



Tackling sovereign risk in European banks

This discussion paper analyses the trade-offs involved in reforming the regulatory treatment of sovereign exposures in European banks.

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Executive summary

The tight linkage between sovereign and bank balance sheets magnified the depth of the European sovereign debt crisis. As a response to this, reform efforts are therefore focused on severing this vicious tie. Some progress has been made. The Banking Union framework addresses the transfer of banking sector risk to the sovereign. Policy makers are now discussing how to address the treatment of sovereign debt on bank balance sheets. Currently, it is treated as risk free. Zero risk weights are applied, meaning banks do not need to set aside capital to protect themselves from potential losses in these securities. Nor do banks have any limits on their exposure to a particular sovereign.

European crisis was magnified by the link between sovereigns and banks.

This discussion paper analyses the two widely discussed basic options to address this regulatory gap: applying non-zero risk weights to sovereign exposures, and putting limits on exposures to sovereigns, akin to those in place for other exposures. Although this paper analyses each option in isolation, the two complement one another as they target different facets of risk. Positive risk weights address counterparty credit risk, whereas large exposure limits address concentration risk.

Two basic options for regulatory reform could address sovereign risk in banks.

Both policy options would, according to our analysis, lead to improved bank risk management and render banks more resilient. They would equip them to better absorb losses: positive risk weights would require higher capital buffers and exposure limits would lead to greater diversification. Positive risk weights would also improve risk transparency and correct distorted incentives for investing in sovereign bonds. At the systemic level, leverage would decrease and losses in the event of default would be more spread out. On the downside, both regulatory proposals would lower bank profitability in the short run. In the longer run, positive risk-weights could permanently reduce bank profits by increasing their funding costs, while exposure limits would lead to a more diversified portfolio and lower funding costs.

Both non-zero risk weights and limiting exposure to sovereigns would make banks more resilient.

The benefits in terms of increased resilience in the banking sector would come at a cost for some sovereigns. Sovereign bond holdings would become more costly in terms of capital if positive risk weights were applied or the exposures were capped by a hard limit. In both cases, banks would try to deal with excess sovereign bonds on their balance sheets by injecting fresh capital or reducing their portfolio of sovereign bonds. An increased supply of sovereign paper, or a lack of demand for new issues, would raise funding costs for the sovereign and consequently for the whole economy. Furthermore, both policy options would lower liquidity in the sovereign debt markets, as they add to the cost and hinder the ability of banks to provide market-making services. Exposure limits in particular would have significant repercussions on markets in the short run, as banks traditionally have large exposures to domestic sovereigns that they would have to shed. Other market participants would need to absorb this additional supply. Sovereigns would need to re-arrange their financing sources, which could prove challenging.

But making banks more resilient could come at a cost for sovereigns...

... and add pressure in downturns.

Additionally, the two options could aggravate long-run macro-level cyclical developments for stressed sovereigns. During an economic downturn, an increased riskiness of a sovereign would translate into higher risk weights and a higher capital charge for the bank holding its debt. This would further worsen financing conditions for sovereigns precisely at the time when fiscal space is most needed. Similarly, exposure limits could lead to cliff effects in a downturn, if sovereigns fail to extend their investor base. We expect that introducing positive risk weights would have the largest effect on stressed sovereigns, while imposing exposure limits would impact sovereigns with large outstanding debt volumes the most.

Any changes should be introduced gradually and transparently.

The trade-off between strengthening the resilience of the banking sector to sovereign risk and maintaining the investor base for European sovereigns makes the issue of adjusting regulation particularly complex. Any policy decision needs to take into account the effects it would have on sovereign funding conditions. In addition, as banks traditionally hold large amounts of sovereign debt, any regulatory change could have a large initial impact with potentially destabilising consequences. Hence, a gradual and transparent transition would be crucial for a successful implementation of any combination of the two alternatives.

1. Introduction

The link between the risks of sovereigns and their domestic banking sectors intensified during the financial crisis in many European countries. Recapitalisations led sovereigns to take on banking sector risks, while banks had incentives to increase their – in particular domestic – sovereign exposure. Private sector involvement in the Greek debt restructuring in 2012 dealt a strong blow to the Cypriot banking sector, laying the problem bare. In Ireland and Spain, a rapid deterioration of asset quality in the banking sector strained the sustainability of the fiscal accounts. This sovereign-bank nexus resulted in several countries needing financial assistance.

Reform efforts since the crisis have focused on introducing firewalls into the system. Several policy initiatives address the channel of bank risk spilling onto sovereign balance sheets. Most importantly, the bail-in requirement in the Bank Recovery and Resolution Directive (BRRD) renders bank bailouts by the state virtually impossible.¹ Furthermore, higher capital requirements and increases in so-called loss absorption capacity have generally increased the resilience of banks, and, in particular of systemic institutions. At the institutional level, backstops were set up to guarantee an orderly unwinding of systemic banks without straining the sovereign: a Single Resolution Mechanism including a dedicated financing arrangement, an ESM loan facility for the banking sector restructuring, and, an ESM instrument to directly invest in banks.

The transfer of sovereign risk to bank balance sheets has so far not been addressed, despite extensive reforms in bank regulation over the past 5 years. Sovereign exposures de facto receive a zero risk weight in EU legislation and are exempted from limitations on concentration risk. Regulation treats sovereigns as risk-free. This circumstance is usually justified by historical ties between the sovereign and the domestic banking sector. In addition, it is believed that domestic banks are the only reliable source of funding of the sovereign in times of crisis.

More recently however, the discussion on an adequate management of sovereign risks on bank balance sheets has picked up. In March 2015, the European Systemic Risk Board (ESRB) published an extensive report on the treatment of sovereign exposures including several policy options.² The Basel Committee has set up a task force which is due to publish recommendations by June 2016.³

With this paper we aim to add to the policy discussion by assessing the likely effects of two basic policy options, (1) applying non-zero risk weights to sovereign bond holdings and (2) applying large exposure limits also to sovereign exposures. In our analysis we focus on these two basic options to illustrate clearly what the potential costs and trade-offs are. With this we also aim to provide a basis for calibrating more complex alternatives that could ease the negative aspects of these two basic options.

1 The bail-in requirement is binding from January 1, 2016.

2 See ESRB (2015).

3 Unsatisfied with the regulatory inertia at the international level, some jurisdictions have also moved on their own. In October 2015, the Swedish FSA announced that it would require its four largest banks to apply positive risk weights on their sovereign exposure after it had already implemented capital requirements on sovereign exposures one year earlier under the pillar 2 requirements.

Given the close ties between the sovereign and the banking sector, any regulatory change could have a large initial impact. Banks traditionally hold particularly large amounts of sovereign debt, which implies that unwinding this relationship may result in a considerable rewiring of financial architecture in some countries. It is not uncommon for the euro area banking sectors to hold around 20-30% of their domestic sovereign outstanding debt. Furthermore, among the banks in the EBA 2013 transparency exercise, 60% of total sovereign exposure was with the domestic sovereign. Any change to that set of incentives would cause a structural break that could imply costs. In the current environment, which is still marked by legacies of the crisis, those costs could have a destabilising effect. Hence, a gradual and transparent transition would be crucial for a successful implementation of any regulatory change.

By looking at some stylised facts and analysing how the banks would adjust in the transition to the new regulatory regime, we attempt to give an idea of the magnitude of the transition effects. Our calculations show that introducing sovereign exposure limits would have a significant impact on countries with large outstanding public debt. For example, applying large exposure limits on a sample of the largest EU banks' sovereign holdings would result in € 275 billion in extra supply of sovereign bonds on secondary markets. This represents nearly 3% of the EU's outstanding sovereign debt. Applying non-zero risk weights for sovereign exposures based on their riskiness as assessed by credit rating agencies or internal models would affect banks in programme/post-programme countries the most. The largest EU banks would need an additional € 31 billion in fresh capital. Moreover, the programme/post-programme countries would be most affected in terms of their funding conditions.

In addition, we provide a qualitative assessment of what the two basic options for regulatory treatment of sovereign exposures could achieve and what their broader macroeconomic and market consequences would be. The main conclusions are as follows. On the banking sector side, both positive risk weights and exposure limits would deliver beneficial results in terms of banks' resilience to sovereign risk, by improving the ability of banks to absorb losses and limit the accumulation of excessive risks. Neither of the two options could however guarantee complete loss absorption in the case of sovereign default. While positive risk weights would also improve the risk transparency and correct distorted incentives for investing in sovereign bonds, sovereign exposure limits would not deliver these specific results. At the systemic level we would see a decrease in leverage, more spread out losses in case of default and consequently more resilient banks. At the same time, a more diversified portfolio creates a higher probability of contagion. As regards bank profitability, both regulatory proposals would result in lower profit generating capacity at systemic level in the short-run, with a neutral effect for those banks that do not need to significantly change their current business model. In the longer run, we expect that the more diversified fixed income portfolio would be reflected in lower funding costs in case of the large exposure limit, whereas positive risk weights would permanently reduce banks' profits by increasing funding costs.

The benefits in terms of increased resilience of the banking sector could come at a cost for some sovereigns. First, both policy options may lower liquidity in sovereign debt markets, as they affect the cost and ability of banks to warehouse sovereign paper and provide market-making services. Second, in the transition phase, banks would try to deal with excess sovereign bonds on their balance sheets by injecting fresh capital or by rebalancing their portfolio of sovereign bonds. The increased supply of sovereign paper or lack of demand for new issues would raise the funding cost of stressed sovereigns or those with large outstanding debt volumes. Third, with banks paring down their sovereign exposures, the governments would need to move towards a more diversified investor base. Finding new investors could prove difficult, in particular for more stressed sovereigns and those with illiquid sovereign debt markets. Additionally, a broader investor base could imply more volatility and a higher risk premium. Fourth, once in place, both options could aggravate financing conditions for the sovereign in the downturn. Risk weights would increase in recessions or periods of stress for the sovereign and limit a country's fiscal space precisely at the time when the sovereign would need to support the economy.⁴ Such regulation would thus lead to pro-cyclical effects at the macro level. The effects of sovereign exposure limits could be similar, even if they do not move with the cycle by themselves. Exposure limits could lead to cliff effects in the downturn, if they become binding due to increased sovereign financing needs and if the sovereigns fail to find new investors. Fifth, while bank lending to the private sector could increase after the introduction of either of the two regulatory changes, the size of this effect is uncertain, and conditional on demand. At the same time, an increase in the cost of funding for stressed sovereigns is expected to be translated to more expensive financing for the whole economy. Finally, positive risk weights could lead to sovereign bond prices that better reflect the underlying risks. On the other hand, sovereign exposure limits would penalise countries with a larger nominal stock of debt and distort prices.

