



EUROPEAN CENTRAL BANK
EUROSYSTEM

The impact of the CRR and CRD IV on bank financing

Eurosystem response to the DG
FISMA consultation paper

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General remarks

The ECB considers the adoption of the Capital Requirements Regulation and Directive (CRR/CRD IV) to be a major achievement. This important legislation is playing a key role in strengthening the resilience of the EU banking sector, restoring market confidence and providing a level playing field for the banking industry. First and foremost, the increases in the quality and quantity of capital conferred by the legislation were a necessary correction of the weak capital standards that existed pre-crisis. Furthermore, the harmonised application of prudential rules in all EU Member States is paramount for ensuring financial stability and strengthening financial integration in Europe. In addition, the legislation provides important new mechanisms to allow macroprudential authorities the flexibility to implement measures aimed at mitigating systemic risks.

Overall, the ECB remains strongly supportive of the additional capital requirements introduced in the CRR/CRD IV, as the evidence clearly indicates that a substantial capital increase above previous levels was necessary and desirable. The Commission's own analysis¹ in the consultation document accurately highlights important elements of the rationale and benefits of robust capital requirements. This includes reducing bank moral hazard and thereby improving the quality of lending decisions; increasing banks' ability to lend *through the cycle*; and insulating taxpayers and society from having to bear banks' unexpected losses. The CRR/CRD IV package was an important step forward in correcting the suboptimal capital regulation that existed before the crisis – and thereby ensuring these benefits are recognised.

It is important to appropriately acknowledge the significant long-run welfare gains of strong capital requirements and the role that a healthy and resilient banking system plays in facilitating growth over the whole financial cycle. This conclusion is reached by comparing results from different strands of the macroeconomic literature, including empirical as well as applied theoretical work (see review in Annex 1). It is however important to stress that this literature is still relatively new and that many of the studies that are included in this review are still work in progress.

At this early point after the implementation of the CRR/CRD IV rules, it is difficult to come to firm conclusions about their impact on the financing of the real economy. This is especially true given the other significant influences on banks' capital levels that have been in evidence during this period – notably from government intervention, supervisory action, and market pressures. In addition, the magnitude of the impact also depends on the level and quality of the capital before CRR/CRD IV implementation, which show a high level of heterogeneity among individual countries. Nonetheless, in this response, the ECB has sought to answer the questions posed at this early point, focusing on the relevant available analysis

¹ For example, in section 4.1 of the Annex to the consultation document.

that explains what the likely impacts of additional capital requirements are, in both the transition phase and the steady state. In this regard, it needs to be highlighted that in addition to possible supply-side constraints, lending volumes are also influenced by demand-side factors that are affected by the macroeconomic environment. This adds to the difficulties in disentangling the sources of influences on banks' lending activity.

Reaping long-term benefits can only be achieved by assuming temporary costs that emerge in the transition period. In analysing costs, it is therefore important to distinguish between the transition and steady-state impact of higher capital requirements. The costs associated with the transition to increased capital requirements are not relevant in the steady state. However, the evidence of costs associated with transitioning to a regime with higher capital requirements suggests that the new requirements should be phased in to allow (i) banks to generate the necessary additional capital from retained earnings, (ii) markets to absorb new capital issuances, and (iii) banks to change their business models or portfolio composition. This has indeed been the case when the phasing-in requirements have been defined, in line with the Basel III implementation schedule. In this regard, it should also be noted that market or supervisory pressure to front-load the phase-in arrangements may pose challenges for certain institutions in meeting the requirements well ahead of the planned phase-in schedule. However, given that the possible front-loading of measures is not a regulatory issue, it is not discussed separately in this document.

Empirical work carried out by the ECB on the impact of higher bank capital requirements on the euro area economy identifies some adverse impacts on loan supply, although this appears to be relatively limited in economic terms. This finding holds both at country and euro area level for different portfolio segments. Also, the analysis finds that the impact of CRR/CRD IV was greater for less capitalised banks and for banks with lower average risk weights. Lastly, banks with higher non-performing loan ratios (i.e. weak credit portfolios) were also relatively more severely affected by the CRR/CRD IV. The moderate impact of higher capital requirements on lending rates and GDP was also confirmed by a suite of Dynamic Stochastic General Equilibrium (DSGE) models that was used to calculate the steady state impact on euro area aggregate GDP.^{2,3}

While these costs mainly affect the economy in the short run, the benefits of the requirements can be seen as banks become more resilient due to the lower probability of default. This trade-off between the short-term costs and long-term benefits allows these studies to calculate an optimum capital requirement level. Overall, they find that the optimal minimum capital ratios lie between 12 and 16 per cent of risk weighted assets.⁴ However, other academic research has found much

² The models employed include Christiano et al. (2010), Gertler and Karadi (2011), Darracq et al. (2011), Angeloni and Faia (2013), Boissay et al. (2015), Clerc et al. (2015), Mendicino et al. (2015) and Darracq et al. (2015a-b).

³ It should also be borne in mind that the observed upward pressure on bank lending rates from the CRR/CRD IV package occurred at the time of a generalised downward trend in interest rates, thereby mitigating the negative impact on lending volumes and the real economy.

⁴ See Mendicino et al. (2015) and Clerc et al. (2015), respectively.

higher optimum requirements - of up to 25 per cent of total assets or higher in some cases.^{5,6}

Higher capital requirements can substantially reduce the probability of bank defaults and financial crises. In this regard, various studies find that even a moderate increase in the requirement, from 8% to 9% of risk weighted assets, would decrease the probability of bank defaults from 2% to 0.75% and the probability of a banking crisis from 3% to 1.9%.⁷ More importantly, reducing the probability of a crisis substantially decreases cumulative economic losses.

Overall, theoretical and empirical work both suggest that net positive effects will prevail in the long term – with adverse loan supply effects concentrated in a short-term transitional phase, as banks adjust to the new requirements.

Assessing the impact of regulations is essential, and regulators must continue to ensure that the benefits of regulatory intervention justify the costs. Looking ahead, it will be appropriate for the Commission to continually review the calibration of post-crisis regulations in order to maintain regulatory calibrations at levels that maximise net benefits to society. Such reviews should be holistic in scope – ensuring that the interactions between different strands of the regulatory architecture are captured.

⁵ Admati and Hellwig (2013),

⁶ N.B.: the new crisis management framework, especially the implementation of the Bank Recovery and Resolution Directive (BRRD) and the establishment of the Single Resolution Mechanism (SRM) could, in the future, reduce the costs of banks' failures to the economy and the financial system. In fact, the degree of market discipline is likely to increase due to the elimination of implicit government guarantees. Similarly, the migration of losses to the sovereign category, which amplified the macroeconomic impact of banking crises in the past, is expected to be reduced by the new crisis management framework. In this regard, the interaction of CRR/CRD IV and the BRRD/SRM as well as the impact on the optimal capital ratio needs to be further assessed.

⁷ See Clerc et al. (2015) and BIS (2010), respectively.

Specific comments

1 Capitalisation

The crisis demonstrated that changes needed to be made to the structure of banks' liabilities and funding – in order to address the excessive fragility that was revealed, and the problems that this fragility created. The CRR/CRD IV package was a prudent and proportionate approach to reframing expectations about appropriate bank capitalisation, which set standards that are in line with international practice. Notably, the capital requirements set out in the CRR and CRD IV are at the low end of academic and policy-makers' estimates of the socially optimal capital level.⁸ This backdrop sets the context for discussion on the impact of the CRR/CRD IV on bank lending and the associated European Commission work in this area. Specifically, it cautions against any temptation to use this exercise to make the case for lowering bank capital standards. Furthermore, it emphasises that any policy decisions on future changes to capital standards must consider the full array of costs and benefits generated by capital requirements and should therefore look beyond bank lending.

Isolating the effect of regulation

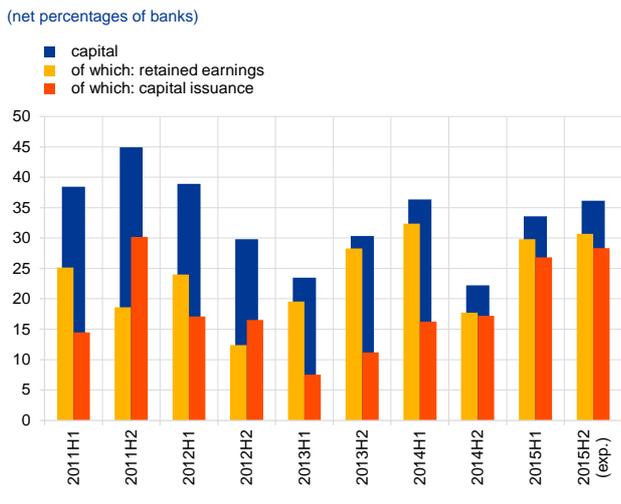
It is inherently difficult to isolate the impact of the CRR and CRD IV requirements on capital levels, especially given that many confounding events took place during the years in question, which each affected the dynamics of banks' capital structures. The wave of government interventions and supervisory actions in several EU countries had a large impact on the capital adequacy/solvency ratios of banks. There were also cases when government interventions and supervisory actions took place even before banks approached the minimum required level of capital. In these cases, interventions were made to support the credit activity of banks or to restore confidence in financial markets.

Supervisory stress tests at both European and national level have also helped strengthen the resilience of European banks. These include the EBA's EU-wide capital exercise in 2012 and the ECB's Comprehensive Assessment (CA) exercise (including the associated EBA stress test) in 2014. Since the announcement of the CA in July 2013, the participating banks have taken various measures, including raising capital of €60 billion, to strengthen their balance sheets by a total of more

⁸ For example, the quantitative cost-benefit analysis of capital requirements conducted by the BIS (e.g. BIS 2010) found that the net benefits of increasing capital ratios are positive for a broad range of values. Overall, the main conclusion of this study was that capital ratios were too low and that there was considerable scope to increase capital while generating positive net benefits. Similarly, using data from a wide range of countries over a period of almost 200 years, Miles, Yang and Marcheggiano (2012) conclude that bank capital should be around 20 per cent of risk-weighted assets. Beguenau (2014) finds the optimal capital requirement to be around 14%. Nguyen (2014) calibrates a model that gives an optimal capital requirement of 2 percentage points higher than the Tier 1 capital required by Basel III. Please see annex A for a more detailed overview of the relevant literature.

than €200 billion. As a result, euro area banks' common equity tier 1 (CET1) ratios reached 12.5% at end-2014. Box A below provides a short overview of the CA's impact on lending.

Chart 1
Impact of regulatory or supervisory actions on banks' capital



Source: Eurosystem's Bank Lending Survey. Notes: Net percentages are defined as the difference between the sum of the percentages for "increased considerably" and "increased somewhat" and the sum of the percentages for "decreased somewhat" and "decreased considerably".

