

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

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## 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-

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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 sub-optimal 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-weight 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-weights 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.<sup>9</sup>

#### 4. Capital requirements and the real economy<sup>10</sup>

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 is 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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