The significance of the presented findings calls for carefully designed transition arrangements. Reforming the regulatory treatment of sovereign exposures of banks affects important elements of banks' asset and liability structure. It also affects the funding of sovereigns in a significant manner. All of this calls for transitional phases that would help avoid abrupt shocks to markets, pricing and sovereign funding conditions.

The structure of the paper is as follows. Section 2 gives an overview of current regulatory arrangements and the treatment of sovereign risk. In Section 3, we set out the specific objectives that a potential change to regulation might have. We also briefly address what has already been done on other fronts to achieve these objectives. Section 4 discusses the introduction of positive risk weights for sovereign exposures while Section 5 discusses large exposure limits for sovereign bonds. Section 6 reviews transitional arrangements and Section 7 concludes.

4 This implication is more important for countries with little fiscal space.

2. Current arrangements

In this section, we first explain the current regulation on risk weighting and current diversification requirements, the underpinning rationale, and, their implementation in EU law. Subsequently, we discuss banks' motivations to hold sovereign exposures and provide a short overview of the current holdings of sovereign exposures and shed some light on developments over the past years.

The underlying rationale of risk weighting exposures

Basel II introduced the notion of risk weighting exposures according to credit risk in order to better adapt the capital holdings to the actual capital impact in case of default and to prevent the excess build-up of risks. The idea of loss-absorbing capital is based on the concept that expected losses represent a normal cost to banks. Unexpected losses that exceed the normal threshold of expected losses are to be absorbed by capital and capital levels need to be set to the Value at Risk level that the supervisor is willing to accept.⁵ The underlying model should be portfolio invariant, meaning that the capital required for each exposure should only depend on the risk that this exposure represents to the bank.

The Basel framework allows for two possible approaches to risk weighting. For smaller domestically active banks, and, for small non-significant exposures, the Standardised Approach (StA) assigns risk weights to buckets of similar risk. The buckets that apply to specific exposures are tied to external ratings assigned by so called ECAI (External Credit Assessment Institutions) such as credit rating agencies (CRA).⁶

The Internal Risk Based (IRB) approach allows for a more nuanced treatment, by relying on banks' internal rating models.⁷ Banks use them to generate continuous risk parameters for each exposure, which subsequently determines the risk weight and the appropriate capital allocation to this exposure. Usually banks can reduce their risk weighted assets by switching to the IRB approach because they can compute the risk weight for each asset class individually.

The Basel framework requires banks that are using the IRB framework to apply this framework consistently to the majority of the exposures they hold on their balance sheet. It makes exceptions for asset classes that are immaterial in nature and for non-significant business units, for which it allows the application of the standardised approach.

5 See Basel Committee on Banking Supervision (BCBS) (2005).

6 The weights assigned to the buckets range from 0% to 150%.

7 In this discussion paper the acronym IRB will refer to both the foundation and advanced variants. The main difference is that banks that apply foundation IRB (F-IRB) are allowed to determine their own probability of default for each borrower while banks applying advanced IRB (A-IRB) also determine the Loss Given Default and Exposure at Default values themselves on an exposure-by-exposure basis. The models that banks use to do this require supervisory approval.

Current treatment of sovereign risk in EU legislation

The Capital Requirements Regulation (CRR) and the Capital Requirements Directive IV (CRD IV) implement Basel III standards into EU regulation.⁸ They are part of the broader “single rulebook” effort aimed at harmonising financial sector regulation in the European Union. The CRR as a regulation applies directly to banks in the EU while the CRD IV requires previous implementation into national law by member states. Most of the capital standards are fixed in the CRR but some require Implementing Technical Standards (ITS) to be issued by European Banking Authority (EBA) or by the Joint Committee of European supervisory bodies.

While the CRR in principle foresees positive risk weights for sovereigns, its Article 114(4) stipulates that sovereign bonds issued in the own currency of the sovereign can be assigned a zero risk weight.⁹ The original rationale was that a sovereign exposure in the domestic currency is essentially risk-free because in case of default, the central bank is always able to fulfil the sovereign’s commitment to an unlimited amount. However, the CRR ignores the fact that in the EMU the fiscal authority has no influence on the (common) monetary authority. In addition, the Treaty on the Functioning of the European Union prohibits monetary financing in Article 123.

In the context of monetary union, this exemption implies in practice that any euro area bank may apply a zero risk weight to any euro area sovereign. In addition, there is a transitional arrangement (Article 114(5)) that allows a zero risk weight for any bonds issued by any EU member state, irrespective of the currency, until 31 December 2017.

The CRR/CRD IV framework extends this exemption to IRB banks. In principle, the exemptions of Article 114 should not affect the treatment of IRB banks (and hence of any major EU banks) since they apply specifically to StA. However, CRR Articles 148 and 150 allow competent authorities¹⁰ to grant banks the right to deviate from the IRB approach for a number of exposures. This allows major banks to permanently apply the StA to all sovereign exposures.

This “permanent partial use” exemption in combination with the exemptions assigned to the standardised approach in Article 114 for sovereign exposures leads to a situation whereby EU banks effectively do not have to hold any capital for exposures to EU sovereigns. Furthermore, in order to assure a level playing field, the CRR allows the application of zero risk weights on any sovereign exposure if the domestic supervisor of that sovereign allows for this. This means that the lenient treatment of sovereigns domestically propagates throughout the entire European banking system.

BCBS (2014) notes that this has material implications for a sample of large EU banks. In a sample of 20 major EU banks, they find significant amounts of sovereign EU exposures and, as a result, the exposures that are subject to permanent and temporary partial use exemptions reach 9% of total balance sheets.¹¹ Considering that this treatment leads to materially lower capital holdings than would be prescribed by Basel III, the Basel Committee grades the CRR/CRD IV to be materially non-compliant with Basel III in respect to the credit risk approach.

8 Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

9 This principle was already part of Basel II.

10 From the CRR text it is not clear whether competent authority relates to the regulator or to the supervisor.

11 BCBS (2014) uses data as of end-2013.

Current regulation on large exposures

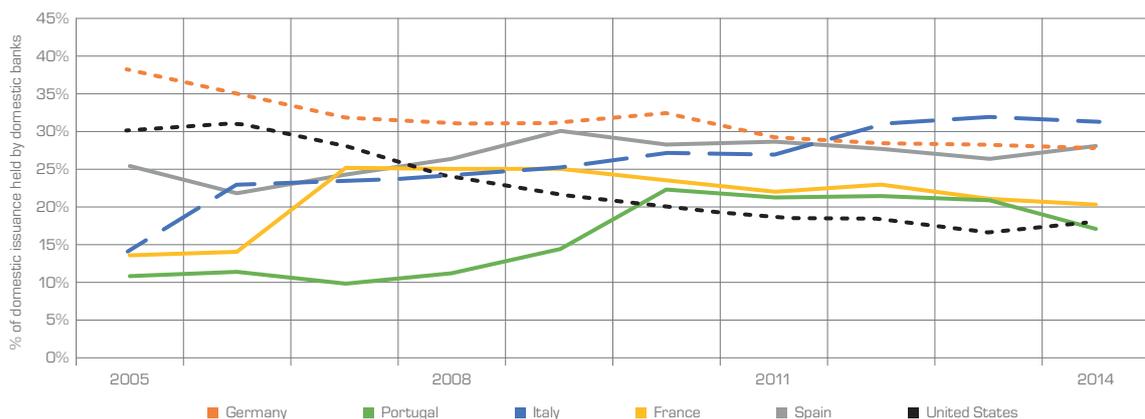
The large exposures framework complements the risk-based capital standards. It is designed to protect banks from large losses resulting from the sudden default of a single counterparty. In addition, the calculation of capital requirements implicitly assumes that banks hold infinitely granular portfolios, which implies that no form of concentration risk is considered.¹² Imposing large exposure limits would assure that this assumption holds.

In the CRR, Article 395 requires banks to monitor and control their large exposures in a way that ensures diversification of the bank's holdings and avoids systemic risk associated with excessive exposures to any given counterparty. To avoid risk concentration, current regulation therefore limits exposures to any counterparty to 25 percent of own funds. However, Article 400 exempts domestic and other 0-percent risk-weighted government bonds from large exposure limits.¹³

Motivation of banks for holding sovereign bonds and implications

As one of the main pillars of financial intermediation, banks have for a long time had a dominant position in sovereign debt markets. While this role is changing as financial markets are developing and becoming more diverse and sophisticated, banks remain an important player and represent a large share of demand for sovereign bonds. In euro area countries, banks frequently hold between 20-30% of outstanding debt of the domestic sovereign. Figure 1 shows the developments of holdings of domestic debt by banks for selected countries. Domestic banks in countries that traditionally held large shares of domestic debt like e.g. Germany have reduced their holdings over the past years, while in some peripheral countries, like Portugal for example, holdings have gone up. In the United States the share of domestic debt held by the domestic banking sector stood at 30% in 2005 but has fallen to below 20% since. This could be related to the quantitative easing of the Federal Reserve over this period of time. In the United Kingdom, banks held only 12% of domestic sovereign debt in 2014. At the same time, the financial sector as a whole held more than 60%.

Figure 1: Share of domestic sovereign debt held by domestic banks



Source: Eurostat, ECB, Federal Reserve Board

There are different characteristics of sovereign bonds that make them attractive for banks to hold. Some of these reasons may be permanent and structural in nature while others are temporary.

12 For more details, see <http://www.bis.org/publ/bcbs283.pdf>, Standards of the Supervisory framework for measuring and controlling large exposures, BIS, April 2014.