The minimum regulatory capital requirements set by the CRR and CRD IV are often exceeded by banks, which implies that these requirements are not the only driver of banks' capital management decisions. In this regard, other external factors, such as the requirements set by credit rating agencies (CRAs) or market expectations, are also seen as important. Regarding the relative importance of the CRR and CRD IV requirements versus other factors, we note that credit ratings (targets) are also very important to regulatory capital requirements, at least for listed institutions. Furthermore, it can be seen that banks' internal capital adequacy assessment (ICAAP) models often set a capital level for banks substantially above minimum regulatory capital requirements.

Replies to the ECB's Bank Lending Survey (BLS) provide some context on how banks have recently strengthened their capital positions in response to the CRR/CRD IV and the CA. According to the replies, this increase was based on retained earnings and new

capital issuances, often with greater reliance on retained earnings (2013 and first half of 2014).

Securitisation – ensuring appropriate capital treatment

Since the crisis, securitisation has been under an extended regulatory review as a result of very large losses incurred by certain securitisation structures.

Losses incurred by structurally complex and opaque transactions such as re-securitisations significantly exceeded both market expectations and, for the banking framework, the regulatory capital required under Basel II and the CRD. Likewise, very significant losses were also observed on structures with very high underlying credit risk such as subprime residential mortgage-backed securities (RMBS). In many cases, the negative performance was magnified by deficiencies in the rating process and governance. At the same time, capital requirements proved to be adequate for certain segments of the market such as asset-backed commercial paper (ABS), (Chart 2) and covered bonds, which performed as expected even during the crisis.

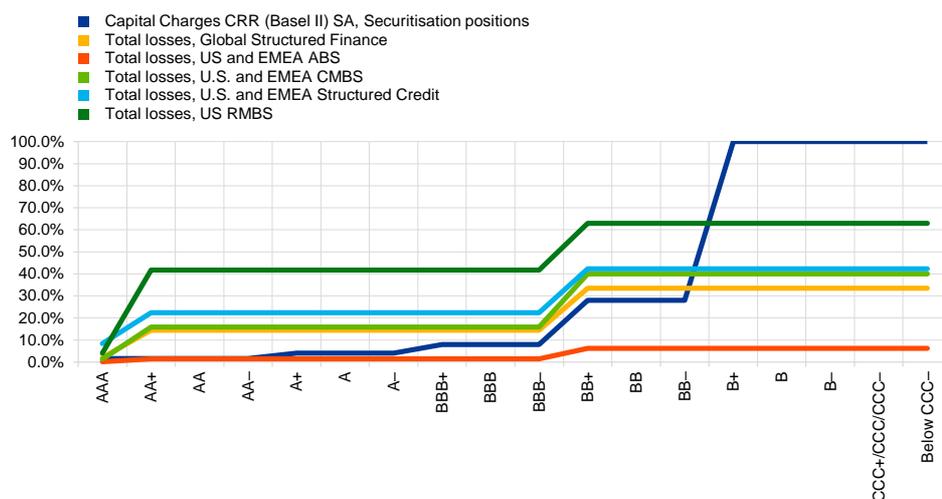
Therefore, when setting capital charges for securitisations, the aggregate loss performance of structured finance needs to be interpreted with caution, considering the very high heterogeneity of securitisation markets.

Consequently, a fundamental lesson from the crisis is that the "one size fits all"

approach to securitisation capital requirements under Basel II and the CRD was not optimal in coping with highly diverse securitisation structures. Another lesson was that neither capital requirements nor external ratings can replace investor due diligence and cannot address systemic governance and transparency issues; these need to be addressed separately.

Chart 2

Comparison of the CRD (implementing Basel II) securitisation capital charges under the standardised approach (SA) and total losses incurred by selected securitisation asset classes between 2000 and 2014



Note: Data from Fitch Global Structured Finance Losses (2000-2014 Issuance) and ECB calculations. Global total losses are the lifetime (average) losses incurred by all tranches rated by Fitch between 2000-14, for all ratings, and are expressed as a % of the initial rated balance. Total loss includes both realised losses and Fitch's estimate of future losses. Capital charges and losses are represented as a % of notional. The losses shown in the chart are average losses for rating buckets (AAA, other IG, non-IG) where data was available over the 2000-14 period; as such losses incurred in some years, e.g. during the crisis, are higher than the average.

The regulatory reaction post-crisis was both to reduce the identified deficiencies of the Basel II framework by increasing the risk sensitivity of capital charges, and to enact measures to enhance governance and transparency. Regarding capital charges, the December 2014 revisions to the Basel securitisation framework introduced a number of significant enhancements, including a reduction in the mechanistic reliance on external ratings. Together with an increase in the risk sensitivity of the framework, the capital charges for highly-rated securitisation exposures were also significantly increased. The revised enhanced framework however did not consider the qualitative features of securitisations among its risk drivers. Consequently, while introducing significant improvements to the securitisation framework, the capital charges for large segments of the securitisation market – such as for simple and prudently structured securitisations – now appear overly large compared to the risks involved.

We strongly welcome the recently finalised work of the BCBS-IOSCO and the European Banking Authority (EBA) on criteria to identify such simple, transparent and standard or comparable traditional securitisations. There is very strong evidence that securitisations that are structurally simple and that reference minimum asset credit quality levels have recorded significantly lower losses than the rest. As a result, securitisations meeting minimum simplicity,

transparency and standardisation (STS) as well as certain credit related criteria – as proposed by the EBA – can be allowed lower capital requirements than those currently provided for in the revised securitisation framework, reflecting their enhanced risk profile.

We also welcome the EBA’s proposal⁹ to the Commission to further enhance the Basel III framework by incorporating STS securitisations. Annex 2 compares capital charges under the CRR, Basel III and the EBA simple, standard and comparable (STC) frameworks. At the same time, while understanding the urgency for the Commission to act according to a different timetable from that of the Basel Committee, we encourage the Commission to also take into consideration the international standards that will be finalised at a later stage.

The role of macroprudential buffers

Macroprudential capital buffers, applied on top of regulatory minimum requirements, are designed to mitigate banks’ tendencies towards excess during expansionary phases of financial cycles and thereby ensure banks can keep lending in bad times. Analysis has shown that the higher the banks’ capital buffers, the lower the reduction in credit supply following a negative aggregate demand and aggregate supply shock.¹⁰ By providing banks with sufficient macroprudential buffers, this approach counters the risk of rapidly unwinding positions during contractionary phases, thus attenuating fire-sale spirals which could ultimately lead to a credit crunch via depleted bank capital levels. Capital-based instruments can also be useful to address externalities related to systemic banks, stemming, for example, from their interconnectedness.

Use of macroprudential capital requirements has been limited to a few countries, reflecting the current economic and financial conditions in the euro area. Macroprudential capital buffers announced by the SSM countries to date have focused on instruments mitigating country-specific structural systemic risks, i.e. risks arising from significant size, high concentration and interconnectedness in their banking sectors. While some SSM countries (FI, LV, LT and SK) have decided to anticipate the process of setting the quarterly countercyclical buffer (CCB) rates, none have set the CCB rate above 0%, as the credit to GDP gap is still negative or declining.¹¹

Examples of additional buffer requirements (apart from the G-SII framework) include the Netherlands and Slovakia, which have announced both the systemic risk buffer (SRB) and a buffer for other systemically important institutions (O-SII), to be gradually phased in from 2016. In addition, Estonia applied the SRB in 2014, and Finland has announced the O-SII requirement, which will be applied from January

⁹ “EBA report on qualifying securitisation – response to the Commission’s call for advice of January 2014 on long-term financing”, July 2015

¹⁰ See Kapan and Minoiu (2013), for example.

¹¹ Note that setting quarterly CCB rates becomes mandatory in January 2016.

2016. In addition, some countries have introduced a shorter transition period for the capital conservation buffer, while Belgium and Ireland have applied targeted measures to address specific risks. Actual capital levels for relevant banks generally exceed these higher buffer requirements, therefore an increase in capital requirements is unlikely to have substantial effects on banks' current credit supply. At the same time, stronger capital levels in future could lead to lower funding costs for banks and, in the longer term, have a positive impact on lending to the real economy, by increasing resilience to possible vulnerabilities and future shocks.

2 Regulation and corporate lending

The primary objective of financial regulation is to promote a safe, sound and resilient financial system that can provide financial services in a sustainable manner throughout the whole financial cycle. We must be mindful of this objective when assessing the impact of the new prudential requirements on short-term lending outcomes. To achieve this goal, the stringency of regulation needs to ensure a balance between the need for financial stability and the need for banks to help finance economic activity.

Stability and growth should not be considered as a simple trade-off; a stable financial system supports sustainable economic growth in the long term and vice versa. The approach that EU legislators have taken in providing banks with long lead times to implement the new CRR/CRD IV rules demonstrates sensitivity to these issues. In this regard, the calibration of the new rules aims to ensure that the benefits of the expected long-term financial stability outweigh any potential short-term costs. Negotiations on CRR/CRD IV took full account of this aspect. Thus the gradually increasing demands on banks are well justified given the benefits that more stable banks will generate for the economy over the business cycle.

Impacts of increased capital requirements – funding costs

The effect of an increase in capital requirements on bank lending may vary over time and depend on the way banks implement the new capital standards. As an example, following a system-wide increase in capital requirements, many banks may seek to front-load the new regulation and improve their capital ratios simultaneously,¹² which makes it more costly for each individual bank to issue new outside equity on the market. This is especially the case when the regulatory measure is taken in crisis times, when capital is scarce. As a result, after implementing the measure, banks may be more likely to adjust their assets, and deleverage, rather than raise new equity. In the short run, an increase in capital requirements may therefore have significant negative effects on lending. Such

¹² They may front-load the regulation as a way of indicating their financial health, even though the regulator allows for a phase-in period. One example of front-loading behaviour was banks' increases in capital ratios prior to the announcement of the results of the European stress test and asset quality review in November 2014.

negative effects, though, are expected to gradually dissipate over time, as banks retain earnings and regain affordable access to capital markets.

Data for monetary financial institutions (MFIs) reveal that banks in the euro area have increased their ratio of capital to total assets since 2009. However, this process was largely driven by a build-up of capital well in advance of the CRR/CRD IV implementation in 2014. This early pre-CRR/CRD IV capital build-up was the biggest contributor to the increase in the ratio of capital to total assets observed in recent years. Banks also reduced total assets, but euro area figures show that banks mainly reduced interbank lending and external assets.

The impact of higher capital requirements on individual banks can be quite different. In the short run, undercapitalised banks which need to build up more capital compared to better capitalised banks will face higher funding costs. These higher funding costs might result in tighter credit conditions for these banks as the additional costs will have to be transferred to their customers. This creates an incentive for potential borrowers to switch to different (better capitalised) banks. Undercapitalised banks might also choose to sell certain parts of their asset portfolios. In this case, competitors will take on this business. In turn, there should be no (or only a slight negative) short-run impact on borrowing costs for customers in different asset classes. Such negative effects, though, are expected to gradually dissipate over time, as banks retain earnings and regain affordable access to capital markets.

