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THE IMPACT FOR SPAIN OF THE NEW BANKING REGULATIONS PROPOSED BY THE BASEL COMMITTEE

Research Department

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Abstract

This document provides a preliminary assessment for Spain of the transition costs arising from the adjustment to the new solvency and liquidity regulation of banks proposed by the Basel Committee of Banking Supervision on 17/12/2009. Based on publicly available data, we estimate the shortfall of core capital for the Spanish banking system and the need for additional liquidity. We discuss several corrective actions that credit institutions could take to adapt to these new requirements, as well as their implications for outstanding credit and GDP levels under three different scenarios of market openness and length of the transition period.

Keywords: Regulation, Banking, Financial Crises.
JEL Classification: G01, G21, G28.

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Executive Summary

This document provides a preliminary assessment of the macroeconomic impact for Spain caused by the adjustment to the new solvency and liquidity regulation of banks ("transition cost"), proposed by the Basel Committee of Banking Supervision on 17/12/2009.

Based on publicly available data, we estimate a shortfall of core capital for the Spanish banking system of approx. €48 bn and a need for additional stable funding of approx. €300 bn by 2012.

We expect the Spanish Credit Institutions ("CIs") to adapt to these new requirements by changing, inter alia, their balance sheet structure. These corrective actions include the disposal of non-core assets (real-estate, equity holdings in both financial and non-financial investments, corporate bonds), re-intermediation of off-balance sheet liabilities (pension and investment funds) and changes to the term structure of both loans (decreasing average maturity) and deposits (increasing average maturity). This might trigger undesired effects, such as a partial loss of the fundamental role of maturity transformation played by the banking system, the discouragement of private retirement savings in the form of pension and investment funds, obstacles to the internationalization process of the Spanish banking system and a weakening of its role as a stable shareholder, especially for strategic businesses (utilities).

We estimate that these actions may reduce the capital shortfall by €12 bn and the stable funding gap by up to €115 bn. The ability to obtain enough capital and stable funding to make up for the remaining gaps depends crucially on the timing of the introduction of these measures, the recovery of international capital markets, the access to capital markets by the Savings Bank sector and the willingness of current shareholders to accept dilution.

In the most likely scenario, we expect the Spanish credit institutions to be able to recapitalize only about half of their capital needs (€18 bn). Therefore, in order to comply with the new regulation, they would need to restrict credit by about 14% according to our estimates. This decline in credit would suffice to meet the new liquidity requirements. Using recent econometric estimates provided by the ECB, this reduction of credit outstanding might have an impact on GDP levels of -5.0%

in the long term.

In a best-case scenario, where Spanish institutions were to have no difficulties in raising sufficient equity capital in the market, they would still face a significant challenge in terms of stable funding: a remaining funding need of approx. €158 bn. (even after accounting for the corrective actions described above). This is equivalent to approx. 24% of their current long term debt outstanding. Failing to raise half of these funds would again impact negatively on credit (-5%) and GDP (-1.6%).

It is important to emphasize that these results are preliminary and must be interpreted with utmost care: they are based on numerous assumptions due to incomplete information and subject to important uncertainties. The objective of these computations is to present a first and rough approximation of the potential impact and shed some light on its order of magnitude. By no means are they intended to substitute or advance the results of the Quantitative Impact Study carried out by the Basel Committee.

numbers in € billion

BIS III Impact

Capital		*Liquidity*	
Deduction of minority stakes	-16	Available stable funding	1,740
Gap of provisions vs expected los	-12	Required stable funding*	-2,180
Deduction of minority interests	-12	Organic improvement until 2012	140
Deduction of deferred tax assets	-8		
Total capital shortfall	-48	Total liquidity shortfall	-300

Alternative Scenarios

	Most likely scenario	*Best case scenario*
Capital		
Initial capital shortfall	-48	-48
Asset reorganization	12	12
Recapitalization	18	36
Remaining capital shortfall	-18	0
Necessary credit reduction	**-14%**	-
Liquidity		
Initial liquidity shortfall	-300	-300
Asset reorganization	36	115
Impact of recapitalization**	18	27
Impact of credit reduction**	229	-
Remaining liquidity shortfall	-17	-158
Additional international wholesale funding		79
Necessary credit reduction		**-5%**
Impact on GDP level (long term)	**-5.0%**	**-1.6%**

** Contingent claims are weighted at 20 %*

*** Due to reaction of Credit Institutions to capital shortfall*

Overview of the estimation of the impact of the new regulatory proposals

Contents

1 Introduction

The purpose of this document is to provide a broad approximation to potential macroeconomic effects for the Spanish economy of the new proposals on banking regulation presented by the Basel Committee on Banking Supervision on 17/12/2009. In a first step, we focus on the impact of new capital requirements. In a second step, the introduction of the new liquidity ratios is assessed as if the solvency regulation had not changed. As a final step, we perform a broad assessment of the overall transition costs by considering several possible scenarios, taking into account the interaction of the banks' effort to meet both capital and liquidity requirements[1]. Except where otherwise stated, the estimations are based on data referring to the whole Spanish Banking System, which includes commercial banks, savings banks, credit cooperatives and specialised financial institutions.

The results presented in this paper are preliminary and must be interpreted with utmost care: they are based on numerous assumptions and subject to important uncertainties. Moreover, we expect still a lot of work to be done by the BCBS on further specifying, fine-tuning and adapting the proposed rules after the consultation period and once the Quantitative Impact Study has been carried out. The computations in this paper are hence to be interpreted as a first and rough approximation of the potential cost with the objective to shed some light on its order of magnitude.

2 Capital Requirements

2.1 Estimation of the shock to the capital of the Spanish Banking System

By end of 2009 the Spanish Banking System had a level of Core Capital of 8.1% of risk weighted assets (RWA), up from 7.1% in 2008. We expect Core Capital levels to further improve through 2012 for two reasons. First, a probable reduction of capital requirements due to negative credit growth and a reduction of risk weights (especially in IRB models and through reduction of non-performing loan balances).

[1] An assessment of the potential benefits derived from an increase in financial stability once the new rules are operating is subject to even stronger uncertainties and hence left outside the scope of this document.