13 The regulation links the exemption to the exposure limit to the 0% risk weight that competent authorities attach to the sovereign exposure. Hence, if one would attach a positive risk weight to sovereign exposures, this would imply the application of the exposure limit cap.

Sovereign exposure is generally less costly than other assets. First, since it is considered to be low-risk, it can be used to de-risk the balance sheet and lower the bank's funding costs. However, this effect may weaken if the financial situation of the sovereign deteriorates as markets will not perceive the sovereign as risk-free.¹⁴ Capital regulation and the zero risk weight add to the cost advantage. Korte and Steffen (2015), for example, calculate the "sovereign subsidy" (in terms of a reduced capital need), amounting to € 750 billion for a sample of 54 large European banks in 2013.¹⁵

The cost advantage in terms of capital may have played more strongly in recent years. Banks that were under pressure over the past years to increase their capital adequacy ratio partially rebalanced their portfolio to sovereign bonds (see Figure 3). In this way, the pressure on capital ratios emerging from deteriorating asset quality and their impact on risk weights was mitigated without resorting to more expensive capital raising. This implies that even if banks reshuffled their portfolio towards sovereign bonds to relieve pressure on capital ratios, they did not actually deleverage.

The liquidity of some sovereign bond markets and the fact that sovereign bonds can be used as collateral to access central bank liquidity also render them attractive for banks. Since sovereign bonds typically qualify as eligible assets, they are used in repo transactions with central banks and banks always keep a certain amount of sovereign bonds in their balance sheet. Apart from central bank eligibility, they also qualify as High Quality Liquid Assets (HQLA) in the Liquidity Coverage Ratio (LCR) requirement that was introduced under Basel III. Furthermore, there may be close substitutes (e.g. cash, covered bonds, etc.) that could or already do replace sovereign paper in this function but may come at a cost. The floor to banks' demand for sovereign bonds is determined by liquidity regulation. The LCR ratio that was introduced in Basel III requires banks to hold HQLAs equalling at least the net outflows that occur over a 30-day period.¹⁶ It is still safe to assume that most of the HQLA that banks hold will consist of government bonds, in particular if other assets like for example cash are more costly to hold.

These motivations create a close connection between the balance sheet of banks and that of the sovereign. While some of these motivations are inherent in the banking system, others are promoted by regulation. Normally this connection does not pose a particular issue but in times of crisis, it may lead to concrete losses for the banking sector.

For example, over the past 5 years many banks engaged in the so-called "carry trade" where they were benefitting from accommodative monetary conditions and high returns on risky sovereign bonds. Acharya and Steffen (2013) show that a number of European banks in 2010 stocked up on peripheral European sovereign bonds. Beyond the already ample liquidity injection since the onset of the crisis, the ECB gave additional support to this in 2011 with their extensive Long Term Refinancing Operation (LTRO), which provided € 1 trillion in funding to the banking sector. For banks the rationale was clear: in case euro area sovereign yields were to converge again, banks would benefit from the price increases. Figure 2 provides an aggregate view of this for the Portuguese banking sector by contrasting bank holdings of sovereign debt and their liabilities to the Eurosystem. The figure shows how the developments of central bank liabilities and sovereign bond holdings were closely aligned during the apex of the crisis. During this time, Portuguese banks were scrambling to find sufficient liquidity to secure their funding.

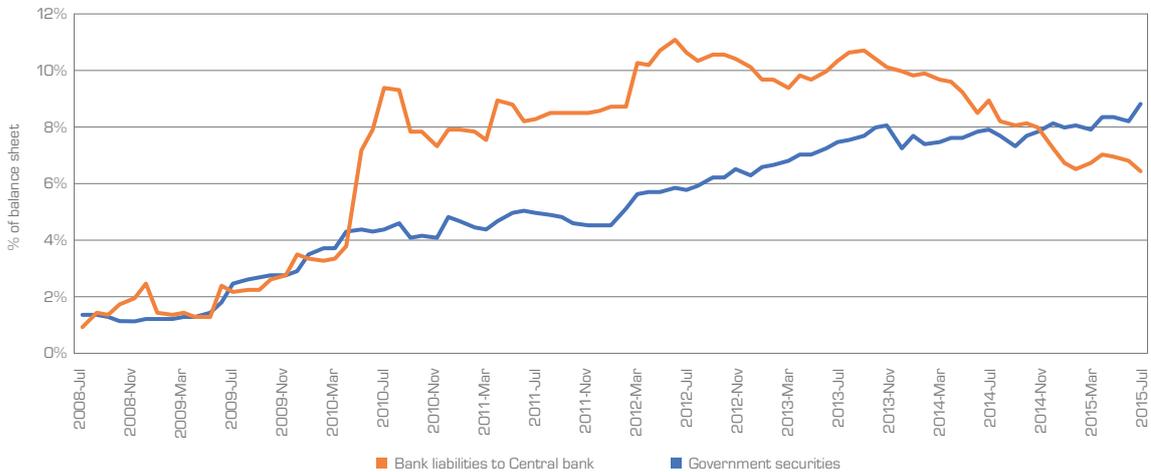
14 See for example Committee on the Global Financial System (CGFS) (2011). Also, Acharya and Steffen discuss in great detail the extreme case of Dexia group which before its decline held a sovereign bond portfolio as large as a third of their balance sheet (€ 203 billion out of total assets of € 630 billion). Simultaneously, they had financed a large part of this (€ 260 billion) via short-term debt. Eventually, investors decided that this portfolio was too risky and quickly withdrew the funding (See Acharya and Steffen (2013)) which led to the group's demise.

15 Obviously these types of calculations are very sensitive to the assumptions made regarding the level of risk weights. See also a more elaborate description of Korte and Steffen (2015) below.

16 See BCBS (2013). For most banks the so called LCR ratio needs to equal 100% as of 2015. Some banks have an extended transition period until 2017.

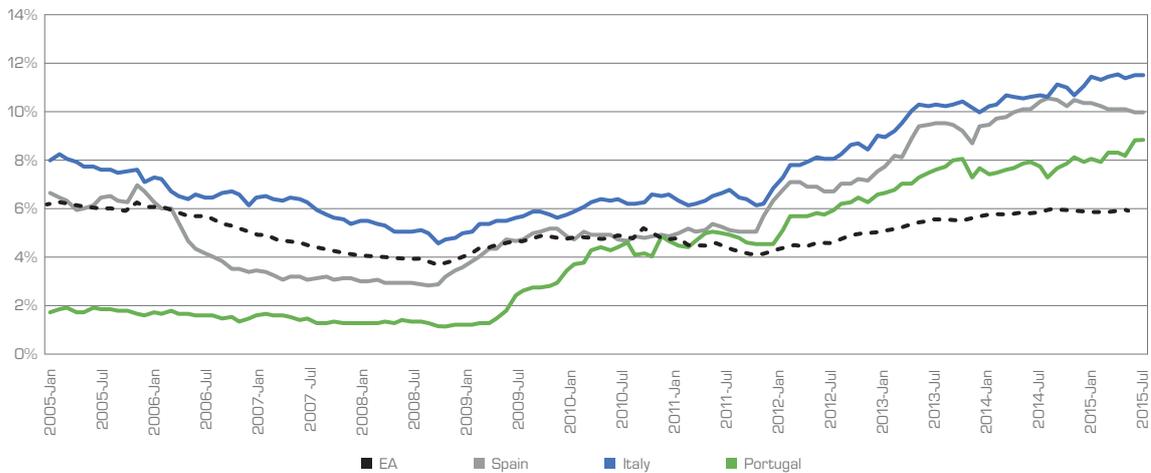
The Greek debt restructuring in February 2012 shattered the illusion that sovereign debt was risk-free and banks that had engaged in the carry trade using Greek sovereign debt suffered a direct haircut on their holdings. Cypriot banks for example, which held significant exposures to the Greek sovereign, made large losses which led to the subsequent bail-in of depositors.

Figure 2: Holdings of sovereign bonds of Portuguese banks and their liabilities towards the European system of central banks



Source: ECB

Figure 3: Holdings of sovereign bonds (any country) as share of balance sheet total in Portugal, Spain and Italy



Note: Figures represent market prices. While the market value of Portuguese debt dropped by 10% below its face value in early 2010, for Spain the drop was less pronounced (-4%). In both countries the market value recovered quickly thereafter.

Source: ECB

Beyond the immediate credit risk, banks' holdings of vulnerable sovereigns can suffer from mark-to-market losses in the Available-for-Sale and trading books. This fact led to significant criticism of the 2011 stress tests of the European Banking Authority (EBA) as banks had "parked" a significant share of their sovereign exposures in the banking book. This protected the exposures from price changes that would have led to larger losses in the adverse scenario of the stress test.¹⁷ Later on, the EBA changed its methodology requiring more of the sovereign exposures to be marked-to-market.

17 See for example: <http://www.bloomberg.com/news/articles/2011-07-17/stress-tests-missing-sovereign-default-fail-to-convince-analysts>.

The “home bias” in sovereign debt holdings

Banks may have incentives to hold domestic sovereign paper in particular. This preference became particularly visible across European countries after the onset of the financial crisis. Many possible explanations have been proposed for the so-called home bias. However, they often remain case-specific and none of them provides a general explanation. Many explanations are related to situations in which the likelihood of a sovereign default increases.

It has been suggested that political pressure from national debt management offices during the crisis may have led banks to hold additional sovereign exposure. In particular, treasuries in countries with weak fiscal accounts, which experienced high yields in secondary markets may have asked their domestic banking sectors for help. Broner et al. (2014) also suggest that when the risk of sovereign default increases, the expected return for domestic creditors is higher because they are more likely to be compensated in case of a selective default.

Furthermore, banks may keep more domestic sovereign bonds to hedge against redenomination risk.¹⁸ Increasing financial difficulties in stressed countries amplified concerns of the euro area’s collapse. The rising likelihood of redenomination of the domestic currency could have contributed to a substantial accumulation of domestic sovereign bonds in euro area countries. Moreover, banks hold large amounts of the domestic sovereigns also for purposes of geographic matching of assets and liabilities. In addition, banks may overinvest in domestic sovereign bonds due to their relatively higher supply. Deteriorating macroeconomic fundamentals typically lead to larger fiscal deficits and increasing public debt issuance. The excess supply of government bonds is at least partly absorbed by the domestic banking sector. The absorption may have also increased during the crisis due to the retrenchment of the foreign investors (Asonuma et al., 2015). Also, the fear of spill-overs from the sovereign may induce self-preservation behaviour on the part of banks, where they prefer to invest in the domestic sovereign in an attempt to reduce the probability of default of the sovereign (Erce, 2015).