The impact of higher capital requirements on bank lending may vary according to borrower risk type. With the adoption of economic capital models by banks and the risk-based capital regulation framework, the increased funding costs due to a higher proportion of equity financing may be passed on differently (in absolute terms) to the lending rates of risky borrowers, such as SMEs, compared with the lending rates of less risky borrowers, such as mortgages.¹³ Hence, although the average impact of an increase in capital requirements on bank lending rates is shown to be relatively small, there may be important distributional impacts that need to be further analysed.¹⁴

¹³ Note that this is an intuitive argument. The ECB is not aware of any empirical evidence that clearly isolates the effect of generally increased risk-weighted capital requirements on the lending rates experienced by SMEs and of mortgage loans.

¹⁴ It can be shown that this result rests on the realistic assumption that the Modigliani-Miller irrelevance theorem for debt and equity financing does not hold. The most obvious policy option to tackle this issue would be to restore the validity of the MM irrelevance theorem. The Commission has recently raised the issue of addressing the debt bias in the context of the consultation on the Common Consolidated Corporate Tax Base (CCCTB). Moreover, the global regulatory agenda to end the well-known explicit and implicit public subsidies for debt issued by systemically important banks also helps in this respect.

Short run – transition phase

Table 1

Effects of an increase in capital requirements on bank lending in the transition

	pp-variation in cap. Req.	Effect on bank lending volume	Horizon
Maurin and Toivanen (2012)	+1pp	-2.15%	medium term
Aiyar et al. (2014)	+1pp	-8.40%	1 year
Noss and Toffano (2014)	+1pp	-4.50%	3 years
Messonnier and Monks (2014)	+1pp	-1.40%	1 year
Brun et al. (2015)	-1pp	5.00%	short term

The estimates reported in Table 1 are based on micro-econometric studies.¹⁵ The use of bank-level idiosyncratic responses provides a sensible identification strategy for the exogenous effects of shocks to bank capitalisation. However, these results are only indicative of the cost associated with regulatory reforms, and probably over-estimate the effect of regulation in the short run as:

- they were conducted during the recent crisis, where the responses of banks to regulatory changes are the largest insofar as in crisis times banks have fewer options to adjust (see Jimenez et al., 2014);
- they are based on micro-econometric studies and therefore neglect the general equilibrium effects, whereby borrowers could substitute other sources of funding for bank loans; and
- capital requirements only have an indirect impact on lending volumes via pricing because banks manage their loan portfolios via internal funds transfer prices.

Long run – steady state

Table 2

Effects of an increase in capital requirements on bank lending in the steady state

	pp-variation in cap. Req.	Effect on bank lending rate
Kashyap et al. (2010)	+1pp	+0.03pp
King (2010)	+1pp	+0.15pp
Kisin and Manela (2015)	+1pp	+0.003pp

The estimates reported in Table 2 show that, overall, the effects of capital requirements on lending rates are not significant. The impact of a 1pp increase in capital requirements on lending rates ranges from 0.03pp to 0.15pp. In the long run, impacts on volumes are expected to occur through changes in pricing associated with increased capital requirements, rather than through direct cuts in the loan supply.

¹⁵ Brun et al. (2015)'s study is of particular interest as it focuses on the effects of the implementation of the Basel II capital regulation in 2008 in France, which reduced French banks' regulatory capital by approximately 10%. Note that the effects of a variation in the capital requirement on lending may well be asymmetric, i.e. larger in the case of positive than negative variations. Jimenez et al. (2014) estimate the effect of the increase in general provisions on bank lending in Spain in 2012. Consistent with the results in Table 1, they too find that such measures had a significant negative effect. However, their analysis does not permit the derivation of elasticities.

Given the steady state results for lending in table 2, the long-run impact in lending volumes of a 1 percentage point increase in capital requirements should also be low.¹⁶

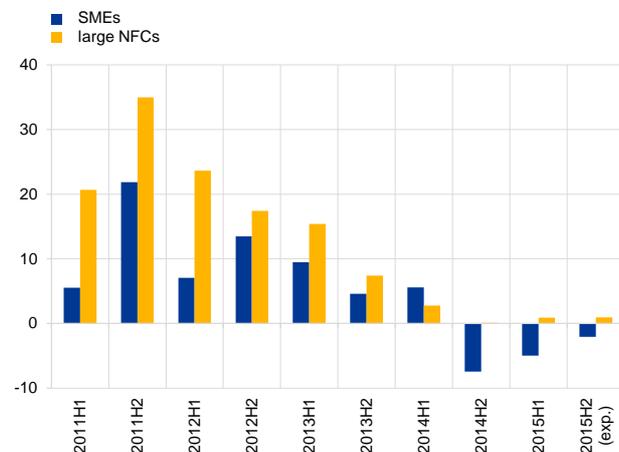
Where are we in the transition phase? – BLS data

The evidence of the ECB’s Bank Lending Survey (BLS) provides a useful guide to the role of regulation in influencing lending demand and supply in recent times – during the transitional phase to the new steady state of higher system-wide capital levels. Consistent with the narrative set out above, there is some evidence of a tightening effect on credit¹⁷ in the transition phase as banks adjust to meet the CRR/CRD IV requirements. Charts 1, 2 and 3 below summarise banks’ responses to BLS’s specific questions on the impact of regulatory action on their balance sheets and lending conditions. This reflects, to some extent, the impact of the preparation for and the implementation of the CRR/CRD IV.¹⁸ However, the results also reflect other supervisory (e.g. the CA) and regulatory (e.g. liquidity rules) actions.

Chart 3

Contribution of regulatory or supervisory actions to the tightening of credit standards

(net percentages of banks)

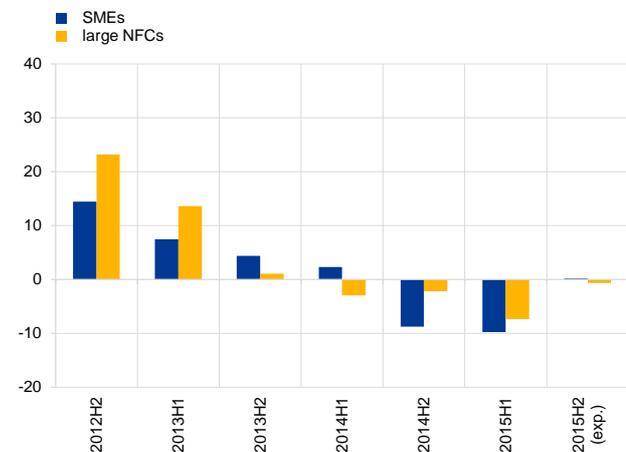


Notes: The net percentages are defined as the difference between the sum of the percentages for “deteriorated considerably” and “deteriorated somewhat” and the sum of the percentages for “eased somewhat” and “eased considerably”. The results shown are calculated as a percentage of the number of banks which did not reply “not applicable”.

Chart 4

Contribution of regulatory or supervisory actions to the widening of loan margins

(net percentages of banks)



Notes: The net percentages are defined as the difference between the sum of the percentages for “widened considerably” and “widened somewhat” and the sum of the percentages for “narrowed somewhat” and “narrowed considerably”. The results shown are calculated as a percentage of the number of banks which did not reply “not applicable”.

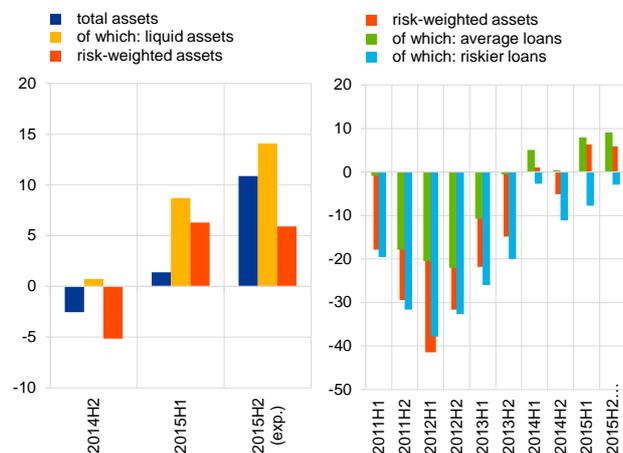
¹⁶ Note the relevance here of *The Impact of capital requirements on bank lending, Bank of England Working Paper 486, Bridges, Gregory, Nielsen, Pezzini, Radia and Spaltro, 2014*. This assesses the impact of capital requirement increases from a loan volume perspective and finds that loan growth impacts are heterogeneous across asset classes, focused on reductions to commercial real estate, corporate, and household loans. Loan growth mostly recovers within three years.

¹⁷ Credit tightening observed via tighter credit standards, widening loan margins, and lower loan volumes.

¹⁸ This also includes the impact of the EBA Basel III monitoring exercise as of 30 June 2012.

Chart 5**Impact of regulatory or supervisory actions on banks' assets**

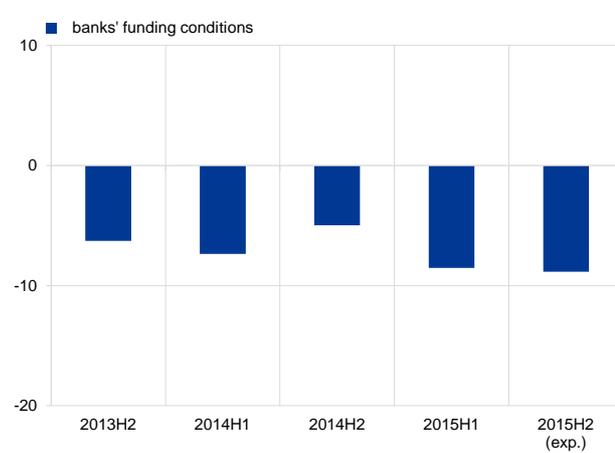
(net percentages of banks)



Source: Eurosystem's Bank Lending Survey Notes. – Notes: Net percentages are defined as the difference between the sum of the percentages for "increased considerably" and "increased somewhat" and the sum of the percentages for "decreased somewhat" and "decreased considerably".

Chart 6**Impact of regulatory or supervisory actions on banks' capital**

(net percentages of banks)



The data is consistent with a tightening of credit conditions in the phase of transition to new capital requirements, followed by a drop-off in impact in later periods. Evidence of a potential drop-off in pressure on banks' balance sheets is also provided by the results of the BLS survey regarding the impact of regulatory /supervisory action on bank funding conditions.

Banks reported a net positive impact of regulatory and supervisory action on their funding conditions in recent times. As banks' balance sheets have become more secure and more loss-absorbing, bank debt finance has become easier to access – as the perceived riskiness to creditors has diminished. In turn, these positive developments should in the medium- to long-run be passed through to borrowers via banks' internal pricing strategies.