Second we expect the Spanish Banking System overall to remain profitable. Based on own estimates, assuming an overall loss rate on credit exposure of around 5% (in-line with market estimates), we expect an increase of core capital through retained earnings of around 75 bp until 2012[2]. Overall, we expect core capital to stand at around 9% by 2012 through internal capital generation and before implementation of the new proposals.

So far, there is no information about the future level of minimum capital requirements for Core Capital. We however believe that the market will push for significant capital buffers above the yet-to-be-defined minimum requirements. The size of these buffers required by the markets will depend substantially on the type of anti-cyclical buffers Basel III itself will introduce and the way the new regulation allows banks to draw on these buffers both in times of macroeconomic recession or bank-specific crises. Currently most market analysts use target levels for Core Capital around 7% - 9%. We believe that the Spanish Banking System will be able to comply with or even exceed the new minimum capital requirements both from regulators and markets, given its excellent starting point and capacity of internal capital generation. However, we do not take into consideration a potential capital surplus above the required levels in our calculations. This conservative view is due to the uncertainty around the final impact of credit losses and the fact that heterogeneity between players typically leads to a higher-than-required average level of capital on a system-wide level.

Nonetheless it will be necessary to neutralize the impact of adjustments to the quality of capital of the new regulatory proposals. Based on the available and estimated data for the Spanish Banking System for year end 2009 we estimate the overall impact of the new proposals on available Core Capital to amount to approx. €47.7 bn, reducing core capital by 2.3 percentage points[3]. This reduction in capital stems mainly from the full deduction of minority stakes in financial and insurance subsidiaries from core capital (€16 bn), the imputation of the gap of provision levels vs. one-year expected loss (€12 bn), the deduction on minority interests (€12 bn) and the deduction of deferred tax assets (€8 bn).[4]

[2]This is in line with estimates published by the IMF. In its latest Global Financial Stability Report (April 2010) the IMF estimates a gross capital addition of €13 bn in its adverse case scenario. Using our estimation of RWA of €1,287 bn (net of international operations of BBVA and Santander) and a tax rate of 30%, this would translate into a net capital increase of 71 bp.

[3]Details on the assumptions and computations of the shock to the Spanish Banking System can be found in Appendix 1.

[4]These are preliminary estimates, subject to change once more detailed information will be

2.2 Banking institutions' reaction to the shock

In order to raise the estimated increase in regulatory capital, credit institutions could take several actions. We assume that credit institutions would first resort to the least costly among them. According to this assumption, the reaction of Spanish credit institutions would potentially follow these steps:

Reorganization of the non-credit asset portfolio to reduce capital requirements and realize capital gains. To this end, we have considered several options for Spanish Credit Institutions:

- **Sale of acquired or repossessed real-estate assets:** We estimate the book value of real-estate assets acquired or repossessed by Spanish Credit Institutions ("CIs") to be around €50.3 bn. Given that their current book valuation is conservative (LTV of 80% and additional 20% of prudential provision required by the Bank of Spain) we assume they can be sold without having to realize further write-downs. Selling 30% of these assets would free up €2.0 bn of regulatory capital through the reduction in risk-weighted assets (RWA) of around €22.7 bn –their weighting being 150%.[5]

- **Sale-and-lease-back of branch offices:** The book value of CIs' real-estate assets used in the provision of financial services is estimated to be around €33 bn. However, only branches in prime locations which are not subject to potential rationalization efforts could be included in the lease contracts. Moreover, the market will be only able to absorb a certain amount of this type of assets. And still, the positive short term effect on CIs' capital through the realization of capital gains and a reduction of RWA only comes at the expense of higher fixed costs (as rental payments will exceed amortization charges by far) and, hence, lower profits for the rest of the contracts' lifetime. Thus, CIs will be willing to sacrifice these future revenues only if capital requirements are to be implemented in a very short period of time and are of substantial magnitude. Assuming that the credit institutions would be able and willing to sell up to 30% of the branch offices, the operation could free €0.9 bn of

available for year-end 2009.

[5]Selling 30% of 50.3 bn of assets reduces assets by 30% x 50.3 bn = 15.1bn and RWA by 150% x 15.1 bn = 22.7 bn. At a target core capital ratio of 9% this is equivalent to freeing up 9% x 22.7 bn = 2.0 bn of capital.

regulatory capital (risk-weighting of 100%).[6] Furthermore, we estimate that the sale could produce €5.3 bn. of after tax capital gains[7]. In total, Spanish CIs could cover €6.2 bn of the capital shock.

- **Divestiture of assets with high risk-weighting:** Basically, this amounts to selling non-core assets of Spanish CIs which are penalized by the regulatory proposals (shares and other securities, minority interests in banking, insurance subsidiaries, trading exposures, etc.). Given that most of these assets respond to strategic decisions that may be key to the competitiveness of financial groups – internationalization process, realization of economies of scope, etc. – those CIs with better access to capital markets or stronger solvency situations will try to avoid this kind of divestitures. We thus assume that the largest financial groups in Spain (i.e. Santander, BBVA and La Caixa) will not choose this option. Based on information from the Bank of Spain we estimate the risk weighted asset value of equity holdings at about €53 bn. Additionally there would be an effect on regulatory capital from the divestiture of minority stakes in banking and insurance subsidiaries through the removal of deductions from common equity. Deductions due to investments are estimated to amount to €5.5 bn, while those due to goodwill amount to €2.7 bn (excluding SAN, BBVA and La Caixa). Assuming disposal at current market values (no fire sales) of 30% of this portfolio would free up €3.9 bn[8] of regulatory capital.

Solvency: reorganization of the non-credit asset portfolio *(eur bn.)*	
Sale of acquired or repossesed real-estate assets	2.0
Sale and lease back of branch offices	6.2
Divestiture of assets with high risk weighting	3.9
Total adjustments	**12.1**

Overview of assumed CI's reaction to solvency regulation

[6] Selling 30% of 33 bn. worth of assets reduces assets by 30% x 33 bn. = 10bn and RWA by 100% x 10 bn. = 10 bn. At a target core capital ratio of 9% this is equivalent to freeing up 9% x 10bn = 0.9 bn of capital.

[7] Based on recent market transactions we estimate gross realizable capital gains of €0.6 millions per branch office, 12,500 branches sold (30%) and a tax rate of 30%.

[8] 1.5€ bn. from the reduction of risk weighted assets (30% of 53 € bn) plus 2.4€ bn (30% x (5.5+2.7) € bn.) through the elimination of deductions from core capital.