18 See ESRB (2015).

3. Objectives and scope of the change in regulation

From a risk management perspective, the case for an adjustment of regulation would be clear. The actual risk of sovereign exposures and the corresponding costs in terms of capital should be taken into account when making portfolio choices. For instance, as long as the risk weight on sovereign bonds is zero, the return on these bonds is not risk adjusted and leads to distorted incentives. This can lead to excessive risk-taking in order to reap benefits of positive yields without any cost of capital (carry-trade). At the same time, an insufficient capital buffer leaves banks vulnerable to sovereign risk. There is also a need to address the risks stemming from the concentration of sovereign holdings. The regulatory change addressing these issues directly also affects the systemic risk in the banking sector.

The main driver of the renewed debate on regulatory treatment of sovereign exposures is, however, a broader issue of the sovereign-bank nexus that has strengthened during the crisis and pushed countries close to financial collapse. Reforming the regulatory treatment of sovereign exposures aims at mitigating the negative effects of the sovereign-bank feedback loop. Introducing regulatory change that strengthens banks' resilience to sovereign risk and improves risk transparency would help to reduce the transfer of sovereign risk to bank balance sheets. At the same time, the changes in regulation should be designed in a way that does not impair the stability of the sovereigns.

The specific goals of regulatory reform, relate mostly to the banking sector itself:

- 1) **Increasing banks' resilience to sovereign risk** by improving the ability to absorb losses via adequate capital buffers and reducing the home bias via better diversification of fixed income portfolios of banks.
- 2) **Improving risk transparency**, which promotes correct incentives in portfolio allocation and consequently limits the build-up of risks.
- 3) **Reducing systemic risks in the banking sector** by preventing fire-sales and spill-overs, preserving bank profitability, decreasing bank leverage and generally severing the sovereign-bank nexus.

At the same time, the regulatory treatment of sovereign exposures inevitably affects sovereign funding conditions and by extension, the cost of financing in the economy. We list additional desired (or desirable) outcomes of the regulatory reform:

- 4) **Avoiding price distortions** on the sovereign bond market.
- 5) **Maintaining liquidity in sovereign debt markets**, also in the light of banks' provision of warehousing and market-making services to the sovereigns.
- 6) **Avoiding crisis amplification for vulnerable countries** that could occur due to worse financing conditions or bank resolution costs. No comparative disadvantage for EA/EU sovereign debt issuers.
- 7) **Potentially support lending to the real economy** and thereby facilitating economic recovery.

No reform will achieve all of these objectives at once. Europe has been active on other fronts to address some of the issues that are mentioned in the objectives above. Most notably, the BRRD that became binding in 2015 and 2016, deeply reformed the way in which banks are resolved and restructured and how national agencies coordinate in cross-border settings. One of the major changes was the introduction of bail-in, which requires shareholders and creditors to cover the costs of resolution. According to the BRRD, losses and resolution costs must now be covered by bailing in all unsecured liabilities except insured deposits. For the latter, the deposit guarantee scheme may be required to cover. Only after 13% of the balance sheet has been bailed in, the resolution authority may look for alternative sources of funding (including for example state aid).¹⁹ This lowers the bearing of contingent liabilities on the state budget considerably.

Bail-in only works well if a crisis is not systemic and markets are not generally in turmoil. In order to reduce the risk of crises, the general institutional setup of supervision has been strengthened. The supervision and resolution of systemically important institutions have been moved to supranational-level, with the inception of corresponding new institutions, the Single Supervisory Mechanism (SSM) and the Single Resolution Board (SRB). Capital requirements have been overhauled and generally increased. Additional buffers apply for specific risks and the macroprudential perspective has been added to the toolkit. A number of supervisory soundness checks, including the asset quality review of the SSM and EBA and the EBA transparency exercises and the Supervisory Review and Evaluation Process, have been applied to screen the portfolios of banks and improve their resilience.

Other aspects of the regulatory change should be kept in mind. Two important aspects are the geographical and material scope of the change in regulation. First, in terms of geographical scope, if the new regulation is to be applied at the EU level, effects are slightly different for the non-EA members of the EU. Banks outside the EA would face additional foreign currency risk when rebalancing their portfolios and, similarly, the non-EA sovereigns would have bigger problems finding alternative investors. Moreover, changing the regulation only at the European level and not globally would be suboptimal if it implies a disadvantage for European banks and sovereigns. Ideally, the new regulation should not give EA/EU banks a competitive disadvantage compared to other banks in terms of funding costs or profit generating ability. Similarly, it should not introduce a competitive disadvantage for sovereigns in terms of financing conditions.

Second, in terms of the material scope, it should be well defined whether 'sovereign exposure' includes exposure to the central government (CG) only, to the general government (GG) or it includes also exposure to the local/regional governments, government guarantees and central bank (CB) deposits. The qualitative analysis in this discussion paper assumes that the new regulation would apply to sovereign exposures excluding CB deposits. Further definition is necessary in the quantitative part, including simulation exercises, where we also provide exact definitions. For ease of reference, hereinafter 'sovereign bonds' and 'sovereign exposures' are used interchangeably, except when specified differently.

¹⁹ The BRRD requires a minimum bail-in of 8% of total liabilities plus own funds. However, the resolution authority may decide to exempt certain liabilities from bail-in and cover the incurred losses with contributions from the resolution fund. The minimum amount of bail-in could then potentially reach 13% of total liabilities plus own funds.

4. Introducing positive risk weights

The general idea of any reform would be to move closer to the objectives laid out above while mitigating the fallout from the transition. We analyse the implications of the removal of zero risk weights for banks and the effects on sovereign debt markets, where banks have an important role as investors and market makers. Next, we discuss the implications for the sovereigns and their funding options.

Impact on banks

Currently banks can hold (EU-) sovereign debt without accounting for the risk that they load onto their balance sheets. The introduction of positive risk weights on sovereign bond holdings would attach a cost in terms of having to reserve some regulatory capital for their sovereign exposures. We discuss introduction of positive risk weights by applying in full either the StA or IRB approach.

Introducing positive risk weights by imposing the StA would not make a large difference in risk weights for highly rated euro area sovereigns. In some cases, however, like for peripheral euro area sovereigns, the impact could be quite large. Table 1 shows that 7 out of 19 countries would retain a zero risk weight while for the rest risk weights between 13% and 150% would apply.²⁰

The regular Standardized Approach would lead to more transparency regarding the credit risk of sovereign exposures. At the same time, the reliance of the StA on credit ratings has a number of shortcomings. First, CRA ratings tend to be backward looking. Second, they tend to be optimistic in good times and overly negative in the downturns. Finally, downward adjustments are often abrupt.²¹ In addition, the StA is fairly blunt on its own terms, since it follows a bucketing approach. For example, a downgrade of a given asset from one credit quality step to the next could lead to a significant jump in the risk weight. These characteristics combined lead to many issues including cliff effects that exacerbate the impact of pro-cyclicality.

To improve on the issue of discrete jumps, Basel II already foresees the IRB approach²² whereby banks use their own internal models to compute risk weights in a continuous manner. This avoids cliff effects by assigning a specific and continuous probability of default (PD), Loss-given-Default (LgD) and Exposure-at-Default (EaD) to every asset class and based on this would assign a small, albeit positive risk weight accordingly. This would cause the need for a positive allocation of capital to each exposure. Table 2 below gives an illustration of how risk weights could look as a function of the assigned probability of default.²³

For example, assuming a bond with a probability of default of 0.1% for a given sovereign would lead (according to Table 2) to a risk weight of around 30%. This would mean that for each euro invested in such a bond, and assuming a regulatory capital ratio of 8%, the bank would have to hold $(30\% \times 8\% \times 1\text{€}) = 2.7 \text{€}$ -cents of capital. This would still be below the threshold that the new Basel III leverage ratio of 3% imposes on banks. If the probability of default would be multiplied by 10 to 1%, the capital requirement would increase to 7.4 € cents.

20 The date of the ratings used in computing the StA risk weights in the table is October 5, 2015. The table uses an equal weighting for the ratings of all four major rating agencies.

21 The shortcomings of CRA ratings led to the policy initiative to reduce reliance on the CRA ratings in standards, laws and regulations, proposed and discussed in a number of fora, including the FSB, G20, EU bodies and BCBS.

22 The IRB treatment was introduced in Basel II and did not change in Basel III.

23 The table was taken from BIS (2014). The formula for the risk weight assumes an LgD of 45% and an average maturity of 2.5 years.

As opposed to the standardised approach which bundles risks in buckets, the IRB approach is based on a continuous function depending on the assumed PD, LGD and average maturity. Hence, any continuous change in any of these parameters will lead to a change in the capital cost of holding this asset.

Table 1: StA risk weights on EA sovereign exposures under the StA approach

StA risk weights on EA sovereign exposures			
DE	0%	PT	88%
FR	0%	GR	150%
NL	0%	CY	100%
AT	0%	SK	20%
FI	0%	SI	40%
LU	0%	MT	28%
BE	0%	EE	13%
IT	43%	LV	20%
ES	43%	LT	20%
IE	28%		

Source: ESM calculation based on ratings of the 4 major rating agencies and the JC Credit Quality Step mapping as per CRR Art. 136 and JC/CP/2014/01add

Table 2: Illustration of risk weights under the IRB approach as a function of the probability of default

Probability of default (%)	Risk Weight (%)
0.01	7.53
0.05	19.65
0.10	29.65
0.25	49.47
0.50	69.61
1.00	92.32
5.00	149.86
10.0	193.09

Source: Bank for International Settlements (2013), BIS Quarterly Review, December 2013

The use of positive risk weights would represent a consistent approach to risk management. For the bank, this would mean that it holds enough capital to cover even unexpected losses that could occur on this exposure, in the case of IRB subject to the confidence level accepted by the supervisor. At the same time, as noted by Gros (2013) "lumpiness" of sovereign risk poses an issue in this respect. The term "lumpiness" points to the empirical fact that sovereign defaults are rare, but when they occur, losses are typically large.²⁴ Thus, even relatively high risk weights fail to guarantee full loss absorption in the case of sovereign default.