Decreases in loan demand are also an important factor that has driven much of the observed reduction in corporate lending over the crisis period. As in the case of banks, some corporates took on too much debt during the boom phase prior to the crisis, and a natural period of deleveraging was unsurprising once the macroeconomic outlook was revised downwards. Looking ahead, the extent to which banks can meet future credit demand is aligned to the macroeconomic scenario that materialises. In a base case scenario, banks might comfortably be able to meet capital requirements whilst accommodating the credit demand associated with projected economic growth. However, in an optimistic scenario with a strong recovery in investment demand, a swift uplift in credit demand may conceivably be beyond the capacity of banks to accommodate. Likewise, if a poor macroeconomic scenario materialises, credit constraints may also return, as the build-up of non-

performing loans and low-profit outcomes will push banks towards deleveraging.¹⁹ Strong bank balance sheets – including adequate good quality capital - are prerequisites for good lending outcomes, especially in negative macroeconomic scenarios.²⁰

Overall, the evidence from the BLS may suggest that the impact of increased capital requirements has been temporary – with the tightening effect on credit conditions already receding. However, clearly, the BLS evidence relies upon the subjective responses of bankers to the questions asked. No robust findings of causality can therefore be claimed in the data patterns observed.²¹ Therefore, this analysis is complemented by empirical analysis of the effect of CRR/CRD IV on the lending behaviour of banks.

In order to gauge the impact that the inception of CRR/CRD IV and related events had on euro area banks' lending rates, a series of bank fixed-effect panel regression models were estimated based on MFI-level data for interest rates (IMIR) and loan volumes (IBSI). Some negative loan supply shock patterns are identified, although they appear to be relatively limited in economic terms; a finding which holds both at country and euro area level for different portfolio segments. Due caution is required in interpreting the results given the challenge of singling out the effect of the introduction of CRR/CRD IV on banks' loan supplies. There were numerous events that led banks to modify their capital structure during the time in question, which will each have influenced loan pricing and loan volume decisions.²² The study tries to control for these concomitant factors but the difficulties of doing so should be borne in mind.

The key findings of the analysis are: (i) at euro area aggregate level, the introduction of the CRR/CRD IV contributed to an increase in lending rates across different loan products of between 0-15 basis points (bps). The estimated impact of the aggregated lending rate on non-financial private sector loans (i.e. households and firms combined) amounts to 9 bps. (ii) When looking for different effects on rates by banks with different balance sheet characteristics, we find that the impact of CRR/CRD IV was stronger for less capitalised banks and banks with lower risk-weighted asset (RWA)/total asset (TA) ratios. Lastly, (iii) banks with high non-performing loan (NPL) ratios (i.e. weak credit portfolios) were also relatively more strongly affected by the CRR/CRD IV. While acknowledging the caveats surrounding the impact of the

¹⁹ For a more detailed analysis in this regard, see: Bank lending and capital, DNB Occasional Studies – Vol 12/No 3 (2014).

²⁰ See Box A below, and Annex 1 for empirical evidence of the importance of strong capital in maintaining lending through the economic /financial cycle. See also *Credit Supply: Identifying balance-sheet channels with loan applications and granted loans*, ECB Working Paper 1179, Jimenez et al 2010, which further shows that bank lending constraints during downturns are concentrated in the weakest capitalised banks.

²¹ The BLS data also provides some indications of the relative impacts of bank capital requirement changes across corporates and SMEs. Charts 1 and 2 indicate that the short-term tightening effect on credit standards and loan margins was focused most strongly on larger firms, rather than SMEs. In contrast, in terms of volumes (chart 3), the riskiest loans were reduced more than average loans.

²² Most notably, when considering the EBA capital exercise in 2011/12 and the ECB's Comprehensive Assessment in 2014 but also more generally the challenges faced by banks due to the euro area sovereign debt crisis.

introduction of CRR/CRD IV on the estimated lending rate, the estimated increase in the euro area banks' lending rates can be used to gauge the macroeconomic costs of introducing the new capital requirements. To quantify the likely impact of a 9-bps increase in non-financial private sector lending rates on macroeconomic variables, a suite of Dynamic Stochastic General Equilibrium (DSGE) models, which is in regular use at the ECB to calculate the steady state impact on euro area aggregate GDP, has been employed.²³ Under the "conservative" assumption that the lending rate increase is permanent,²⁴ the macroeconomic impact is calculated in each model by changing the values of key parameters to obtain steady states with higher lending spreads. The long-run effects on output are then calculated as percentage changes relative to the baseline steady state.²⁵ The median steady state output loss across a number of ECB DSGE macro models including banking sectors and financial frictions amounts to -0.20% (compared to the baseline) for a 9-bps increase in bank lending spreads. Accounting for differences in model specifications, estimation and calibration approaches, the real GDP impact could be expected to lie within a range of -0.08% to -0.28%, compared to the baseline.

3 Lending to SMEs

The SME support factor

Given the objective of financial regulation stated above, the appropriate starting point for discussing the SME support factor is to assess whether it has provided appropriate prudential treatment in view of the risks associated with SME assets. The prudential capital framework for banks is best designed to reflect the inherent risk of the different types of assets to which banks lend. The capital framework should not be manipulated to encourage investment in one asset class rather than another, as this may risk distorting banks' behaviour, leading to higher financial risks and poorer resource allocation.

The evidence is currently inconclusive as to whether SMEs warrant the lower risk weight attributed to them under the CRR. SMEs tend to generate more losses /NPLs for banks in comparison to corporate loans. The July 2015 EBA Discussion Paper and Call for Evidence on SMEs and the SME support factor indicates that within non-financial corporates, SMEs' NPL ratio is double that of large corporates' (18.6% vs. 9.3%).²⁶ However, regarding the systematic component of

²³ The models employed include Christiano et al. (2010), Gertler and Karadi (2011), Darracq et al. (2011), Angeloni and Faia (2013), Boissay et al. (2015), Clerc et al. (2015), Mendicino et al. (2015) and Darracq et al. (2015a-b).

²⁴ This is admittedly a strong assumption, as some of the effects might only be temporary. The estimated macro impact reported below should therefore be seen as an upper limit.

²⁵ It should be noticed that in most models, higher lending spreads are generated through parameter changes that do not necessarily relate to regulatory reforms.

²⁶ Note that the EBA's ongoing policy debate in this area should be seen in the context of the Basel *Regulatory Consistency Assessment Programme (RCAP)*, which finds that the SME support factor is a "material deviation from Basel rules". Source: BCBS (2014): RCAP – assessment of Basel III regulations – European Union.

default risk²⁷, the Basel framework acknowledges that asset correlation is lower for SMEs than for corporates.²⁸ In general, the academic literature finds that asset correlations increase with firm size meaning that asset correlations for large corporates are higher than for SMEs.

Another relevant factor is the loss given default (LGD) for SMEs, which the EBA risk dashboard 2014 showed to be generally lower for SMEs in comparison to corporates in the internal ratings based approach (IRB) to banks' modelling choices.²⁹ This may provide some additional justification for the appropriateness of the SME support factor, especially for smaller banks that use the standardised approach for credit risk and medium-sized banks using Foundation IRB.³⁰ However, for the biggest banks that use Advanced IRB, differences in LGD should be factored directly into risk weight calculations.

SME access to finance – barriers and solutions

SMEs are usually perceived both to have a higher probability of default than larger firms and to be more informationally opaque. For this reason, in particular, SMEs are more hard-pressed to find alternative sources of financing for bank lending, such as debt issuance. Additionally, SMEs are typically too small to absorb the fixed costs associated with debt issuance in the financial market. As a consequence, they are relatively more dependent on bank finance and thus more likely to be affected by banks' increased risk aversion than larger firms.

At this stage, however, it is not clear whether lower risk weights on loans to SMEs have fostered new lending to SMEs.³¹ Furthermore, it should also be taken into consideration that such amendments act through a reduction in banks' capital requirements, which only have an indirect impact on banks' lending decisions towards SMEs. In particular, the BLS data below show that capital may only play a rather modest role in banks' lending decisions.

Given the inherent heterogeneity of the SME sector, several funding instruments and options should be considered to meet the needs of the various SMEs and lenders or investors. The Commission's action plan for SMEs covers a wide range of initiatives and regulatory measures which may be more promising and effective in promoting SME lending, compared with the SME support factor. For example, the ECB tends to agree that it is important to promote venture

²⁷ The systematic component of default risk means the extent that default risk depends on the general movement of the economic cycle in contrast to the specific economic circumstances of the particular type of obligor (measured in the IRB approach with the asset correlation factor).

²⁸ The EU also introduced a more favourable asset correlation factor for SMEs in the IRB framework - Art. 153 CRR. This, in principle, covers the differentiation in the systematic component of default risk across asset classes.

²⁹ See annex to EBA Risk Dashboard Q3 2014, p3.

³⁰ Under the standardised approach there is no explicit LGD adjustment, with risk weights determined by the tables in CRR, Art 114 - 134. Under Foundation IRB, a flat LGD of 45% applies.

³¹ A study in Spain reveals that these changes have had a positive impact on lending to Spanish SMEs. Bank of Spain, Financial Stability Report, May 2014.

capital, improve SMEs' access to capital markets, promote the use of ratings by SMEs, and explore better enforcement of late payment rules. These measures, which are very important in helping SMEs' general access to finance, would in particular promote SME creditworthiness and the access of smaller firms to banking finance. In addition, some degree of diversification of external finance would be welcome from a macroprudential perspective.

A major obstacle to SMEs' access to markets is the lack of information on their credit quality. The 2013 report of the High Level Expert Group on SME and Infrastructure Financing (HLEG Report) identified a number of possible actions in this regard, in particular, action to facilitate credit analysis via public and private databases, the aggregation of business registers, standardised and more widespread use of credit scoring, and standardised loan-level information on asset-backed securities (ABS). The ECB is currently finalising work on a granular credit risk dataset (AnaCredit). The first stage of this initiative – to be completed by early 2018 – will allow enhancements in the set of tools of policy-makers, based on transparent, harmonised and granular information on the credit granted by credit institutions to financial and non-financial corporations and general government. At later stages, the scope and user base of AnaCredit could be expanded. This would be particularly important for SME loans and would help investors to develop their own credit models and risk metrics.

Under the capital markets union (CMU), the European Commission aims to develop a more diversified financial system that complements bank financing with deep and developed capital markets. This is intended to unlock more investment for all companies, especially SMEs. For example, replacing private debt funding with equity financing would reduce the debt burden of the euro area non-financial corporate sector and thereby dampen any transitional impacts of bank deleveraging on the real economy. However, limited access to market-based financing for SMEs and low overall reliance on equity financing by euro area firms represent two significant obstacles to this course of action.