In sum, a profound reorganization of non-credit asset portfolio could provide Spanish CIs with the equivalent €12.1 bn of high quality capital.

After this reorganization, Spanish CIs would still need €35.6 bn to restore the core capital ratio of 9% expected for 2012 under the old framework. They would have two alternatives to raise them: new capital issuances or reduction of on-balance-sheet credit (through restrictions on new credit or securitization of existing credit).

Issuance of new capital instruments that can be recognized as core Tier-1 capital. The amount of new capital that will be raised by Spanish CIs will depend both on the depth of the market for equity investments in Spanish credit institutions (supply) as well as on the equilibrium price. In this respect, there are several considerations to be made:

- **We expect the capital supply curve to be relatively elastic up to a certain amount** of capital supplied to credit institutions and **completely inelastic above this amount.** Given the global nature of the regulatory shock, we may then observe an excess demand of capital that will not be satisfied at any reasonable price. Hence, some kind of rationing may arise that will force less solvent institutions to leave the market or be rescued by their governments.

- **We consider a return of 9% to be a reasonable market price of capital.** This number corresponds to the entry level of returns to public capital accepted by the European Commission for state aid to solvent institutions. Those returns were judged to be close to those that a private investor would require under normal circumstances, correcting for the mislead perception of risk that existed before the crisis[9]. This number also lies in the upper range of returns to public funds required under the Spanish recapitalization scheme (FROB). Implicitly, we are assuming that any upward pressure over this price caused by the significant number of institutions demanding capital would be compensated by the decrease in the risk of the banking business brought about by the new requirements or will trigger capital rationing due to the negative signal send to the market.

[9] Commission Comunication (2009/C 10/03): "The recapitalisation of credit institutions in the current financial crisis: limitation of aid to the minimum necessary and safeguards against undue distortions of competition", 5 December 2008.

- To ensure the remuneration of capital at this price, **CIs need to compensate the increase in total average costs with an increase in revenues.** Thus, the amount of capital demanded will be determined by the feasible increase in revenues they can achieve. Under these circumstances, for every €10 bn demanded to capital markets, Spanish CIs would need to increase pre-tax operating margins by €1.3 bn[10], or 0.8% compared to 2009 levels. Assuming that demand on deposits and commission related services is more elastic, the necessary increase of operating margins needs to be achieved by a rise of credit margins of 13 b.p. over the next years[11]. This parallel shift of the supply curve might have effects on equilibrium level of credit, but in our scenarios they are typically dominated by the effects caused by balance sheet constraints induced by the new regulations[12]. In addition to the parallel shift, these constraints generally cause a kink in the supply curve in a way that demand tends to intersect supply in most cases in its vertical part. To see why this is the case, notice that half of the Spanish demand for loans, household loans, is fairly inelastic with an estimated semi-elasticity of around -1.6 (i.e. an increase of 100 b.p. in the interest rate would decrease outstanding loans at most by 1.6%)[13]. The necessary increase of credit margins as a result of a capital increase of €10 bn would hence translate in a reduction of the level of outstanding loans of around 0.2%. The necessary credit reductions that arise from our scenarios are of a higher order of magnitude and are, thus, dominant.

- This apparent positive result on the feasibility of recapitalization needs three qualifications:

  - First, not all the Spanish CIs have the same access to capital markets. In particular, savings banks cannot issue common shares due to statutory

[10] 9% x 10€ bn / (1-30%) = 1.3€ bn

[11] The price adjustment can only be made on new credit. We assume that 55% of the credit to private sector (1.820 €bn) could be renewed until 2012. 1.3€ bn / (55% x 1.820€ bn.) = 13 pb

[12] See page 13 in this section for the balance sheet constraints and section 4 for the dominance of these constraints.

[13] See Nieto (2007). Marqués et al (2005) estimate the semi-elasticity of loans to non-financial firms and finds it to be significantly more elastic, i.e. an increase of 100 b.p. in the interest rate would decrease outstanding credit by 10%. Nevertheless, the authors themselves notice that this high sensitivity is influenced by the boom in loans to the real-estate sector. The efforts to remove this influence have yet to produce compelling results but so far the authors' estimations suggest an impact of 5% to 8% on outstanding loans to other non-financial firms. In view of the observed variations in credit volumes and interest rates throughout the cycle, one would expect the true impact to lay on the lower bound of this range. In any case, using a semi-elasticity of 3.3% (weighted average of 1.6% and 5%) the effect of a €10bn capital increase would be a reduction of the level of outstanding loans of 0.4%.

constraints. In addition, legal constraints prevent them also from issuing instruments with a potentially similar appeal to investors.

- Second, we expect that some institutions might resist recapitalizing, due to the dilution it supposes for current shareholders. From a certain level onwards, shareholders might prefer to restrict credit, the other alternative to fill the remaining capital shortfall, rather than to be diluted in an excessive manner. This might be especially relevant for Savings Banks in the hypothetical case that a reform of their institutional status allows them to access capital markets in a competitive manner.
- Third, even though a coordinated price increase of this magnitude could be feasible, it would only be sustainable if CIs were fairly homogeneous. Otherwise, those institutions with less capital needs or with lower costs would be able to offer lower prices and increase their market share. Spanish CIs are quite heterogeneous in terms of ownership structure, size and business strategies and, the longer the period to adjust to Basel requirements the more heterogeneous they will become.

Reduction of on-balance-sheet credit

- **Securitization:** One obvious solution would be to reduce the amount of credit on the balance sheet and hence RWA via securitization (with risk transfer) of parts of the credit portfolio. However, we see numerous limitations to this:
  - First and most importantly, the market for securitization and the model of "originate and distribute" was at the heart of the last financial crisis. It cannot be the purpose of the regulator to rely on the transparency and well functioning of this market in order to fulfil the new capital requirements imposed.
  - The market for securitization with risk transfer is expected to recover only with significant delay (the first market to recover should be the covered bond market which is still subject to disruptions) and is not expected to be sufficiently deep to absorb the large supply potentially created by European financial institutions. Indeed, those loans most likely to be accepted by the market are precisely those with the lowest risk-weighting (high quality mortgages). Therefore, were Spanish CIs seeking to free up

€1 bn of regulatory capital, for instance, they would need to issue €32 bn of those securities[14]. This large supply will be even more difficult to absorb if, as expected, the investment of financial institutions in securities other than public debt is discouraged by the new regulations.