The application of non-zero risk weights to sovereign exposures would create the scope for cost optimisation with regard to holding specific sovereigns and could lead to substitution effects, since all sovereigns would no longer carry a zero risk weight. Banks would seek to reduce their costs of holding sovereign exposures subject to other motives they have for holding a specific bond. For example, potential political motives of holding the domestic sovereign would suddenly compete with the cost that holding this exposure implies. Introducing proper risk weighting of sovereign exposures would hence have the potential to weaken the link between banks and their domestic sovereign.

²⁴ For example in the Private Sector Involvement in Greece in 2012, the average haircut on Greek sovereign debt was just above 53%.

Adjustments in bank balance sheets – the transition and the steady state

An introduction of non-zero sovereign risk weights, either based on the CRA ratings or internal calculations following the IRB approach would lead to an increase in the Risk Weighted Assets (RWA). This would happen both, in the transition period when the regulatory changes are being phased in and also in the long run, whenever there would be an increase in the riskiness of any sovereign held in the banks' portfolio that would imply an increase in risk weights. Higher RWA will lead banks to either look for more capital or adjust their portfolios and/or their balance sheet size. Note that the size of the effect will be larger for banks with large exposures to peripheral/stressed sovereigns with low ratings. Due to the home bias in sovereign bond holdings, these are currently in most cases banks domiciled in the stressed European countries.

When deciding how to adjust after an increase in risk weights, in order to comply with the Capital Requirements Regulation, banks will consider 1) whether they have sufficient capital buffers or can raise additional capital, 2) whether they can dispose of the affected sovereign exposure at a reasonable price, keeping in mind potential losses, and 3) whether they can find suitable substitutes to invest in, keeping in mind their yield and the effects on bank profitability. In addition, banks are also limited by the LCR regulatory ratio.

In case banks could not raise sufficient capital, they would need to adjust on the asset side, by disposing the affected sovereign exposure and either substituting it with other investment or reducing the total balance sheet size. The extent to which they would reduce exposure to the sovereigns with increased risk weight depends crucially on the losses they would incur by doing so. In the transition period, if given enough time to adjust, banks could decide to keep sovereign paper until maturity and limit participation in the primary market. On the other hand, an alternative scenario is possible, where banks try to sell the relevant sovereign exposures as soon as possible in order to minimise their losses. The shedding of sovereign exposures and the price effects would depend crucially on the amount of exposures in the Held-to-Maturity (HTM) portfolio, which is valued at book value, and price elasticity of the sovereign paper.^{25,26} In the steady state, sudden increases in risk weights on certain sovereigns would also have a potential to lead to such sell-offs.

Banks can match the resulting reduction in exposure to sovereigns with increased risk weights by:

- Investing in suitable alternatives and keeping the size of the balance sheet unchanged (see Figure 4, panel A). Banks will look for alternative investment options in order to keep their RWA constant. If the LCR regulation is binding, they will invest in HQLA, like deposits at the central bank and sovereign bonds with lower or zero risk weights.²⁷ In this case, lower yields on these assets will have a negative impact on banks' profitability. At the same time, due to the lower riskiness of the portfolio, banks' funding costs could decrease, to the extent this effect is not counteracted by higher costs of financing for the whole economy and increases in financing costs due to lower profitability. If instead the LCR requirement is not binding,

25 The purchases the ECB and NCBs are making in the framework of the Public Sector Purchase Programme of the ECB could counter the price effects of bond shedding to some extent.

26 Immediate selling of sovereign bonds is only possible from the trading book or from the Available-for-Sale (AFS) portfolio. HTM securities can be reclassified as AFS if the holder no longer intends (or is no longer able) to hold the debt to maturity. The carrying value is re-measured to the security's fair value, with any difference recognized in other comprehensive income. Reclassifying a HTM security may prevent the holder from classifying other debt securities as HTM, or even require other HTM debt to be reclassified as AFS. Reclassification of AFS instruments to HTM under certain conditions is also possible if a financial asset is no longer held for the purpose of selling. In this case, financial assets should be reclassified at its fair value on the date of date of reclassification.

27 In the transition period, if following the IRB approach, banks would move from zero to positive risk weights on the whole sovereign portfolio. Therefore, switching to other less risky sovereign paper would not eliminate the need for additional capital. Even the least risky sovereigns would still get attached a positive risk weight instead of zero. Note also that short-term government bills could get assigned lower risk weights than bonds with longer maturities from the same sovereign if the bank was following the IRB approach.

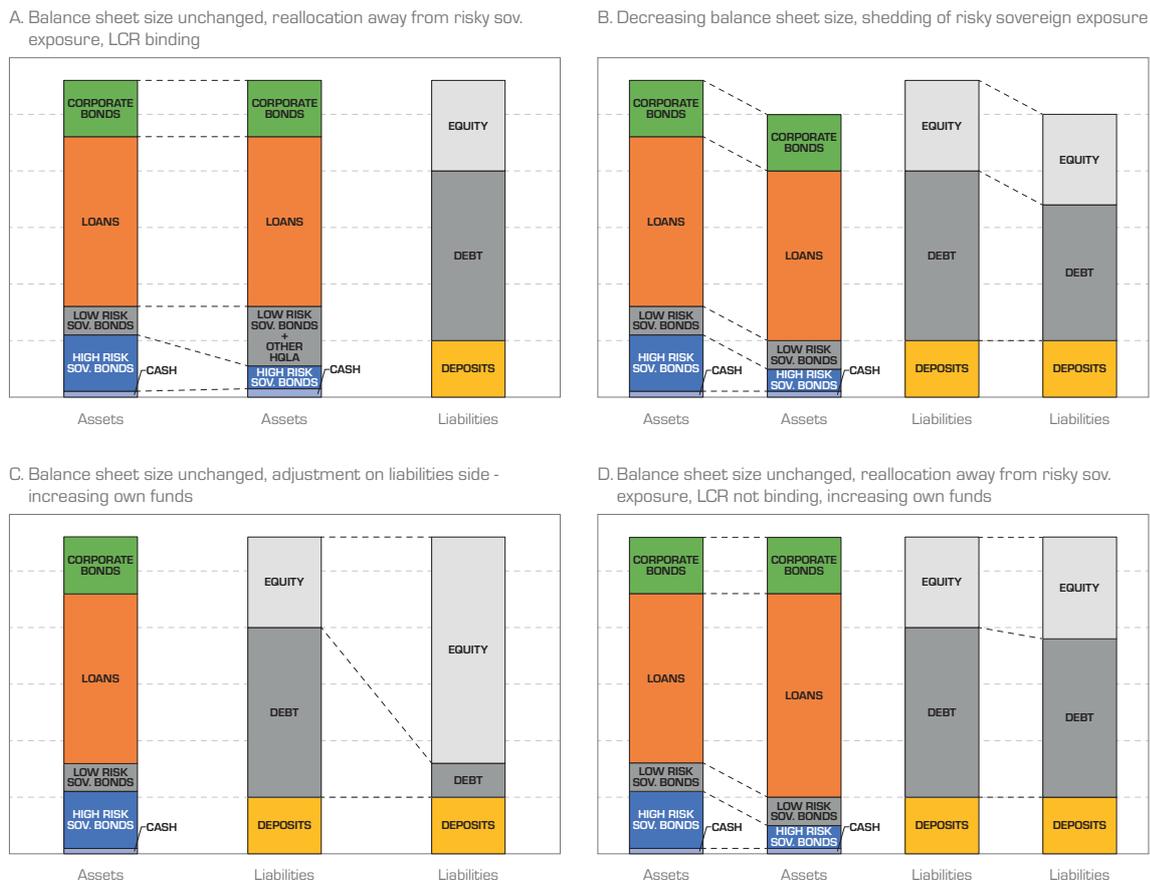
banks might also consider to invest in other asset classes with relatively high yields, like corporate bonds and loans, as long as these would imply a move back to the initial RWA.²⁸

- Alternatively, by decreasing debt on the liabilities side if no suitable investment options are available (see Figure 4, panel B). This would decrease the cost of funding due to the lower riskiness of assets and lower leverage, making the bank more resilient. Again, if positive risk weights increase the cost of financing for the whole economy or banks incurs losses, funding costs for the bank could nevertheless increase, depending on which factor prevails.

If banks are able to raise new capital, they could meet the CAR requirement in two ways:

- Banks could adjust only on the liabilities side, by reducing debt financing and increasing their own funds, keeping the balance sheet size unchanged (see Figure 4, panel C). The funding cost would increase.²⁹
- Alternatively, banks could swap affected sovereign holdings with corporate bonds and loans that carry risk weights between original and new risk weights of the relevant sovereign bonds. Also in this case the balance sheet size would remain unchanged but capital needs would still increase, due to higher RWA (see Figure 4, panel D).

Figure 4: Banks' balance sheet - portfolio readjustment



28 This could be foreseen only for cases where risk weights increase from an already relatively high level to an even higher one, thus only in the steady state.

29 We assume that the Modigliani-Miller theorem does not hold for the following reasons: i) taxes: since interest payments on debt are tax-deductible, banks have an incentive to operate with higher leverage and ii) explicit state guarantee: deposit insurance schemes reimburse losses not covered by banks' assets. As a result of these factors, banks' funding costs decline by increasing debt in the funding structure.

The first two options (or a combination of the two) are the more likely outcome, since they do not require recapitalisations which are costly and in certain cases hard to implement. This is particularly the case for banks in stressed countries. In the initial period, banks would probably adjust by substitution due to limitations on the liabilities side. In the longer run, however, we expect to see more banks decreasing their balance sheet size, as the alternative investments with zero risk-weights could have a negative effect on profitability. The amount of shedding would depend on the length of the transition period, the proportion of assets in the HTM portfolio and the price elasticity of the sovereign paper. According to the data provided under the EBA 2013 transparency exercise, only 20-30 percent of the banks' sovereign exposure was classified as HTM. Since a majority of the sovereign exposure can be sold immediately, frontloading risks are significant. The last two options (options C and D in Figure 4) are probable in banks that would not have problems with increasing their own funds via retained earnings, conditional on a sufficiently long transition period or those that have higher capital than the regulatory requirement.

