scheme. One of the main prerequisites of the MPE model is the lack of systematic interconnections between the parent and its subsidiaries. Therefore, forcing the MPE parent bank to absorb TLAC-eligible liabilities issued by its subsidiaries may question the credibility of an independent resolution process for each resolution entity within an MPE group.

The recent Eurozone crisis has provided empirical evidence of the MPE business model strengths in terms of limiting contagion. Although the solvency problems in Spain were confined to savings banks, the liquidity restrictions affected all peripheral banks in a context of fragmented Eurozone financial markets, especially in 2010-2012. There was almost no contagion of these liquidity problems to Spanish banks' subsidiaries in Latin America, in sharp contrast with the impact of the euro crisis in Central and Eastern Europe, where European banks' branches operated mainly through cross-border lending with the parent. As Figure 1 shows, Spanish banks in Latam (with an MPE model) smoothed both the bubble and the bust, as compared to other international banks in the region (mostly SPE) or to international banks in Emerging Europe (also mostly SPE, based on branches or centralized model subsidiaries).

Figure 3 - Changes in foreign claims of reporting banks to Latam and Emerging Europe (BBVA Research)



To sum up, in the definition of TLAC and its application to emerging markets, regulators should avoid penalizing a model that has worked well in limiting contagion during the global crisis. This flexibility – which has been introduced for banks headquartered in emerging markets, but not for resolution entities with the same geographical scope – should apply to elements like the sizing of TLAC, the part to be covered with senior debt or the definition of internal TLAC.

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