- **Restrictions on the supply of credit to the economy.** This measure would decrease total RWAs and thus reduce the regulatory capital needed to satisfy the new solvency ratios. However, this is a very costly measure from the point of view both of a single financial institution and the economy as a whole. Not only has such a restriction an instantaneous effect on market shares, but it also results in permanent effects due to the existence of significant switching costs and a strong reputational damage. Hence, we estimate that Spanish CIs would only resort to such a measure in case their access to capital markets was completely foreclosed. We expect these restrictions to be implemented via a rationing of credits with higher weighting in terms of RWAs (consumer loans and unsecured lending to SMEs) or credits with lower internal ratings. Moreover, these restrictions could be implemented long before the entry into force of the new regulatory framework if CIs anticipate an extremely costly access to capital markets. We do not expect, however, this rationing to translate into a large and indiscriminate price increase. To see why, notice first that an indiscriminated price increase to the average borrower would trigger the undesired effect of adverse selection: the least risky borrowers might look for alternatives (e.g. market finance or international banking institutions). In order to minimize this adverse selection problem, CIs offer different prices to their clients according to the risk of their projects. However, and as already discussed on page 12, even the rise of risk-adjusted margins would be constrained by competition arising from those CIs with less capital needs or with lower costs.

[14] Given a risk weighting of 35% of residential mortgages under Basel II rules and a target core capital ratio of 9%, residential mortgages need to decline by 1/(35%*9%) = €32 bn in order to free up capital of €1 bn.

3 Liquidity Requirements

3.1 Estimation of the liquidity shock to the Spanish Banking System

The Basel Committee proposes two new liquidity coefficients: the Liquidity Coverage Ratio (LCR, with a time horizon of 1 month) and the Net Stable Funding Ratio (NSFR, time horizon: 1 year). Based on a preliminary assessment, the NSFR seems to be by far more demanding in terms of its impact on additional funding needs. We hence focus on estimating the NSFR in order to derive the impact of the new liquidity requirements.[15]

Based on the public balance sheets for the Spanish Banking System (Banks and Savings Banks)[16] at the end of 2009, and additional information about the term structure of assets and liabilities, we estimate the NSFR ratio to be at a level of 80%, well below the 100% required by regulators. This would give rise to a need for additional stable funding of approximately €440 bn. Some analysts[17] expect the market to require the built-up of liquidity buffers and demand NSFR levels of up to 130%. This would increase the stable funding need to up to 1,100€ bn.! The size of this buffer will depend on the way the regulator treats any violation of the 100%-requirement. They might, for instance, use a target level of 100% and trigger regulatory action not before institutions fall below a level of, say, 90%. In the present document we assume a target level of 100%. However, one has to keep in mind that any implicit market requirement above this level might have very severe consequences on the economy.

There are many limitations to this analysis on the basis of publicly available information – due to the lack of information on the exact term structure of assets and liabilities, the segmentation into different types of instruments and business segments on a system wide level and the many questions the current version of the regulatory proposals leaves unanswered. We derive a proxy of the potential error by comparing our estimation based on public information with internal estimations

[15] Details on the assumptions and computations of the liquidity shock to the Spanish Banking System can be found in Appendix 2.

[16] Due to data availability, the estimation of liquidity requirements excludes credit cooperatives and specialised financial institutions. Nevertheless, these two categories of institutions account for less than 8% of Spanish CIs' total assets.

[17] See, for example, J.P. Morgan, "Global Banks – Too Big to Fail? Running the Numbers", p.29.

of our own institution and adjust for this effect when estimating the overall stable funding need.

In order to assess the impact of this potential lack of funding one needs to take into account that the period until the entry into force of the new framework will be characterized by a relatively weak growth of credit and a somewhat stronger growth of retail deposits. Our projections in a baseline scenario for the Spanish market indicate that this differential evolution could reduce stable funding needs by €139 bn. in the three years 2010-2012. This estimate for the next three years compares to an observed stable funding creation of €59 bn in 2009. We hence estimate that the resulting liquidity gap amounts to €300 bn by 2012.

3.2 Banking institutions' reaction to the shock

As in the case for capital requirements, credit institutions could take several actions to improve their liquidity position and we can assume they would first resort to the least costly among them. Some of these actions overlap with those that could be taken to satisfy the new capital requirements. Others are completely independent. For the sake of exposition, we discuss all of them in this section and leave the assessment of the possible overlaps to the next section, in which several scenarios will be discussed.

A first package of actions would involve **adjustments to assets and liabilities of Spanish CIs:**

- **Reorganization of the non-credit asset portfolio** in order to reduce the required stable funding (RSF). This involves the same steps as for capital requirements (sale of 30% of acquired and repossessed real-estate assets, sale-and-lease-back of 30% of branch offices, sale of 30% of non strategic equity holdings), which would lead to a cut of €37 bn in RSF.
- **Additional adjustments to the asset portfolio:** RSF can be further reduced if CIs engage in several forms of asset substitution towards those with lower weightings.
  - Disposal of corporate debt (and substitution by public debt): high quality corporate debt with maturity over 1 year has a weighting of 20% for RSF, while public debt weighs 5%. Assuming CIs substitute half of

their portfolio of corporate debt of €120 bn for public debt, RSF would decrease in €9 bn.

- Reduce loan maturities: with the new regulations, loans with a maturity of less than a year have a weighting in terms of required funding below 100% (85% for loans to households, 50% for loans to firms). In 2009, we estimate that this kind of loans represented approx. 21% of the loan portfolio. This percentage can only be increased by reducing the maturity of new loans to the private sector, at the social cost of providing a less stable source of funding for firms and households and partially renouncing to the fundamental function of the financial sector: maturity transformation. Thus, we expect this measure to be hard to implement and assume that this percentage would increase only to 25%. In that case, RSF would decrease by €31 bn.