The application of positive risk weights to sovereign exposures would almost certainly reduce leverage in the banking system, except if all banks adjusted according to the first option, which is unlikely. Lowering leverage per se reduces systemic risk as leverage typically magnifies the propagation of shocks across the financial sector and can render smaller shocks systemic.³⁰

Quantifying the effects of introducing positive sovereign risk weights in the transition period

Under the current regulatory setting, banks benefit from capital savings due to the application of de-facto zero risk weights for European sovereign exposures. Korte and Steffen (2015) estimate the size of this "sovereign subsidy" to amount to approximately € 750 billion as of June 2013 for a sample of 54 EBA banks.³¹ This exercise applies positive (IRB-style) risk weights to all non-domestic sovereign exposures of the sample banks and assumes that capital ratios and exposures are kept constant.

We analyse the potential transition effects of new regulation on the banking sector by using StA based risk weights in Table 1 for all the sovereign exposures, including domestic ones. We use the data of the EBA transparency exercise performed in 2013 which covers a sample of 54 banks. Sovereign exposure in this exercise is defined as the accounting value of sovereign exposures gross of provisions. Exposures cover only exposures (bonds and loans) to central, regional and local governments on an immediate borrower basis and do not include exposures to other counterparts with full or partial government guarantees. Figure 5 provides a picture of the distribution of banks' sovereign bond holdings by risk-weights attached. The "home bias" phenomenon described above is reflected in a very large share of domestic exposure in banks' holdings of sovereign bonds. The concentration is particularly high in stressed EA countries, such as Portugal, Spain and Greece, where 90 percent of banks' sovereign bond portfolio includes domestic government bonds.

³⁰ See Adrian and Shin (2010).

³¹ Their sample includes banks that were a part of EBA stress testing and AQR exercises over the period March 2010 to June 2013. The sample includes the largest banks in Europe, thus it usually makes up more than 90% of the exposures in all banks that formed part of the EBA exercises.

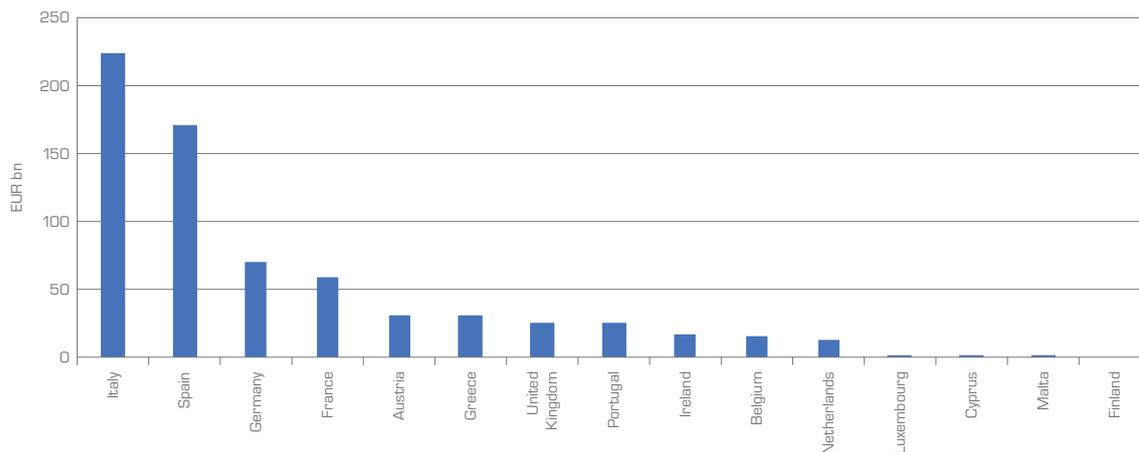
Figure 5: Distribution of EU banks' government exposures, by risk weights



Note: Figures are aggregate gross exposures across EU banks participating in the EBA's exercise 2013.
 Source: SnL

In nominal terms, Italian banks hold the largest sovereign exposure that would have positive risk weights, with more than € 200 billion in exposures, while Spanish banks follow closely with € 170 billion. The next two banking sectors, German and French have smaller exposures to sovereigns that would receive positive risk weights, with amounts of around € 60-70 billion (Figure 6).

Figure 6: Non-zero risk weighted sovereign exposure



Note: Figures are aggregate gross exposures across EU banks participating in the EBA's exercise 2013.
Source: SnL

In what follows, we simulated potential scenarios of the banks' adjustment to the new regulation during the transition period, assuming that there is no change in bond prices. Since risk weights would increase on most of the sovereign bond holdings during the transition, banks would need to decide how to adjust their portfolios. The adjustment options could be summarised in 4 scenarios:

- i) increasing capital without selling sovereign bonds,
- ii) selling bonds with risk-weights beyond 88%³² (Portuguese, Cypriot and Greek) and increasing capital to cover for other sovereign bonds with new non-zero risk-weights,
- iii) selling bonds with higher than 40% risk-weight (bonds mentioned above plus Italian, Spanish and Slovenian bonds) and increasing capital to cover for other risky sovereigns, or
- iv) selling all bonds with non-zero risk-weight (i.e. higher than 0%).³³

In the first scenario, banks would need to increase capital by some € 32 billion in order to maintain their current CET 1 ratio (Table 3).³⁴ In the fourth scenario, as the other extreme, banks would dispose of nearly € 700 billion of sovereign bonds from their portfolio. About 60 percent of this supply would originate from Spanish and Italian banks.

In our view, an intermediate scenario seems to be the most realistic. For example, in Scenario ii) banks simultaneously adjust the asset and liabilities side of the balance sheet. In our simulation, banks would dispose of their Portuguese, Cypriot and Greek bonds and increase capital by € 25 billion. This scenario would still result in bond portfolios being sold or reallocated in the amount of 10 percent of the outstanding government debt in the affected countries. Scenario iii) works along similar lines with a smaller amount of additional capital needed and with the banks having to shed a much bigger portion of their sovereign bond holdings.

32 88% is the risk weight assigned to Portugal in a StA setting under the assumptions in Table 1.

33 Note that scenario i) corresponds to option (3) in the previous section. In scenarios ii)-iv), sovereign exposures with newly non-zero risk weights could be either substituted with less risky assets (option 1) or the bank could decide to shed them and let the total balance sheet shrink (option 2). Alternatively, there could be a mixture of the two. Scenarios ii)-iii) would then correspond to a mix of options (1) and (2), combined also with capital increases (i.e. option (3)) to cover for the rest of the sovereign portfolio with newly increased risk weights. Scenario iv) would correspond to a mix of options (1) and (2), without the need to inject new capital.

34 This figure does not take into account that banks may have some capital buffers, which would accommodate part of the increase in the risk weights.

Table 3: Bond selling and capital need under different scenarios

Banks in (EUR mn)	Scenario i)		Scenario ii)		Scenario iii)		Scenario iv)	
	Bond selling	Capital increase	Bond selling [150% - 88%]	Capital increase	Bond selling [150% - 40%]	Capital increase	Bond selling [150% - 13%]	Capital increase
Germany	0.0	2,817.8	6,393.0	2,320,3	58,452.0	237.9	70,381.8	0.0
France	0.0	2,708.1	1,789.5	2,517,5	50,064.2	167.5	59,144.5	0.0
Italy	0.0	10,031.2	3,201.5	9,683,7	206,641.3	348.8	223,574.8	0.0
Spain	0.0	7,073.6	3,390.2	6,815,5	166,216.5	80.0	170,086.9	0.0
United Kingdom	0.0	1,227.6	1,791.7	1,036,1	21,272.4	99.4	25,075.6	0.0
Netherlands	0.0	513.1	1,010.1	401.0	6,001.3	145.1	12,297.9	0.0
Austria	0.0	1,112.8	2,994.1	780.0	10,184.5	377.7	30,823.9	0.0
Belgium	0.0	666.3	3,652.2	239.5	4,680.5	185.6	15,563.5	0.0
Greece	0.0	1,942.4	28,343.4	78.2	30,329.7	6.0	30,672.2	0.0
Portugal	0.0	2,619.9	21,991.4	129.8	23,294.6	48.4	24,880.6	0.0
Ireland	0.0	723.2	25.4	719.8	308.5	701.6	16,676.8	0.0
Luxembourg	0.0	106.0	207.6	77.9	1,370.5	1.9	1,434.0	0.0
Finland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malta	0.0	24.5	9.8	23.5	15.6	23.2	798.5	0.0
Total	0.0	31,566.5	74,799.7	24,822.9	578,831.7	2,423.2	681,411.1	0