Alternative sources of financing need to be developed to cater for the specific needs of smaller firms. Alternative investment markets designed for the issuance of SME bonds (for example, the mini-bonds initiative in Italy) are examples of potential strategies. By exploiting less stringent regulations and tax incentives (without creating loopholes for regulatory arbitrage), these alternative markets aim to overcome the major barriers in terms of costs and compliance requirements that usually prevent SMEs from accessing external finance. Initiatives to enhance liquidity and incentivise investors should be strengthened, such as the optional listing on particular segments of regulated markets or multilateral trading facilities (MTFs) with simplified listing requirements and/or the use of some covenants and guarantees. Through these channels, SMEs can issue instruments with medium- to long-term maturities, thereby lengthening the average duration of their financing.

Peer-to-peer finance (crowdfunding and peer-to-peer lending) is another example of such alternative financing tools. Despite being a relatively new and small source of entrepreneurial finance, this source of funding is growing rapidly and has the potential to reach many smaller firms in a wide range of industries, for which other

market-based sources of finance are inaccessible. Crowdfunding has the potential to provide means of financing which are tailor-made to the needs of certain players, such as small firms or individual entrepreneurs.

The Commission's initiative to introduce revised and more favourable treatment for STS securitisations may help free up banks' balance sheets, with potential benefits to SME lending. However, the creation of an STS asset class should ensure that investors retain their incentives to undertake proper due diligence on their investments.

Despite all the promising avenues that exist for diversifying SMEs' financing options in future, it is likely that these businesses will remain highly dependent on bank finance in the medium term. Therefore, in the absence of clear alternatives to bank finance, special care should be taken when making regulatory changes that may affect bank lending to the SME sector.

4 Proportionality and simplification

While seeking to achieve full compliance with international standards for large banks and banking groups with significant cross-border activities, differentiated treatment may be justifiable in the case of smaller institutions that are only active on local markets. Overall, differentiation between institutions on grounds of size and risk profile is, if well justified and properly calibrated, compatible with single market and financial stability considerations.

The CRR already respects the principle of proportionality, having regard in particular to the diversity in size and scale of operations and to the range of activities of institutions [Recital (46) CRR]. The CRR is already supposed to be applied in proportion to the nature, scale and complexity of the risks associated with an institution's business model and activities. This is achieved by making simpler standardised approaches available where the size and scale of the operations or the nature, scale and complexity of the risks do not require the effort of applying a more sophisticated approach for achieving the prudential objectives.

Further differentiation e.g. depending solely on the size of an institution, regardless of the nature, scale and complexity of the risks of a certain business activity, may skew the level playing field and thus requires careful assessment. Potential changes that would allow smaller institutions to provide the same services as larger institutions at lower costs would not be justified if this resulted in insufficient protection of smaller institutions and their creditors against the risks associated with the activity.

Overall, the EU legal framework should reflect and be fully aligned with developments at international level, in particular regarding the Basel Committee's ongoing initiative on enhancing the simplicity and comparability of the Basel capital framework. Unilateral action from the EU or deviations from international standards (in particular as regards the regulation of large, internationally active banks) are not supported by the Eurosystem.

5 Single rulebook

The CRR, which is directly applicable to all EU banks and competent authorities, is an important step towards creating a more level playing field and achieving closer integration in the EU banking sector. However, the CRR still contains provisions offering a number of alternatives and allowing Member States and competent authorities a certain amount of discretion, although many of these provisions are time-limited or subject to review clauses. The ECB is particularly committed to promoting a level playing field and financial integration, and contributing to the objectives of the Banking Union. For this reason, the ECB has recently started a rigorous assessment in order to determine how to implement provisions offering alternatives and discretions in the best interests of the Banking Union (see Annex 3 for details).

While the single rulebook is an important pillar of microprudential supervision, it needs to be accompanied by rules that allow authorities to achieve macroprudential policy goals as well. Given that the application of a single set of rules to countries with different cyclical and structural features may not be appropriate or sufficient for mitigating systemic risks, it is essential that legislators acknowledge that justified deviations from a single set of rules - via the definition of specific and well-targeted macroprudential instruments and coordination mechanisms - are necessary. Importantly, by ensuring financial stability, macroprudential policy also contributes to the protection of the single market.

Annex 1

Macroeconomic impact of higher capital requirements

1 How much bank capital is enough? What does the recent macroeconomic literature tell us?

The ongoing discussion about capital requirements implicitly assumes that the regulator faces a trade-off between financial stability and the cost of financial intermediation. Implicit in this trade-off is the notion that the relationship between the level of capital and social welfare can be represented by a simple concave function, whose maximum value corresponds to an “optimal” level of capital, which maximises aggregate welfare in the economy.

According to this conceptual framework, welfare is therefore lower in economies in which capital ratios lie below this optimal level. While financial intermediation costs are lower for this range of capital levels, the idea is that insufficient capital buffers imply a probability of financial instability that is too high relative to what could be obtained under the optimal requirement. Similarly, imposing levels of capital that are in excess of the optimal requirement generates an increase in financial intermediation costs, and as a result, a reduction in the supply of bank loans, that is too high relative to the benefits obtained from reducing the probability of financial instability.

In practice, providing an estimate for the optimal level of bank capital is a complex task that is subject to a series of major methodological challenges. First, quantifying this trade-off requires a framework in which the effects of bank capital on the costs of financial intermediation and on the supply of loans can be represented. Second, this analysis needs to be conducted within a framework in which the effects of financial instability on output can be measured. And finally, this issue needs to be addressed in a model in which a social welfare function that takes into account these two competing effects can be derived.

In spite of these challenges, several studies have recently attempted to provide an estimate of the optimal capital requirement using different methodologies. The quantitative cost-benefit analysis of capital requirements conducted by the BIS (e.g. BIS 2010) finds that the net benefits of increasing capital ratios are positive for a broad range of values. Overall, the main conclusion of this study is that capital ratios are too low and that there is considerable scope to increase capital while generating positive net benefits. Similarly, using data from a wide range of countries over a period of almost 200 years, Miles, Yang and Marcheggiano (2012) conclude that bank capital should be around 20% of risk-weighted assets. In their approach, the main social benefit of capital requirements is to reduce the chance of banking crises, which are usually associated with high output losses. At the same time, higher

capital ratios increase the cost of capital, as equity replaces debt, which translates into higher intermediation costs. Since higher intermediation costs increase the interest rate charged to borrowers, higher capital ratios reduce aggregate investment and therefore output. A related study by Kashyap et al. (2010) estimates that large changes in capital requirements are likely to lead to small long-run impacts on the borrowing costs that banks will charge to borrowers. This study focuses on the cost side of capital requirements and, as in Miles et al. (2012), their estimate relies on the framework of Modigliani and Miller (1958), where the primary differences in the costs of debt and equity finance are due to differences in their tax treatment.

The idea that too-low capitalisation can be costly is addressed in Shleifer and Vishny (2010), who present a model of unstable and leveraged banks operating in financial markets to explain the cyclical behaviour of credit (and investment).³² It has also been argued that higher capital induces banks to better screen borrowers (Coval and Thakor (2005)) and to more efficiently monitor them (Holmstrom and Tirole (1997) and Mehran and Thakor (2011)). Building on Miller (1995) and the Modigliani-Miller capital structure irrelevance theorem, Admati et al. (2011) and Admati and Hellwig (2013) call for much higher capital ratios than those currently imposed. According to their assessment, the social costs of significantly higher requirements will be negligible and the benefit of reduced probabilities of failure far outweighs these costs.³³

In Clerc et al. (2014), this trade-off is studied in a DSGE model in which limited liability creates an externality that market participants fail to internalise, and which leads to excessive risk-taking. Following Bernanke, Gertler and Gilchrist (1999), the main feature of this model is that a default decision is introduced in all three sectors of the economy. Under the calibration strategy adopted, the authors find that the optimal capital requirement should be around 10.5% for business loans. Martinez-Miera and Suarez (2014) study this trade-off in a DSGE model in which the classic risk-shifting problem associated with leverage is reinforced by the presence of safety net guarantees. The model mechanism is illustrated by considering a scenario in which the optimal capital requirement is 14%. Begeau (2015) develops a DSGE model in which households have a demand for safe and liquid assets. By making bank debt a safe investment for households, an implicit government guarantee creates a violation of the Modigliani-Miller theorem, which leads banks to choose as much leverage as allowed by regulation. In this framework, the author finds that the optimal capital requirement, where there is a trade-off between the reduced supply of safe assets and lower output volatility, should be around 14%.

Nguyen (2014) calibrates a model that matches key points in the distribution of U.S. banks as well as macroeconomic quantities, and finds an optimal capital requirement that is two percentage points higher than the Tier 1 capital recommended by Basel

³² See also related papers including fire sale effects related to forced deleveraging when banks need to restore solvency (and liquidity) positions after being hit by adverse shocks, e.g. Fostel and Geanakoplos (2008), Shleifer and Vishny (2011), and Diamond and Rajan (2011).

³³ DeAngelo and Stulz (2013) and Calomiris (2013) present a critique that refutes the relevance of the Modigliani-Miller theorem in the case of liquidity-producing banks. Thakor (2014), on the other hand, provides some empirical evidence in support of substantially higher capital requirements in the banking system.

III. His analysis suggests that welfare gains are still sizeable even at very high capital requirements. In his model, capital requirements below the optimal level lead to excessive lending to risky firms that invest in low-productivity projects. The costs of imposing capital requirements that are higher than the optimal level take the form of issuance costs as well as learning-by-doing externalities that amplify the negative effects of under-investment.

Like Begenau (2015), the analysis of Van den Heuvel (2008) emphasizes the cost of capital requirements due to a reduction in banks' ability to create liquidity. In his dynamic general equilibrium model, the government manages the deposit insurance fund, sets capital requirements and conducts bank supervision. The rationale for capital adequacy regulation is its role in preventing excessive risk-taking but the key difference is that the optimal capital requirement is strictly positive only if bank supervision is imperfect. Indeed, the benefit of the capital requirement in the model is that it can economise on supervision spending. Conditional upon the full prevention of financial crises, the paper (which was written before the 2008-09 crisis) finds that capital requirements were too high in the U.S. relative to supervision expenses. Finally, Calomiris and Herring (2013) propose the introduction of a requirement for convertible contingent capital, i.e. an instrument which could be converted from bonds to equity, as an alternative means of raising the capital buffers. The authors argue that this type of instrument would encourage the replacement of any lost equity with the issuance of new equity into the market. One main argument is that the threat implied by a conversion from debt to equity would create strong incentives for management to avoid excessive risk-taking activities.