- **Reorganization of CIs' liabilities** in order to increase the available stable funding (ASF). Several steps can be taken:

  - Re-intermediation of off-balance sheet liabilities: By the end of 2009, the Spanish private non-financial sector held €262 bn in shares of non-financial corporations, €152 bn in mutual funds and €104 bn in other securities. We expect CIs to try to re-intermediate part of these resources by offering highly remunerated banking deposits (with ASF weight of 70%). Given that bank deposits are imperfect substitutes of these financial products we assume a relatively conservative re-intermediation ratio of 20% for investment funds and 10% for other securities. We consider that the balance of shares held are not available for re-intermediation as they are probably mostly held by firms (strategic holdings) or more sophisticated private investors not willing to substitute them with term deposits. These assumptions would lead to an increase of ASF of €28 bn.

  - Increase the stability of long-term retail funding in terms of ASF: The weighting of long-term retail deposits in ASF could be raised to 100% either by including a significant cancellation fee or by substituting them for CIs' bonds (such as commercial paper). By the end of 2009, we estimate that long-term retail deposits amounted to €249 bn with an average weighting in ASF of 79%. Assuming that 20% of this stock could

be substituted by CIs' bonds, ASF would increase by €10 bn.

Liquidity: adjustments to assets and liabilities *(eur bn.)*	
Sale of acquired or repossesed real-estate assets	15
Sale and lease back of branch offices	10
Divestiture of assets with high risk weighting	12
Disposal of corporate debt	9
Reduce loan maturities	31
Re-intermediation of off-balace sheet liabilities	28
Increase stability of long-term retail funding	10
Total adjustments	**115**

Overview of assumed CI's reaction to liquidity regulation

In sum, significant adjustments to both assets and liabilities could cover around €115 bn of Spanish CIs' liquidity requirements.

Cost of balance sheet optimization: The cost of these additional measures would need to be recovered through an increase in the price of loans in order to maintain the RoE constant (comparable to the argument developed when analysing the effect of recapitalization on loan supply). However, the effect on credit outstanding is expected to be negligible. An additional cost of 100 basis points of these measures would have to be compensated by an increase of the pre-tax operating margin by €1.6 bn. Using the same assumptions on price-sensitivity of loan demand as above, this would result in an effect on the aggregate level of outstanding credit of 0.3%.

After these adjustments, Spanish CIs would still face a regulatory stable funding gap of around €185 bn. Similar to the case of reacting to the more severe capital requirements, CIs will have again two alternatives to cover the shortfall: new debt issuances or credit restrictions. Notice, however, that any measure of recapitalization or credit restriction already taken to restore solvency ratios would reduce this remaining stable funding gap and need to be taken into account in an integrated analysis.

- **Issue new debt in international markets:** ASF could be increased by issuing new long-term debt. Given the already large amount of debt that needs to be rolled over in the upcoming years (estimated at almost €300

bn 2010 – 2012), the feasibility of increasing issuances over this amount will depend on the stress remaining in debt markets. The fact that investments of financial institutions in securities other than public debt are discouraged by the current proposal might jeopardize the rollover of maturing debt and will heavily restrict the capacity for additional issuances. In terms of cost, the prevailing conditions seem to be such that demand for CIs' debt is fairly elastic for spreads up to 120 – 150 bp. Demand appears to become inelastic above this value, as larger spreads are interpreted as a sign of weakness of the institution. We thus assume that any additional issuance of debt would be carried out at this cost. Again, the cost of the issuance would need to be recovered through an increase in the price of loans in order to maintain the RoE at constant levels.

- **Restrictions on the supply of credit to the economy.** This measure would also decrease total RSFs needed to satisfy the new liquidity ratios. Given our estimate of an average RSF weight of 92% of credit outstanding, every euro of less credit supply will improve stable funding by 92 cents. However, as mentioned before, this measure is very costly for CIs individually and for the economy as a whole and we assume it would only be implemented in case debt markets were foreclosed to Spanish CIs.

4 Macroeconomic Impact. Possible Alternative Scenarios

As the development of this last financial crisis has made evident, difficulties in the banking system are transmitted to the real economy through alterations in the credit supply to the private sector. Indeed, there is a growing body of formal evidence showing that credit institutions decrease the supply of loans in response to an exogenous shock (i.e. a tighter monetary policy) that lowers their liquidity or capital holdings[18]. However, the literature that tries to quantify the effects on GDP of a credit supply shock is still scarce given the practical difficulty in disentangling

[18] See ECB (2008) and the references cited therein for a comprehensive review of the role of banks in monetary policy transmission and, in particular, for a description of the so-called "bank lending channel".

changes caused by demand or supply[19]. Still, the results point to a higher impact on GDP for the Euro Area than for the US, probably because in the EU most of the funding available to firms is intermediated through credit institutions. The most recent study available for the EU was published by the ECB[20]. It finds that a one-shot quarter-on-quarter 5% reduction in credit supply has a cumulated medium term effect on GDP of -1.6%[21]. Nevertheless, since it only uses data prior to the current crisis, it is possible that these figures underestimate the true impact caused by credit reductions of an exceptional magnitude and nature during periods of stress.

In any case, the figures provided by the ECB can be used to approximate the order of magnitude of the macroeconomic consequences of the new regulatory framework. To this end, we consider three possible scenarios reflecting different degrees of stress remaining in capital and debt markets during the upcoming years. For each of them, we provide an estimate of the associated reduction in outstanding credit and translate it into points of GDP growth using the ECB's estimated elasticity.

4.1 Most likely scenario: Limited access to capital markets

Under this scenario, Spanish CIs successfully reorganize their asset portfolio, reducing capital requirements by about €12.1 bn. We assume that since the Spanish financial system is fundamentally sound and is being reinforced by a consolidation process, investors are willing to increase their capital position in Spanish CIs at a reasonable price. Nevertheless, we assume that **only 50% of the remaining capital needs can be covered through the issuance of new capital instruments.** This assumption can be supported by several considerations. First, savings banks represent half of the Spanish financial system and have very limited access to capital markets under present conditions. Second, even if access could be improved, full recapitalization would face a strong opposition by existing shareholders (of both banks and savings banks), who would experience a significant dilution. Finally, this assumption would also be consistent with a tight transition period to the new framework.

According to this scenario, €17.8 bn could be raised in capital markets at a price of

[19] See Discroll (2004) and Ashcraft (2006) for evidence regarding the US. For the EU, see Cappiello et al (2010), Cihák and Brooks (2009) and Gerali et al (2010).

[20] Cappiello et al (2010).