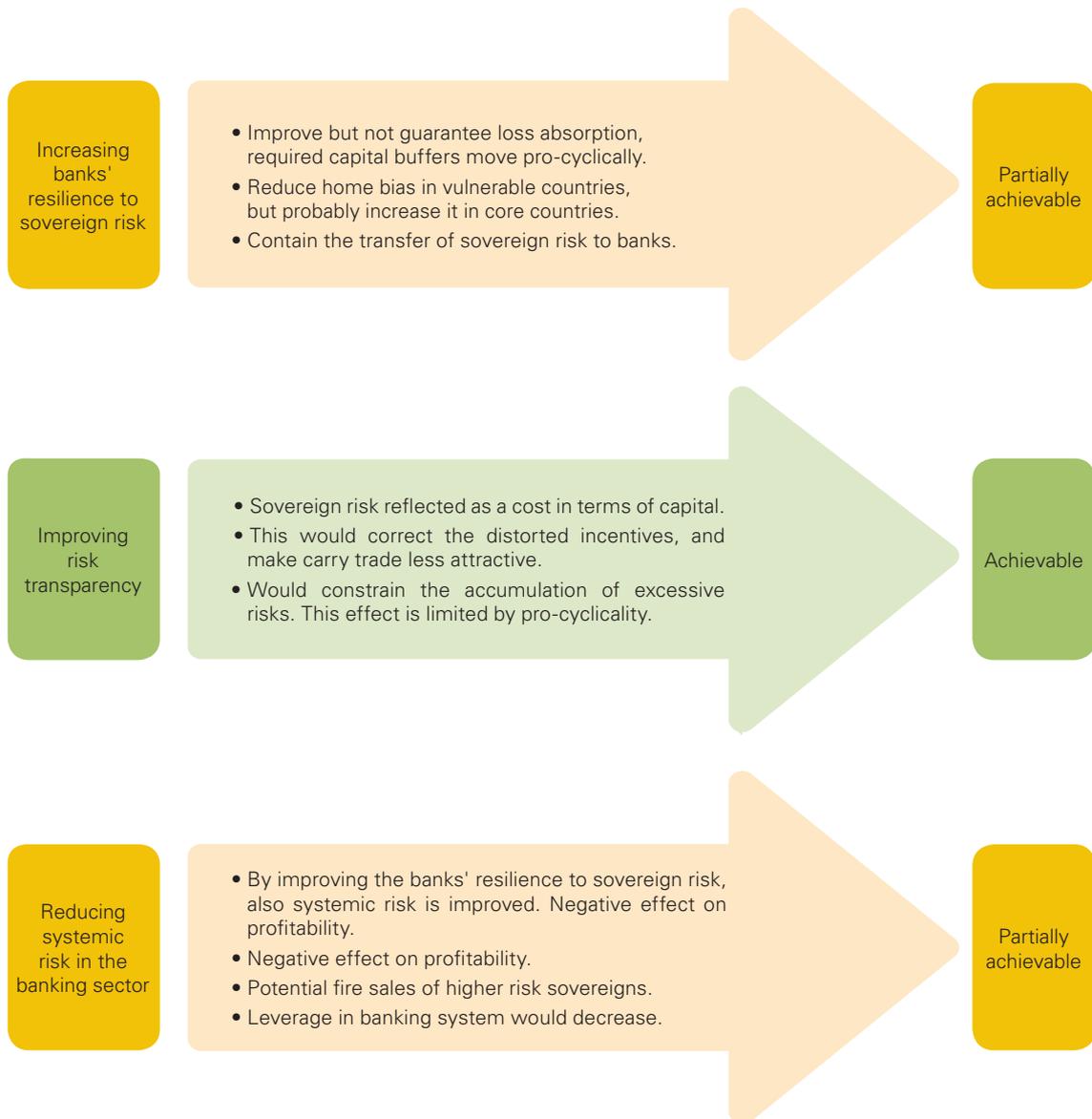
Note: Figures are aggregate gross exposures across EU banks participating in the EBA's exercise 2013.
Source: SnL

Note that once the new regulation is in place (i.e. after the transition period), the change in the riskiness of one sovereign and implied risk weights would lead to significantly smaller sell-offs and/or changes in required capital.

Fulfilment of objectives in the steady state

Figure 7 summarises to what extent the positive risk weights are able to fulfil the objectives set out in Chapter 3 in the steady state.

Figure 7: Objectives of the proposed regulatory changes and their fulfilment by introducing non-zero risk weights in the steady state



Impact on sovereign debt markets

The features that render sovereign bonds attractive to banks are diverse and hence, the impact of positive risk weights would go in several directions. The decision-making inside banks is complex and the primary effects might fall on the trading desks inside banks. Positive risk weights on sovereign exposures would mean higher costs of holding inventories (warehousing) for banks that are acting as primary dealers and market makers in the sovereign bond markets. While due to other regulatory changes, banks' participation in these activities has already dropped to a low point, this could strengthen the move of banks from a dealer to a brokerage model in which they – for cost reasons – no longer take principal risk and commit their balance sheets. The withdrawal of banks from dealing would have important liquidity effects on these markets and could

increase sovereign borrowing costs due to a higher liquidity premium. While one can argue that the current low level of the liquidity premium is due to the favourable treatment of sovereign exposures,³⁵ moving to an equilibrium without such a bias would still require careful calibration. A reduction in market-making activities would also lead to higher volatility in the sovereign bond markets, which can further decrease liquidity.

However, there are other desks that hold sovereign bonds. Asset – liability management would mostly be interested in the liquidity features of sovereign bonds and base their demand on regulatory requirements and the need for collateral. Other parts of the bank, like the syndication desk or investment banking would again be driven by different motivations. In sum, it is difficult to predict the overall impact of a regulatory change on banks' engagement in sovereign debt markets. It seems, however, plausible to assume that banks would start rebalancing their portfolio by reducing their exposure to sovereigns with higher risk weights. The supply of those bonds would increase with an unmatched demand, leading to higher prices and a potentially less liquid market. The speed of adjustment would depend on the proportion of the sovereign bond portfolio marked-to-market and the transitional arrangements.

Introducing positive risk weights would also likely have an impact on the yield curve, although the potential effects are ambiguous and the final outcome is not known. To the extent that internal risk models are used, government exposures with shorter maturities would be assigned a lower risk weight under the new regulation. This could mean that banks would try to move to shorter maturities and cause a steepening of the yield curve. On the other hand, as regulation would generally increase costs, banks could try to match the higher cost with a higher return by moving up the maturity spectrum. This would flatten the yield curve and increase the maturity mismatch on banks' balance sheets.

Impact on sovereigns

Given the possible adjustment options for the banks following an increase in risk weights discussed in the previous chapter, there are a number of ways in which the new regulation imposing non-zero risk weights would affect the sovereigns both in transition period and in the steady state, after the introduction of new regulation.

First, a reduction of exposures to stressed sovereigns and a lower demand for their paper on the primary market can have significant effects on sovereign bond prices and yields. While proper risk-weighting would remove distortion in the bond prices, it can have potentially very damaging effects for vulnerable sovereigns, as it leads to increased funding costs and more difficult market access. In addition, non-zero risk weights would lead to reduced liquidity on the affected sovereign bond market, which would increase the financing costs of the vulnerable country via an increase in the liquidity premium. At the same time, the demand for less risky sovereign bonds would increase as banks would rebalance their balance sheets, lowering their yield. Both developments together would lead to a divergence in sovereign bond prices across the EU. These developments can also arise in the steady state, since exposures to a particular sovereign would vary with the risk weights. Regulation based on pro-cyclical CRA ratings could thus fuel the vicious circle of increases in risk weights due to downgrades, reduction of sovereign exposures and increases in required yield, triggering further downgrades. Similarly, the feedback loop would also be present for IRB based risk weights. Note that the upward pressures on sovereign yields could be aggravated if the regulation was changed solely at the EU/EA level, since it would lead to a comparative disadvantage of stressed EU/EA member states in terms of funding conditions vis-a-vis the (potentially equally risky) issuers in the rest of the world.

35 This is the so-called "liquidity illusion". See CGFS (2015).

Second, since sovereign bonds serve as a benchmark for other fixed income assets, an increase in their yields leads to a higher cost of financing for the whole economy. Following an increase in sovereign risk, we would thus see firms in stressed countries facing higher financing costs, leading to a negative impact on economic recovery. Similarly, banks' cost of funding could increase, counteracting a potential decrease in this cost stemming from a reduction in the riskiness of banks portfolios. This effect is present in the transition phase and in the steady state.

Third, in the steady state, we could see some positive effects of non-zero sovereign risk weights, as the cost of holding sovereign bonds in terms of capital would increase vis-à-vis the cost of loans to the private sector. Banks would thus potentially (if the liquidity requirements are not binding) replace part of the stressed sovereign exposure with lending to the private sector. The size of this effect is uncertain, and would be limited by the demand for loans.

Finally, higher capital needs due to higher RWA can result in the need for sovereign participation in cases when the banks are state-owned. Due to the presence of home bias in sovereign bond holdings, this channel becomes especially problematic in stressed countries, potentially leading to funding problems of these sovereigns. These considerations are valid both in the transition to the new regulatory regime and in the steady state.

Pro-cyclicality of risk weights

Since risk parameters vary with the cycle, risk weights would move pro-cyclically, irrespective of whether the banks apply the StA or the IRB approach.³⁶ For the StA – which relies on CRA ratings – the pro-cyclicality materialises in the movement of agency ratings with the cycle. Additionally, the changes in ratings can sometimes be abrupt, which may lead to cliff effects. In contrast, the IRB approach does not cause cliff effects.

As a result, risk assessments may be excessively lenient when the economy is in an upturn, whereas, during broad-based price declines, views on risk may be too pessimistic. In the up-cycle too little capital is held, while banks may be desperately seeking more capital in a downturn.

This is a general feature (and problem) of risk weighting exposures of banks and has led to insufficient capital buffers in a number of banks during the financial crisis. In recognition of this, Basel III has introduced the leverage ratio which is independent of the risk of an exposure. The leverage ratio will complement risk-related capital holdings by effectively introducing a floor on capital holdings at the aggregate balance sheet level of the bank.

Risk weights are also pro-cyclical from a macroeconomic perspective. They normally increase during recessions, when the state of public finances deteriorates due to the workings of automatic stabilizers and increased use of fiscal stimulus. Thus, at a time when sovereign fiscal space is already squeezed, financing costs for the sovereign would further increase due to changes in banks' willingness to hold the bonds of that sovereign.

³⁶ See for example Adrian and Shin (2011) and Shin (2011).

This is true for sovereigns that do not have sound fiscal accounts. In this spirit and as a countermeasure to excessive pro-cyclicality, Gros (2013) proposes linking risk weights to the public debt or deficit figures and their compliance with the Maastricht rules, or to the Excessive Deficit Procedure. For instance, risk weight could remain at zero if both debt and the deficit as a percentage of GDP remain below 60% and 3% respectively, and increase if the deficit or debt are higher than these limits for a number of years.³⁷

This approach would according to Gros (2015) lead to less pro-cyclicality than the CRA based weights, as the deficit and debt change only slowly over time. This proposal fails to remove pro-cyclicality in macroeconomic terms but leads to more objective risk weights and avoids the cliff effect. It also penalises exceeding the stability criteria of the Stability and Growth Pact (SGP), thus motivating a more conservative fiscal policy.