2 Evidence from micro-econometric studies

The effect of an increase in capital requirements on bank lending may vary over time and depends on the way banks implement the new capital standards. For example, following a system-wide increase in capital requirements, many banks may seek to front-load the new regulation and improve their capital ratio simultaneously,³⁴ which makes it more costly for each individual bank to issue new outside equity on the market. This is especially the case when the regulatory measure is taken in crisis times, when capital is scarce. As a result, after implementation of the measure, banks are more likely to adjust their assets, and deleverage, rather than raise new equity. In the short run, an increase in the capital requirement is therefore likely to have significant negative effects on lending. Such negative effects, though, should gradually dissipate over time, as banks retain earnings and regain affordable access to capital markets.

It follows that, overall, the short-run reaction of bank lending to an increase in capital requirements probably "overshoots" the long-run reaction, especially during crisis

³⁴ They may front-load the regulation as a way of indicating their financial health, even though the regulator allows for a phase-in period. One example of front-loading behaviour is banks' increases in their capital ratios prior to the announcement of the results of the European stress test and asset quality review in November 2014.

times. The section below summarises the results of recent micro-econometric studies of those effects (i) in the short run, during the transition period to the new standards; and (ii) in the long run.

Table 1
Effects of an increase in capital requirements on bank lending in the transition period

	pp-variation in cap. Req.	Effect on bank lending volume	Horizon
Maurin and Toivanen (2012)	+1pp	-2.15%	medium term
Aiyar et al. (2014)	+1pp	-8.40%	1 year
Noss and Toffano (2014)	+1pp	-4.50%	3 years
Mesonnier and Monks (2014)	+1pp	-1.40%	1 year
Brun et al. (2015)	-1pp	5.00%	short term

The estimates reported in Table 1 are based on micro-econometric studies.³⁵ The use of bank-level idiosyncratic responses provides a robust identification strategy for the exogenous effects of shocks to bank capitalisation. However, these results are only indicative of the cost associated with regulatory reforms, and probably over-estimate the effect of regulation in the short run as:

- they were conducted during the recent crisis, where banks' responses to regulatory changes are the largest, insofar as, in crisis times, banks have fewer options to adjust (see Jimenez et al., 2014);
- they are based on micro-econometric studies and therefore neglect the general equilibrium effects, whereby borrowers could substitute other sources of funding for bank loans;
- capital requirements only have an indirect impact on lending volumes via pricing because banks manage their loan portfolios via internal funds transfer prices.

Table 2
Effects of an increase in capital requirements on bank lending in the steady state

	pp-variation in cap. Req.	Effect on bank lending rate
Kashyap et al. (2010)	+1pp	+0.03pp
King (2010)	+1pp	+0.15pp
Kisin and Manela (2015)	+1pp	+0.003pp

The estimates reported in Table 2 show that, overall, the effects of capital requirements on lending rates are extremely small. The impact of a 1pp increase in capital requirements on lending rates ranges from 0.03pp to 0.15pp. These results, however, are only indicative of the costs associated with regulatory reforms, and probably underestimate the effect of capital requirements in the long run, to the extent that:

³⁵ Brun et al. (2015)'s study is of particular interest as it focuses on the effects of the implementation of the Basel II capital regulation in 2008 in France, which reduced French banks' regulatory capital by approximately 10%. Note that the effects of a variation in the capital requirement on lending may well be asymmetric, i.e. larger in the case of positive than negative variations. Jimenez et al. (2014) estimate the effect of the increase in general provisions on bank lending in Spain in 2012. Consistent with the results in Table 2, they too find that such measure had a significant negative effect. However, their analysis does not permit the derivation of elasticities.

- they rely on small variations in bank capital. To the extent that those variations reflect endogenously determined optimal liability structures, the impact of exogenous changes in regulation is expected to be much larger;
- the effects of bank capital regulation on lending may increase non-linearly in the level of capital. This caveat calls for caution in extrapolating the observed low costs of capital to costs of capital at substantially higher levels.

3 Further discussion

It is difficult to determine the effect of the move towards a further enhanced regulatory regime (CRR/CRD IV) on bank behaviour for the main reason that a number of events took place over recent years, which all entailed significant action by banks on their capital structure. Coordinated centrally-led EU-wide stress tests took place in 2010, 2011, and 2014, with the stress test and accompanying asset quality review (AQR) in 2014 being particularly significant in terms of size and scope as it was the assessment preceding the inception of the SSM in winter 2014. In addition, an EU-wide capital exercise (recapitalisation), led by the EBA, took place in 2011/12, which was not a stress test but an assessment of the capital position at that point in time. Against the backdrop of market developments and the deterioration of the sovereign debt crisis in Europe, the EBA aimed to review banks' actual capital positions and sovereign exposures and asked them to set aside additional capital buffers. In parallel to these EU-wide exercises, the new regulatory regime (CRR/CRD IV) was surfacing, which motivated banks to front-load capital enhancing measures (as discussed earlier). These examples are all meant to highlight the fact that it is inherently difficult – in particular in recent years where many confounding events occurred that influenced the dynamics of banks' capital structures – to single out the reaction of banks to one specific event.

Banks increase their capital ratios partly through tighter lending conditions, deleveraging on core bank assets and the issuance of equity. In macro models, bank deleveraging is found to be detrimental to economic activity in the short to medium run. However, in the long run, the strengthened bank balance sheet is shown to reduce and eventually outweigh the adjustment costs. Given that they are estimated based on historical regularities, the adverse real financial interactions at play in these structural models are subject to great uncertainty. Indeed, both the changes in the regulatory standards and the ongoing drastic transformation in the banking sector are unprecedented in the sample. Box A illustrates the economic implications of banks' adjustments to higher capital requirements based on the results of the Comprehensive Assessment (CA).

Box A

An illustration of the economic implications of banks' adjustments to higher capital requirements based on the results of the CA

In this box, we illustrate the macroeconomic risks related to the adjustment to higher capital ratios using the results published as part of the CA. The process provided incentives for banks to consolidate their balance sheets and start to comply in advance with new regulatory requirements. In this context, it can be seen that the adjustment has the potential to ultimately reduce fragmentation in the banking sector as market perceptions of euro area banks improve.

Table 1

Possible interpretations of the comprehensive assessment results (% RWA)

	Estimated capital shortfall of banks covered by the CA (% RWA)
Baseline shortfall	0.11
Incl. cap. Ac.	0.13
Hurdle rate of 7%	0.46
Incl. cap. Ac.	0.41
And AQR remaining	0.62
Incl. cap. Ac.	0.57

Source: ECB estimates based on ECB (2014).

Notes: The baseline shortfall corresponds to a hurdle rate of 5.5% in the adverse scenario. The lines "Incl. cap. Ac." (Including capital accumulation) report the shortfall of the line above reduced by an estimate of the capital accumulated in 2014 as a result of the banks having a shortfall.

In the context of the Basel III monitoring exercise, the EBA has been publishing estimates of banks' capital shortfalls to a fully front-loaded Basel III capital requirement for European banks. The subsequent estimates have shown an increase in the average CET1 ratio from less than 7%³⁶ in the middle of 2011, to over 11% at the end of 2014. Compared to this adjustment, which has already been made by European banks, the aggregate capital shortfall identified in the CA, which falls below 0.1 p.p. of RWA at euro area level (see Table 1), appears relatively modest.

However, there are several possible interpretations of the results of the CA in terms of the necessary additional consolidation of balance sheets. The way banks and markets interpret them is key to assessing the overall impact of the rise in the capital ratio on the economy. Against this background, we construct stylised macroeconomic scenarios in which we evaluate how short-term adverse credit supply effects would be gradually offset by improvements in bank funding and market access in a kind of balancing act. Under plausible conditions, increasing the capital ratio above the minimum requirement revealed by the CA might generate some positive effects on activity and lift inflation.³⁷

First, banks may face market pressure to be seen as over-performing the exercise, requiring banks in the grey area to withstand an adverse scenario with a capital ratio of over 7.0%, instead of 5.5% in the CA, the minimum CET1 ratio required under CRR/CRD IV. In this case, restricted information indicates that the shortfall would amount to 0.5 p.p. of RWA for the euro area as a whole (Table I, third row).

³⁶ This corresponds to the minimum capital requirement under Basel III plus the capital conservation buffer.

³⁷ The macro-financial scenarios are constructed in three layers using a DSGE model with financial frictions (see DKR (2011)) and two satellite models for bank debt pricing (see Maurin and Galiay (2015)) and interbank market network interactions (see Kok and Halaj (2014)). In the structural model, the macroeconomic transmission channel of increasing bank capital ratios implies tighter lending conditions for firms and households and significant deleveraging on core bank assets. In Maurin and Galiay (2015), the stronger resilience of banks associated with higher capital ratios reduces the pass-through of macroeconomic and bank-specific risk to banks' funding costs. Hence, for the same level of risk, banks with a stronger capital base have a lower cost of debt.

Second, it is additionally assumed that all banks were surprised by the other adjustment needs, notably in terms of provisioning, revealed by the AQR. Some actions in this direction may come under Pillar 2 as part of normal supervisory monitoring. In this case, the shortfall would increase further to above 0.6 p.p. of RWA at euro area level (Table I, fifth row).

Against this background, we construct stylised macroeconomic scenarios in which we evaluate how short-term adverse credit supply effects would be gradually offset by improvements in bank funding and market access in a kind of balancing act. Under plausible conditions, increasing the capital ratio above the minimum requirement revealed by the CA might generate some positive effects on activity and lift inflation prospects by 2016 through its benefits on the functioning of the bank lending channel.³⁸

First, the model simulation suggests that closing the gap has a negative impact on economic activity through tighter bank lending conditions.

Second, we consider the medium-term improvements in individual bank funding costs due to their stronger capital positions, as bondholders require less compensation for a bank's idiosyncratic credit risk. Hence, for a given regulatory environment, when a bank increases its capital ratio, its funding costs become less responsive to the risk in its book. Using the estimations developed in Maurin L. and A. Galiay (2015), an increase of 0.6 p.p. in the bank capital ratio would then lower the bank's composite cost of funds by 15 bps.³⁹

Third, raising bank capital ratios might bring system-wide funding benefits beyond the market pricing of individual bank risk. In order to illustrate this, we use the systemic measure of capital shortfall of Archarya et al. (2011).⁴⁰ Along the adjustment to higher capital ratios, we assume a gradual reversion in the systemic shortfall and individual bank contribution towards its mean over the pre-crisis period, from 2005 to 2008. The resulting path shown in Chart 1 does not seem at odds with historical trends, and the estimates are well below the peak of 2006-2007. We then translate this favourable scenario into system-wide improvements in bank funding conditions.

³⁸ The macro-financial scenarios are constructed in three layers using a DSGE model with financial frictions (see DKR (2011)) and two satellite models for bank debt pricing (see Maurin and Galiay (2015)) and interbank market network interactions (see Kok and Halaj (2014)). In the structural model, the macroeconomic transmission channel of increasing bank capital ratios implies tighter lending conditions for firms and households and significant deleveraging on core bank assets. The adverse real financial interactions at play in this estimated structural model account for historical regularities between bank balance sheet adjustments and credit provision. But specific bank strategies to cover the capital shortfall might entail lower macroeconomic costs than in the benchmark simulations.