[21] Using a similar methodology but fewer observations, Cihák and Brooks (2009) find an effect on GDP of only -0.4% after a one-shot quarter-on-quarter 5% reduction in credit supply.

9%. In order to be able to remunerate this additional capital, an increase of pre-tax credit margins of €2.3 bn (or 22 b.p. of new credit) would be necessary. Using the estimates detailed above (see page 11 in section 2.2) this might reduce credit by 0.4%.

Additionally, another €17.8 bn of capital shortfall would still need to be covered through reductions in RWAs. We assume that securitization of existing loans is not feasible for the abovementioned reasons (legal and supervisory constraints, lack of market depth). There would hence still be some necessary restriction in the credit supply in order reach the target capital level. According to our estimations, RWA should diminish by 10% (€196 bn) to ensure a core capital ratio of 9.1% in 2012. Given that only 72% of the Spanish RWAs are credit related, and assuming a symmetric reduction in all kinds of credit, this would imply a **reduction in the credit outstanding by 2012 of €272 bn, or 14%** with respect to our baseline projections of credit outstanding to the private resident sector in 2012 (without regulatory change)[22]. The reduction of RWAs could also be achieved by a decrease of those loans with higher risk-weighting. However, the required credit reduction would be of a similar magnitude but concentrated on the SME segment and, thus, with even worse implications for GDP growth. Note that this supply-side rationing of credit is the binding constraint and dominates the above mentioned effect of -0.4% on credit of a general price increase (parallel shift of the supply curve).

As for liquidity requirements, we estimate that the actions taken to restore core capital ratios would reduce required stable funding by €283.5 bn (€36.9 bn due to the asset reorganization, €17.8 bn due to the recapitalization and €228.8 bn due to the credit reduction). This would leave still a regulatory stable funding gap of €17.2 bn to be covered. Spanish CIs could then opt either for an adjustment in their assets and liabilities as described above or for the issuance of additional debt instruments, whichever the less expensive. In any case, the effect of the associated price increase in new loans due to both these adjustments and the recapitalization would be dominated by the rationing of credit supply required to restore solvency levels.

[22]This rationing of credit is supposed to be implemented via the exclusion of the most risky borrowers and not via price (see page 13 in section 2.2).

Under this most likely scenario, outstanding credit in 2012 would drop by 14%. This would lead to a cumulated 5% reduction of GDP in the medium term[23].

These results are in line with those obtained by the Fédération Bancaire de France (FBF) for the Euro Zone. In their response to the consultative documents of the BCBS, they estimate a credit reduction of 20% with a long term effect on GDP levels of -6.5%.

4.2 Best Case Scenario: Full access to capital and partial access to debt markets

Under this scenario both capital and covered bond markets are supposed to function properly without stress. Hence, they are assumed to be deep enough to satisfy all the needs of Spanish CIs. As a consequence, they would be able to raise all the regulatory capital. Solvency levels could be restored without the necessity of reducing outstanding credit levels and the sole effect on credit would be due to the associated price increase in new loans.

Given that solvency requirements could be covered without resorting to credit reductions, the regulatory stable funding gap would still be considerable. The reorganization of assets, the recapitalization and the additional adjustments to assets and liabilities could generate a total of €142.6 bn, leaving still another €158 bn to be covered through debt issuances before 2012. In other words, Spanish CIs would need to increase their current level of long term outstanding debt a further 24%.

Even though under this scenario there is no need for restrictions in the credit supply, all the measures taken by CIs to comply with solvency and liquidity requirements would have an effect on the price of new loans that would reduce the equilibrium level of credit. We estimate that Spanish CIs would need to increase prices in 89 b.p., leading to a decrease of outstanding credit in 2012 of around 1.4%.

Nevertheless, in our opinion such an increase in debt issuances is not likely to be absorbable by debt markets even under normal circumstances. Given the already

[23]The credit shock consists of 12 consecutive quarters of a 1.25% quarter on quarter decline in credit growth and of a 0% growth thereafter. The effect on GDP is then computed using Cappiello et al. estimated relationship: $\Delta y_{it} = 0.456\Delta y_{it-1} + 0.322\Delta y_{it-2} + 0.077\Delta l_{it}$ (where Δy stands for GDP growth and Δl for credit growth)

large amount of outstanding debt issued by Spanish CIs and the expected vast debt offer arising from the rest of CIs in the Eurozone, it seems implausible that investors wish to increase their exposure to a single sector of a single country. Thus, we take a more conservative approach and assume that only 50% of the remaining stable funding gap could be covered through debt issuances. There hence remains a need to generate €79 bn of stable funding through a restriction of credit supply. Given our estimate of an average RSF weight of 92% of credit outstanding, every euro of less credit supply will improve stable funding by 92 cents. Credit supply therefore needs to be restricted by €86 bn, **equivalent to 5% of our baseline projection of credit outstanding to the private resident sector in 2012**.

Under this scenario, outstanding credit in 2012 would drop by 5%. This would lead to a cumulated 1.6% reduction of GDP in the medium term.

4.3 Worst Case Scenario: Inaction and no access to capital or debt markets

For the sake of completeness we describe as well how a worst case scenario might develop, even though we consider it highly unlikely. Under this worst-case scenario, the stress level in capital markets would be such that investors would be unwilling to increase their exposure to Spanish CIs. Securitization of existing loans would not be feasible. Furthermore, Spanish CIs would fail to make any of the proposed reorganizations and adjustments to assets and liabilities. A premature implementation of the proposed rules - either forced by regulators or pressed by the market - would increase the likelihood of this adverse scenario. In that case, CIs might not be able to sale assets without triggering a fire sale and capital markets might not have time to collect enough information to identify fundamentally sound CIs.

In such a scenario, the only way to restore core capital ratios to the desired level is through a very significant reduction in the risk-weighted assets, and hence, the level of credit outstanding. The prospects of such an scenario, however, are so negative that we are convinced it will not be reached in equilibrium. Instead, additional reforms to the current framework would be undertaken once the severity of the situation was recognized.

4.4 Other macroeconomic impacts

The necessary recapitalization and additional funding to be raised in international capital markets by credit institutions will lead to a certain "crowding out" effect: resources might be diverted away from other, more efficient uses, e.g. financing other sectors of the real economy. This might have an additional first-order effect on GDP growth, especially in the current environment where capital is a scarce resource.