³⁹ Maurin L. and D. Rodriguez-Palenzuela. (2011) estimate the relationship below, where i stands for the bank in the sample (51 listed banks located in the European union), INC stands for an indicator or bank income capacity, $RISK$ is measured by the average risk weight of bank assets and $Ratio$ is the CT1 capital ratio:

$$EDF_t^i = \alpha_i + \sum_{k=0}^1 \theta_k^{INC} .INC_{t-k}^i + \sum_{k=0}^1 \theta_k^{RISK} .RISK_{t-k}^i + \phi .RISK_t^i .Ratio_t^i$$

The coefficient ϕ varies between -0.13 and -0.17 depending on the indicator retained for bank income capacity (ROA, Δ ROA, RE) and the estimation method, fixed effects or random effects. Hence, taking the median estimate, 0.15, and assuming an average risk weight of 40%, a 1 p.p. higher capital ratio reduces bank EDF by 60 bps, other thing being equal. Given a pass-through of EDF to the cost of bank market debt, estimated with the same sample of banks, of 1.2, and a share of bank debt in bank liability of one-third, a 1 p.p. increase in the bank capital ratio would reduce the composite cost of funds by 24 bps.

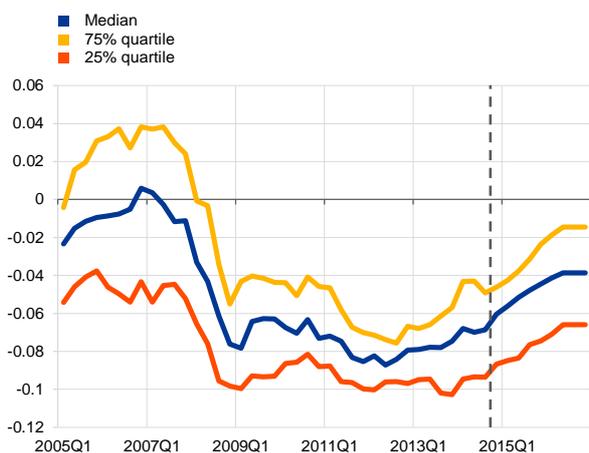
⁴⁰ The methodology assumes that a banking failure becomes a source of systemic risk only when the banking system as a whole is undercapitalised. Hence, individual firms' contribution to systemic risk can be calculated as the amount by which their capital resources fall below a certain threshold, conditional upon the system as a whole being undercapitalised.

On the price side, using cross-sectional regressions based on a sample of 40 EU banks, the bank market funding cost can be expected to decline by 90 bps compared to 2014 Q1, conditional on the scenario for the systemic shortfall (Chart 2).⁴¹ This decline in the funding cost is twice the size of that resulting from the impact of a higher capital ratio on idiosyncratic bank risk, and should be considered as encompassing it. For the purpose of the macroeconomic simulations, we will only consider, in this layer of the scenario, the funding costs relief in addition to that assumed in the previous step. Non-price effects could also materialise, as the decline in systemic risk and improved market confidence may translate into higher availability of interbank funding sources and higher propensity to borrow and lend in the interbank market. Given the uncertainty surrounding their magnitude, these effects are not considered here.⁴²

Chart 1

Illustration of the improvement in market perception, as reflected in the systemic expected shortfall

(reported to the total asset of each individual bank)

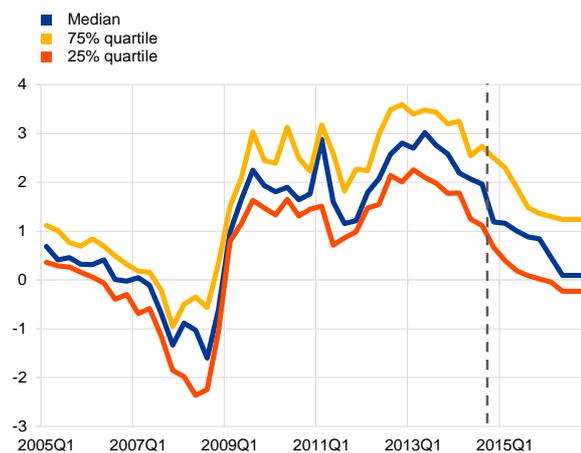


Source: ECB estimates.
Notes: See and Acharya, Pedersen, Philippon and Richardson (2011) for a detailed description of the methodology employed to measure systemic risk.

Chart 2

Spread to benchmark yield

(%)



Source: ECB estimates based on ECB and DEALOGIC.
Notes: For a description of the dataset and methodology, see Maurin L. and Galiay A. (2015). The bar represents the interquartile range of the distribution of spread for around 40 EU banks. The horizontal bar represents the median, and the dashed bar around it its distribution at the 50 per cent level.

Overall, the model simulation suggests that (i) closing the gap has a negative impact on economic activity through tighter bank lending conditions, of around 0.2% of GDP in cumulative terms over the next two years, while inflation would decline by around 0.05 p.p. on average (**dark blue bars in Chart 3**); ii) the separate macroeconomic impact of lower idiosyncratic funding costs would boost GDP by a cumulative 0.15%, thereby partly offsetting the adverse effects of bank deleveraging needs (**yellow bars in Chart 3**); iii) when accounting for system-wide funding relief and interbank re-intermediation, the positive impact could reach 0.3% of GDP in cumulative terms and 0.1 p.p. of HICP annual inflation by 2016 (**orange bars in Chart 3**).

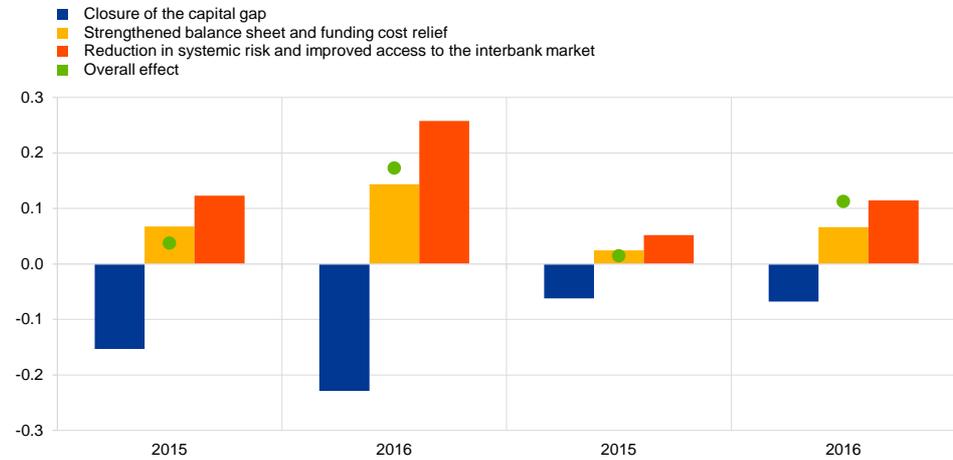
⁴¹ The elasticity is derived from Maurin L. and A. Galiay (2015).

⁴² Using the model of Halaj G. and Kok C. (2014), the improved funding conditions associated with a 90 bps reduction in bank spread tends to increase interbank funding take-up by around 2.2% and could enable banks to raise their balance sheet by 0.7%.

Chart 3

GDP impact of the comprehensive assessment of credit institutions

(as a percentage, difference from baseline)



Source: ECB estimates.

Notes: See Darracq-Pariés M., Kok-Sorensen C. and D. Rodriguez-Palenzuela. (2011).

Adding up the three layers detailed above, compared to the baseline, euro area GDP could be shifted marginally in 2015 and by 0.2% in 2016, while the inflation rate would rise by 0.1 p.p. in 2016 (diamonds in Chart 4). Such a simulation exercise is subject to considerable uncertainty, both from a methodological and economic standpoint. Should the positive effects of diminishing systemic risk and defragmentation affect all the cost of the whole liability structure of the banking sector, the positive effects on activity would be stronger. Furthermore, while the adjustment costs are transitory, the benefits would remain beyond the short term.

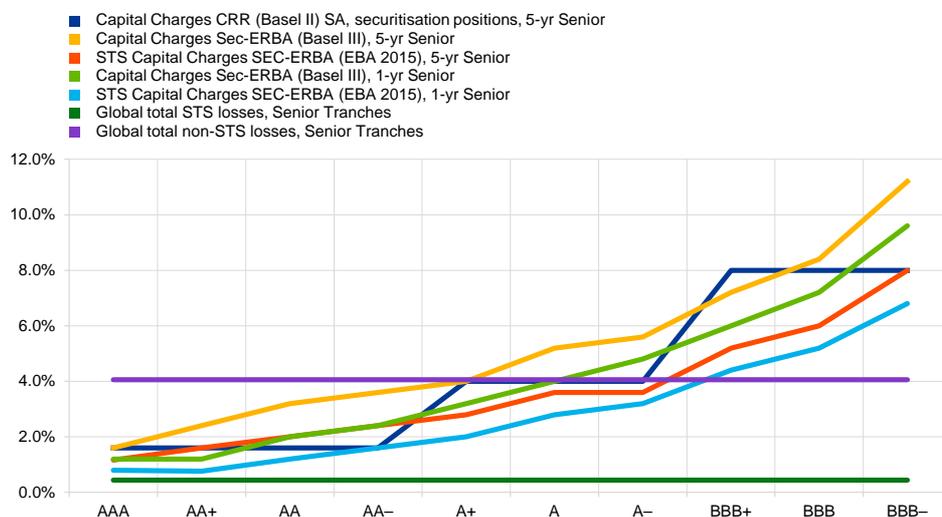
Annex 2

Comparison of capital charges under the CRR, Basel III and the EBA STC frameworks using the External Ratings-Based Approach

Chart 1 and 2 compare the Basel III capital charges for the External Ratings-Based Approach under Basel III, the current CRR (implementing Basel II) and the qualifying securitisation framework proposed by the EBA in its recommendations on qualifying securitisation to the European Commission. Several important conclusions can be drawn. *First*, the capital charges under Basel III are mostly higher than under Basel II across the capital structure, except for certain non-investment grade buckets. *Second*, EBA's proposal to lower the capital charges across the capital structure is justified, given that senior tranches of STS securitisation have incurred significantly lower losses than senior tranches of non-STS securitisations, and non-senior tranches of STS securitisations have recorded lower losses than non-senior tranches of non-STS securitisations. *Third*, EBA's proposal for STS securitisations results in generally lower capital charges for senior tranches and for longer-dated tranches, whereas it results in generally higher capital charges for non-senior tranches, compared to capital charges using the Standardised Approach under Basel II. This outcome is consistent with maintaining a prudential approach. *Fourth*, while maximum STS loss data during the crisis is not available, the low level of average losses over the last fifteen years suggests that the maximum losses would have been covered, at portfolio level, by the rescaled STS capital charges. *Finally*, the difference in capital charges for STS and non-STS securitisations in the EBA's proposal are contained and do not create undesirable cliff effects.