5 Impact on Monetary Policy, Banking Business and Products

5.1 Monetary policy

As described above, the introduction of the new capital requirements might lead to a necessary increase of the net interest margin of up to 89 basis points (in order to maintain current RoE in a case where markets for funding and capital can entirely absorb the increase in requirements) and therefore raise the cost of financial intermediation. This might affect the banking channel of monetary policy and reduce the effectiveness of monetary policy via interest rates (at least in response to negative output shocks as it increases the lower bound of market interest rates).

On the other hand the new liquidity requirements will act similarly to an increase in reserve requirements: for each unit of deposits captured only 0.70-0.85 units of credit can be originated. This will significantly impact in the steady-state level of the banking multiplier and require an adjustment period for monetary policy.

5.2 Banking business and products

An implementation of the proposals in its current form might trigger corrective actions by the banking industry in order to mitigate the overall impact, as described above.

The main result of this is most probably a **substitution of the role of financial intermediation and maturity transformation of banks by markets.** There might be a lot of political pressure to restore in the well functioning of securitization

markets in order to ease the regulatory pressure for the banking system both from capital and liquidity requirements and hence limit the impact on loan volume and GDP growth. This might have perverse effects, as the recent financial crisis has made evident: markets tend to be more volatile and more prone to create snowball effects of crises transmission mechanisms. Moreover, they do neither count with comparable capital and liquidity buffers nor have access to the lender-of-last-resort function of the central banks. The result could be a less stable instead of a more robust financial system.

The following summarizes some of the probable adjustments and illustrates the potential negative effects:

- **Substitution of CIs' off-balance sheet liabilities** (investment funds, pension funds, term life insurance, direct equity holdings) with traditional or structured deposits. CIs will be discouraged to offer retirement savings products in order to comply with the new requirements. The expected reduction in the volume of these products will slow down the current tendency to move retirement planning into the private sector[24].

- The current design of the liquidity ratios is likely to effectively lead to a **"reverse transformation":** short term loans need to be financed with long term liabilities. The result would be pressure to reduce maturities of loans. This will especially hurt durable-goods consumer financing and favour products such as mortgages with lower maturities and final balloon payment.

- There is strong pressure to **reduce all types of equity investments** both from changes in capital requirements and the new liquidity ratios. This includes not only short-term, speculative holdings but also long-term, strategic holdings in both financial and non-financial subsidiaries. This will hurt international cooperation between credit institutions, stepwise internationalization processes and the role of credit institutions as stable stockholders in key industries in some countries.

[24]This reintermediation of CI's off-balance sheet liabilities will have to be pursued despite the general movement towards credit disintermediation. We expect other financial institutions outside the scope of new regulations (e.g. independent insurance companies) to use the development of disintermediated investment opportunities to offer retirement savings products that will compete for those same savings that CIs wish to reintermediate. Nevertheless, CIs' currently have a large market share of retirement savings and we expect them to convince a significant number of their clients to move into deposits.

- There will be a tendency to monetize fixed assets, such as **real-estate**. This might put further pressure on the already stressed real estate markets in some countries.

- **Bank-firm relationship:** there is an asymmetry in the treatment of loans and debt instruments with maturity of less than one year: loans still have a charge of 50% (85% in case of SMEs) for required funding whereas debt instruments are charged a 0% funding requirement. This might incentivize banks to finance companies via marketable debt instruments instead of loans, weakening the bank-firm relationship. This is especially relevant in a European context with a strong relationship between banks and companies and less developed capital markets.

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Appendix 1: Capital Regulation

Capital Proposals
i. Minimum overall levels, Tier 1, Tier 2 and Tier 3 capital:
1 Total capital requirements will be revised if any adjustment is decided to be required based on an impact study to be conducted in the first half of 2010. Tier 1 will be modified as described below, with the level also to be recalibrated after the impact study
2 Tier 2 will be harmonized.
3 Tier 3 capital (currently available to cover market risk requirements) will be eliminated.
ii. Composition/definition of capital:
1 Total capital, Tier 1 and the common equity component of Tier 1 minima will be formulated (not yet specified, subject to impact study). Restriction that Tier 2 cannot exceed Tier 1 will be removed.
2 "Predominant" (exact percentage to be defined after the impact study) form of Tier 1 must be common shares and retained earnings.
3 Deductions from capital and prudential filters are to be harmonized. Among others, the main features are:
a. Minority interests will not be eligible for inclusion in the common equity component of Tier 1.
b. Unrealized gains and losses should not be removed from the common equity component of Tier 1.
c. Goodwill and other intangibles should be removed from common equity.
d. Deferred tax assets which rely on future profitability of the bank should be removed from common equity (tax assets not relying on future profitability should be assigned the relevant sovereign risk weighting).
e. Banks' investments in own shares should be deducted from common equity.
f. Holdings of capital which form part of a reciprocal cross holding agreement are to be deducted in full.
g. Deductions from capital in respect of a shortfall of provisions to expected losses under the IRB approach should be made 100% from common equity.
h. Gains and losses due to changes in own credit risk on fair value financial liabilities will be filtered out of common equity.
4 Reminder of Tier 1 must be comprised of instruments that are subordinated, have fully discretionary non-cumulative dividends or coupons and have neither a maturity date nor an incentive to redeem.
5 Innovative hybrid instruments with an incentive to redeem (currently limited to 15% of Tier 1) will be phased out.
6 Tier 2 capital instruments must be subordinated to depositors and general creditors and have an original maturity of at least 5 years. Recognition as regulatory capital will be amortized during the final 5 years of maturity.
7 Role of contingent and convertible capital instruments will continue to be reviewed and new proposals will be issued in July 2010.
8 Grandfathering of instruments issued before the publication of the consultative document. Specific grandfathering period to be determined based on impact study.

Note: Other capital proposals under consideration deal with counterparty risk, leverage ratios and counter-cyclical measures.

Source: The Institute of International Finance. Briefing Note - Basel II Reform Package, December 2009.

New capital requirements for Spanish credit institutions

Impact of the new capital proposals on the Spanish banking system
Data as of 12/2009

	€ Milions	Change in pp (2009)
Stakes related deductions[1]	-15,712	-0.76
Minority interests	-11,524	-0.56
Deferred tax assets[2]	-8,283	-0.40
Potential losses above provisions[3]	-12,217	-0.59
Total adjustments in Core Capital	**-47,735**	**-2.31**

Risk-weighted assets (€ milions)	**2,063,590**
Core capital ex-ante (BIS II) (€ milions)	**167,151**
In %	**8.1%**
Core capital ex-post (BIS III) (€ milions)	**119,416**
In %	**5.8%**

[1] Deduction of 100% of Solvency I requirements of insurance subsidiaries (stakes>20%) and 100% of banking investments (stakes > 10% and < 50%). This does not include an estimate of the impact of substituting the deduction of Solvency I requirements of insurance companies with the deduction of the whole investment as proposed by the Committee.

[2] Deferred tax assets not associated with generic provisions and pension provisions (estimated as 25% of total deferred tax assets)

[3] Estimated as current excess stock of provisions over expected losses minus generic provisions (i.e. current shortfall of specific provisions vs expected losses)

Note: We restrict our analysis to these four elements as we consider them the most relevant. We omit the potential impact of several rules which we estimate of minor importance for the Spanish banking system. These include the deduction of pension deficits, the impact on risk-weighted assets through higher capital requirements for trading book and complex securitisation exposures, counterparty credit exposures arising from banks' derivatives and repo and securities financing activities.

Source: own calculations based on Bank of Spain data.

Appendix 2: Liquidity regulation

Summary of Net Stable Funding Ratio

Available Stable Funding (Sources)		Required Stable Funding (Uses)	
Item	**Availability Factor**	**Item**	**Required Factor**
• Tier 1 & 2 Capital Instruments • Other preferred shares and capital instruments in excess of Tier 2 allowable amount having an effective maturity of one year or greater • Other liabilities with an effective maturity of 1 year or greater	100%	• Cash • Short-term unsecured actively-traded instruments (< 1 yr) • Securities with exactly offsetting reverse repo • Securities with remaining maturity < 1 yr • Non-renewable loans to financials with remaining maturity < 1 yr	0%
• Less stable deposits of retail and small business customers (non-maturity or residual maturity < 1yr)	85%	• Debt issued or guaranteed by sovereigns, central banks, BIS, IMF, EC, non-central government, multilateral development banks	5%
• Less stable deposits of retail and small business customers (non-maturity or residual maturity < 1yr)	70%	• Unencumbered non-financial senior unsecured corporate bonds (or covered bonds) rated at least AA, maturity ≥ 1 yr	20%
• Wholesale funding provided by non-financial corporate customers (non-maturity or residual maturity < 1yr)	50%	• Unencumbered listed equity securities or non-financial senior unsecured corporate bonds (or covered bonds) rated at least A-, maturity ≥ 1 yr • Gold • Loans to non-financial corporate clients having a maturity < 1 yr	50%
• All other liabilities and equity not included above	0%	• Loans to retail clients having a maturity < 1 yr	85%
		• All other assets	100%
		Off Balance Sheet Exposures	
		• Undrawn amount of committed credit and liquidity facilities	10%
		• Other contingent obligations	National Supervisory Discretion

Source: Basel Committee on Banking Supervision (2009a), Annex 3.

New liquidity requirements for the Spanish credit institutions

Available stable funding (ASF)

Billion €	*Weight*	*Financial System, Outstanding amount 31/12/09*	*ASF*
Regulatory capital (Consolidated)	**100%**	**240**	**240**
Liabilities with maturity >1year	***100%***	***718***	**718**
Central Banks		11	
Retail funding (other than diposits)		54	
Financial entities		193	
Debt issuances		396	
Corporates		56	
Public entities		8	
Stable retail diposits	***85%***	**632**	**538**
Non stable retail diposits	**70%**	**281**	**196**
Stable SME diposits	**85%**	**35**	**30**
Non stable SME diposits	**70%**	**161**	**113**
Wholesale funding , maturity <1year	**50%**	**85**	**43**
Corporates		13	
Public entities		72	
Other liabilities with maturity <1year	**0%**	**433**	**0**
Central Banks		99	
Retail funding (other than diposits)		13	
Financial entities		216	
Debt issuances		104	
Other liabilities			
(trading and hedging derivatives , allowances, tax liabilities , and others).	**0%**	**364**	**0**
Total			1,877
Adjustment factor ASF*			92%
Total Available Stable Funding			**1,731**

* Due to the limitations of public information on both maturities and segmentations, we use an adjustment factor to correct the estimations based on public figures. This factor is calculated based on internal data of our own institution, where greater detail on both maturities and segmentation is available.

Required stable funding (RSF)

Billion €	*Weight*	*Financial System, Outstanding amount 31/12/09*	*RSF*
Cash and securities <1year	**0%**	**60**	**0**
Cash		47	
Securities <1year		14	
Interbank <1year	**0%**	**216**	**0**
Public and private debt, maturity <1year	**0%**	**83**	**0**
Unencumbered public debt		22	
Guaranteed debt		4	
Non guaranteed financial debt		20	
Other non financial debt		36	
Public and guaranteed debt, maturity >1year	**5%**	**108**	**5**
Unencumbered public debt		95	
Guaranteed debt		13	
Non financial private debt,with maturity >1year	**20%**	**164**	**33**
Equities	**50%**	**156**	**78**
Equities available for sale		63	
Trading derivatives		93	
Credits to non financial clients, maturity <1year	**50%**	**278**	**139**
Credit to public entities		19	
Credit to firms		259	
Credits to retail clients , maturity <1year	**85%**	**97**	**82**
Other assets not included in previous categories	**100%**	**1,587**	**1,587**
Total			1,925
Adjustment factor RSF*			107%
Contingent claims	20%	652	130
Adjustment factor contingent claims*			80%
Total Required Stable Funding considering contingent claims			**2,173**

Net Stable Funding Ratio

Liquidity shortfall (RSF-ASF)	**442**
NSFR Ratio (ASF/RSF)	**80%**

* Due to the limitations of public information on both maturities and segmentations, we use an adjustment factor to correct the estimations based on public figures. This factor is calculated based on internal data of our own institution, where greater detail on both maturities and segmentation is available.

Note: Estimations based on unconsolidated balance sheet data

Source: Spanish Banking Association and Association of Spanish Savings Banks.