Chart 1

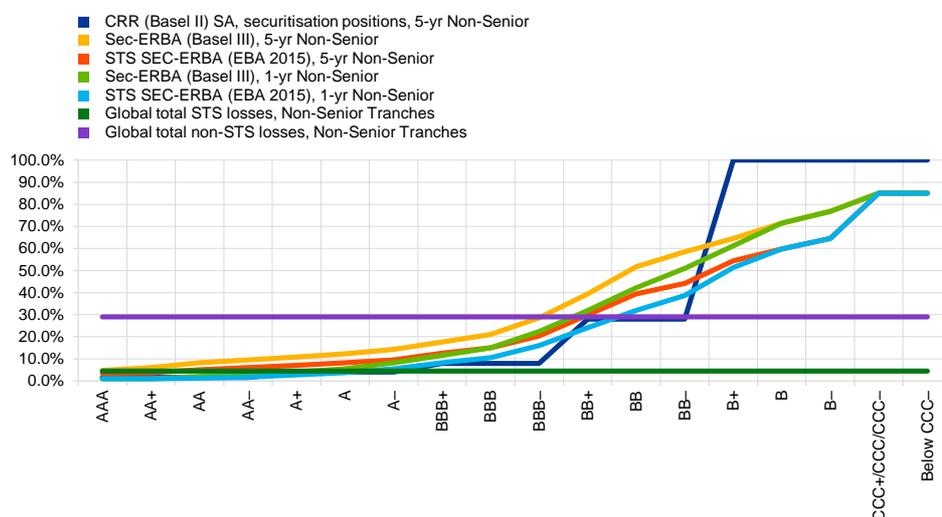
Comparison of CRR, Basel III and EBA (2015) STS Capital Charges for Senior Tranches, External Ratings-Based Approaches



Note: Global total losses are the lifetime (average) amount of losses incurred by all tranches rated by Fitch between 2000-14, for all ratings, and are expressed as a % of the initial rated balance. Total losses include both realised losses and Fitch's estimate of future losses. The losses on STS and non-STS tranches are ECB calculations based on Fitch data. These are lifetime (average) losses over the 2000-14 period for all ratings (only IG ratings are charted) and, as such, losses incurred in some years and/or in certain rating buckets are higher than the average.

Chart 2

Comparison between the CRR, Basel III and EBA (2015) STS Capital Charges for Non-Senior Tranches, External Ratings Based Approaches



Note: The calculation of capital charges under SEC-ERBA assumes a tranche thickness of 15%. Global total losses are the lifetime (average) losses incurred by all tranches rated by Fitch between 2000-14, for all ratings, and are expressed as a % of the initial rated balance. Total losses include both realised losses and Fitch's estimate of future losses. The losses on STS and non-STS tranches are ECB calculations based on Fitch data. These are lifetime (average) losses over the period and all ratings and, as such, losses incurred in some years and/or in certain rating buckets are higher than the average.

Annex 3

Options and national discretions

General considerations

The ECB is particularly committed to promoting a level playing field and financial integration, and contributing to the objectives of the Banking Union, as stated in article 1 of the SSM Regulation. For these reasons, the ECB has recently started a rigorous assessment in order to determine how to implement provisions offering alternatives and discretions in the best interests of the Banking Union. Those provisions are commonly referred to as options and discretions (O&Ds), and approximately 155 were identified in the CRR/CRD IV.

Conceptually, the existence of such O&Ds does not seem compatible with directly applicable EU law such as the CRR. Yet more than three quarters of all identified O&Ds are contained in the directly applicable Regulation. Regarding “time-limited” or transitional O&Ds, the CA showed that there were significant variations in the way CET1 capital was calculated across SSM banks. While these discrepancies will gradually diminish over the coming years as transitional arrangements are phased out, it is expected that considerable variation will remain, most notably due to the fact that a large number of O&Ds – which were not examined in the CA – are permanent.

Such O&Ds are often the result of long negotiations by lawmakers, both at European and national level, and have in some cases been fuelled by understandable concerns about how to take due account of different market structures and legal environments. But, taken together, they have material effects on the level of prudence of the framework and on the comparability of capital ratios, which make it harder for markets and the public to gauge banks’ capital strength. They also add an additional layer of complexity as well as a source of regulatory arbitrage. All of these elements ultimately impact the cost and availability of bank lending through market and regulatory pressure on the funding side. In addition, the SSM cannot supervise banks efficiently, on a level playing field, and from a truly single perspective, if there are effectively significant differences in the way EU laws are applied nationally.

Fortunately, careful analysis of current national implementation and practices has shown that convergence should not be too difficult to achieve on a majority of O&Ds. Indeed, national treatments are sometimes only the result of unquestioned traditions, and implementation is already fairly well harmonised thanks to EBA standards, but further specification is needed in order to ensure full harmonisation. Many of these O&Ds, taken individually, are also immaterial, so the cost of converging is much lower than the benefit in terms of overall consistency and the simplification of the prudential framework.

However, there are a number of considerably significant O&Ds, which require further discussion based on targeted impact studies. Material and controversial O&Ds

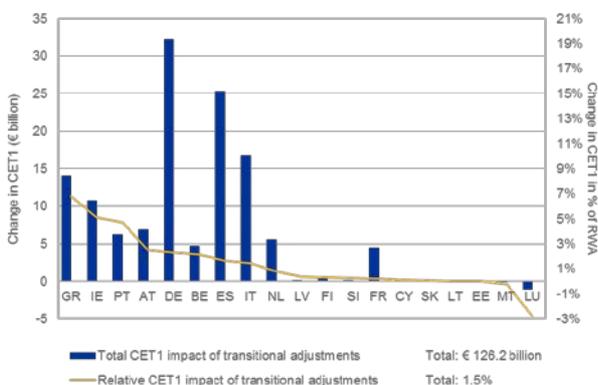
included, for instance, the treatment of insurance holdings within conglomerates for the purpose of calculating CRR capital ratios, but also the longer phase-in of the deduction of deferred tax assets relying on future profitability that existed prior to 2014.

Although the ECB’s Supervisory Board has created a prudent and consistent policy package, which will soon undergo public consultation, the limits of what can be achieved by the SSM alone should also be borne in mind. The ECB can only deal with O&Ds relating to the supervisory arena. Several O&Ds are thus beyond the ECB’s direct scope of action. Hence, the support of the legislator is also key in this process. There is clear potential for new laws that allow for greater harmonisation, eliminating O&Ds where the individual cost of convergence is offset by the benefit of a simpler, clearer and more consistent framework.

Specific examples and evidence of O&Ds affecting the cost and availability of bank lending

1. Transitional arrangements for the calculation of capital

Chart 1
Transitional adjustments



Note: Based on the transitional arrangements projected by the banks in the EBA disclosure template; Calculated based on a fully implemented CRR/CRD IV definition of Common Equity Tier 1 capital including 60% of unrealised gains/losses from sovereign exposures in the AFS portfolio.

The new CRR framework provides for more stringent rules as regards the level of capital requirements and the definition of capital.

In order to smooth the transition towards this more rigorous regime for banks, the CRR framework provides for a gradual phase-in of the new rules. Competent authorities must therefore choose, within a more or less flexible timeframe, the pace according to which capital deductions and the removal of prudential filters must be carried out until the new rules take full effect (in most cases, 2018).

As shown during the CA exercise, a major cause of the uneven playing field and lack of comparability between banks across the SSM and the wider EU, has been the different paces of convergence between countries towards the new rules.

2. Prudential treatment of insurance holdings

In the case of financial conglomerates supervised on a supplementary basis, the general rule is to deduct significant holdings in insurance undertakings from banks’ own funds. As an exception to this rule, Article 49(1) of the CRR grants competent authorities **the option not** to deduct such holdings but to risk weight them instead (100% to 370%), provided that a number of conditions are met.

From a prudential perspective, allowing non-deduction is clearly a more lenient approach that inflates the level of a bank’s own funds by allowing double gearing of

capital, meaning that one euro of capital is used to cover both banking and insurance risks. Banks not subject to supplementary supervision pursuant to the Financial Conglomerates Directive must deduct such holdings.

Supplementary supervision should neither imply a regulatory advantage nor less comparability of CRR ratios between conglomerates and non-conglomerates. Considering the current split implementation of this option in the EU and the very material impact on capital ratios for large financial conglomerates, the exercise of this option considerably skews the level playing field. The EU Commission could therefore explore the feasibility of replacing the current option with an alternative type of treatment in the CRR text. The alternative should aim to create a level playing across Europe, making the impact of using such an option more transparent but also maintaining the incentive to capitalise insurance subsidiaries, an incentive that would be reduced if the insurance capital were deducted from the bank's own funds.

3. Liquidity waivers and preferential treatment for the LCR

On 10 October 2014, the Commission adopted a delegated regulation to supplement Regulation (EU) 575/2013 with regard to the liquidity coverage requirement for credit institutions (hereafter the LCR Delegated Act, or LCR DA). Article 8 CRR grants the competent authority the option to waive - fully or partially, on an individual or sub-consolidated basis, domestically as well as cross-border in the EU - the liquidity requirements imposed by the CRR as of October 2015.

The LCR DA will also be applicable to EU credit institutions from 1 October 2015, and will provide, for the first time, an EU-wide legal framework for banks' liquidity requirements. This gives the ECB the opportunity to promote rigorous harmonisation from the initial stage of the process, as the SSM is expected to be a game-changer in terms of integration, but mindful of the fact that the Banking Union is not yet complete. There are other options with a potentially significant impact on banks' levels of compliance with the LCR, and therefore they demand attention, as inconsistent implementation of these options could severely hinder the comparability of liquidity positions across institutions, exacerbating fragmentation and potentially affecting the foundations of financial stability.

In addition, the cross-border liquidity waiver O&D significantly affects the free movement of liquidity within the SSM, as the Supervisory Board of the ECB will replace the Colleges and joint decision procedures that will take place with non-participating supervisory authorities.

Heterogeneous or asymmetrical practices in granting cross-border liquidity waivers in the EU could paradoxically result in more ring-fencing reflexes, because internal imbalances and regulatory arbitrage would ultimately hamper the level playing field, financial integration and the optimal allocation of liquidity within the EU area.

4. Large exposures exemptions

It is important to point out that, regarding large exposures exemptions, the same O&Ds are available to Member States as per article 493(3) CRR, so SSM harmonisation cannot, in any case, be fully achieved through the supervisor's action.

Article 493 provides for a transitional period until 31 December 2027 at the latest, which would call for swift action by the Commission in coming up with a legislative proposal in accordance with article 507 of the CRR.

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