In order to mitigate pro-cyclicality in the up-cycle, the ESRB (2015) suggested introducing a floor on risk weights for sovereign exposures. This floor would assign a fixed positive risk weight to any sovereign exposure irrespective of its credit risk, to be applied in both in the StA and IRB approaches.³⁸ It would avoid pro-cyclicality in the upturn of the cycle and would decrease the amount of capital shortfall in a downturn.

Risk weights would ideally be constructed in a countercyclical way, in analogy to the idea of countercyclical capital buffers. Higher risk weights in the boom could prevent the build-up of excess sovereign debt holdings and increase the capital buffer that could be consumed when a crisis hits. During the crisis, the risk weights would decrease to accommodate the need for larger fiscal space. The risk weight floor, listed as one of the options in ESRB (2015) goes only half the way, since it mitigates pro-cyclicality but does not have countercyclical elements. At the same time, it avoids the difficulty of identifying the current and future state of the cycle in advance and mapping different states of the cycle to specific risk weights.

A recent note by the European Political Strategy Centre notes that large exposure limits (as discussed in the next section) are preferable over positive risk weights, precisely because they are not pro-cyclical.³⁹

Fulfilment of desired outcomes in the steady state

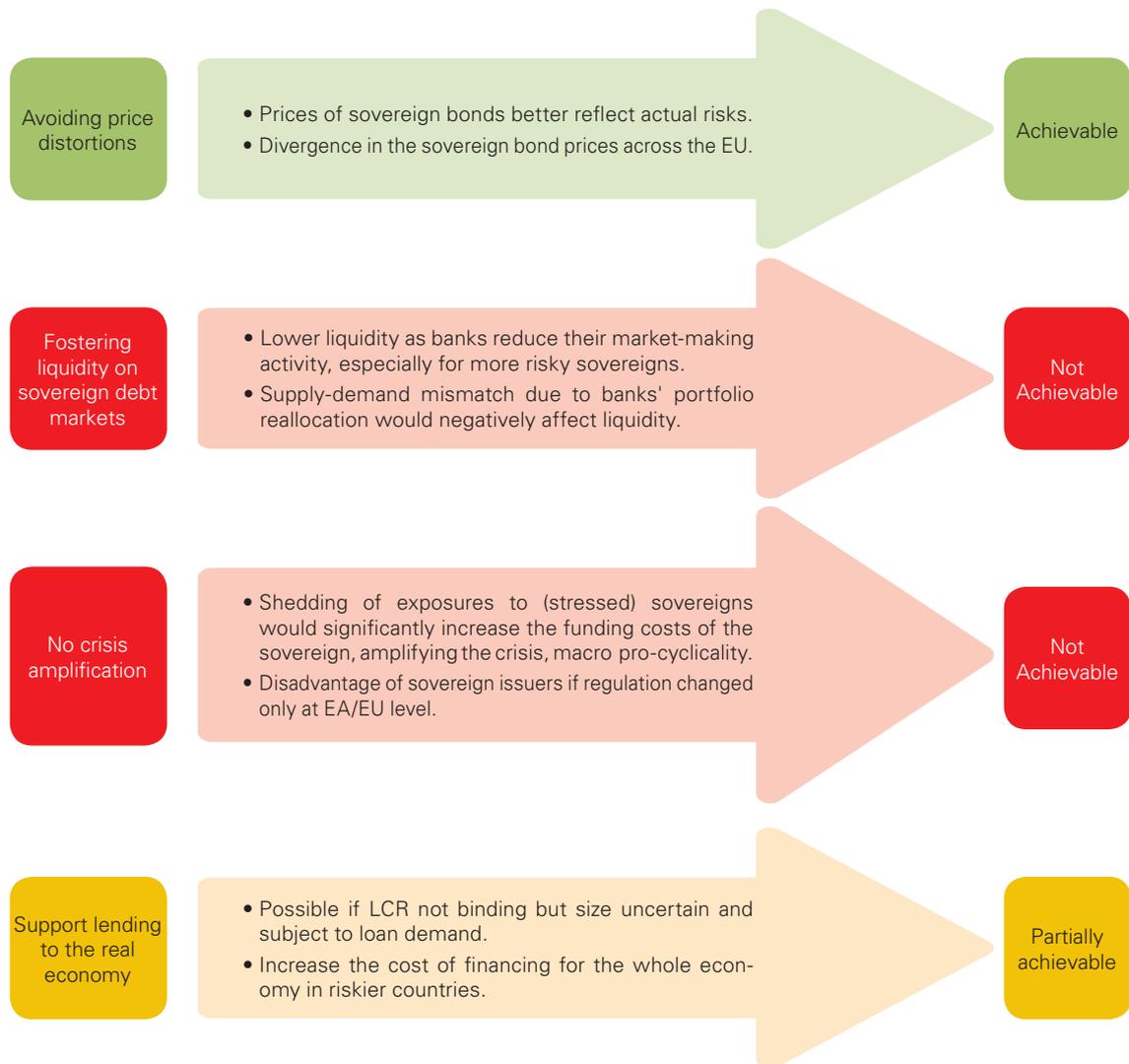
Figure 8 summarizes the effects of positive risk weights on the sovereign financing conditions and economy in the steady state.

37 Gros (2013) suggests to add 30% to the risk weight for every percentage point of deficit (in relation to GDP) in excess of the Maastricht target. Alternatively, the author suggests to add to the risk weight the number of percentage points, by which the country is exceeding the Maastricht 60% debt-to-GDP target.

38 See ESRB (2015).

39 See "Further Risk Reduction in the Banking Union" Five Presidents' Report Series, Issue 03/2015, 9 November 2015.

Figure 8: Desired outcomes and their fulfilment by introducing non-zero risk weights in the steady state



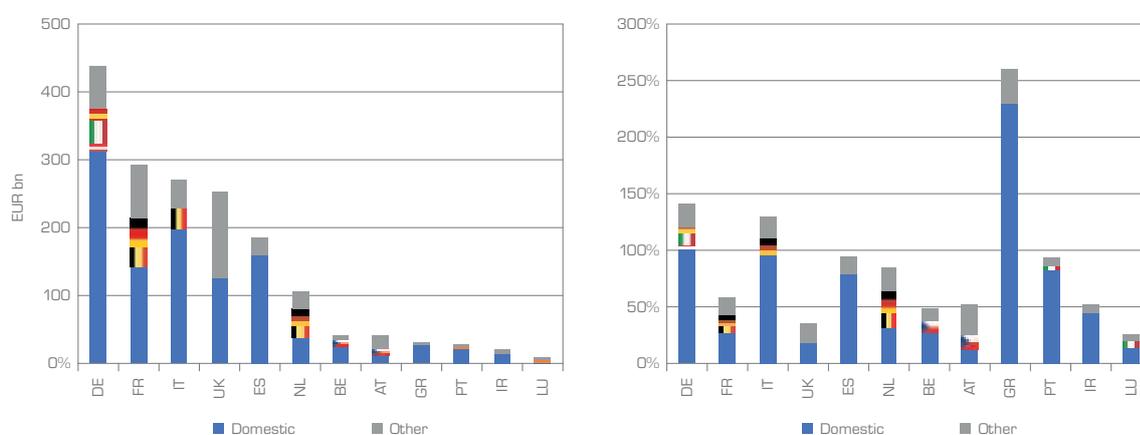
5. Introducing sovereign exposure limits

Although limits on sovereign exposure and positive risk weights both have the same objective, namely to minimise the feedback loop between sovereigns and banks and increase the banks' resilience to sovereign risk, they are different in many aspects. First, the sovereign exposure limit is a diversification tool that aims to reduce the risk in bank balance sheets by limiting the exposure to any single counterparty. Second, it does not intend to incorporate the real risk of the sovereign by requiring more capital for the riskier sovereign exposures. It ignores credit risk per se and seeks risk reduction via diversification. Lastly, it is less pro-cyclical. At a system level (i.e. in the euro area) banks will be forced to hold a diversified government bond portfolio, but that does not preclude them from absorbing additional sovereign bonds from other issuers. However, in a situation of stress, if the domestic banking sector could no longer absorb the additional supply of government bonds and banks from other jurisdictions and other sectors were unwilling to do so, exposure limits could result in cliff effects and put further pressure on the funding conditions of the sovereign that is already under stress. Furthermore, due to internal capital generation in the upward phase of the cycle and losses in the downturns, bank equity and as a consequence, the nominal limit changes in a pro-cyclical manner. In the transition, government debt agencies would be required to build a geographically more diversified investor base, which could prove challenging. This could be particularly difficult for smaller countries with less liquid sovereign bond markets.

Impact on banks

As mentioned before, current regulation limits exposures to any counterparty to 25 percent of own funds. Based on the same dataset as above, EU banks have almost € 2,000 billion exposure to different sovereigns.⁴⁰ German bank portfolios are most concentrated, with more than €300 billion in domestic government bonds. Their exposure to Austria, Italy and Spain also exceeds 25 percent of their capital (Figure 9). The home bias is also strong in Italy and Spain, while less pronounced in the UK and France. Banks with an extended international subsidiary network typically have large exposures to the subsidiaries' sovereigns.

Figure 9: Sovereign exposures of EU Banks in nominal terms (left panel) and in % of own funds (right panel)



Note: Figures are aggregate gross exposures across EU banks participating in the EBA's exercise 2013. National flags represent large exposure to that specific country.
Source: SnL

40 We used the EBA 2013 transparency exercise dataset. Sovereign exposure in this exercise is defined as the accounting value of sovereign exposures gross of provisions. Exposures cover only exposures (bonds and loans) to central, regional and local governments on an immediate borrower basis and do not include exposures to other counterparties with full or partial government guarantees.

Adjustments in bank balance sheets – transition to the steady state

Banks' adjustments strategy are similar to those discussed in the capital charge option above. If exposure limits are introduced and restrict banks' desired holdings of sovereign paper, they can choose between keeping their total assets unchanged and substituting some of their sovereign holdings or adapt their balance sheet size. Their choice how to adjust to the new regulation would be driven by two factors: whether there were sufficient close substitutes on the market, and, if not, how they would rearrange their portfolios.

If there were sufficient close substitutes on the market, banks could substitute their domestic government bond portfolios with similar assets:

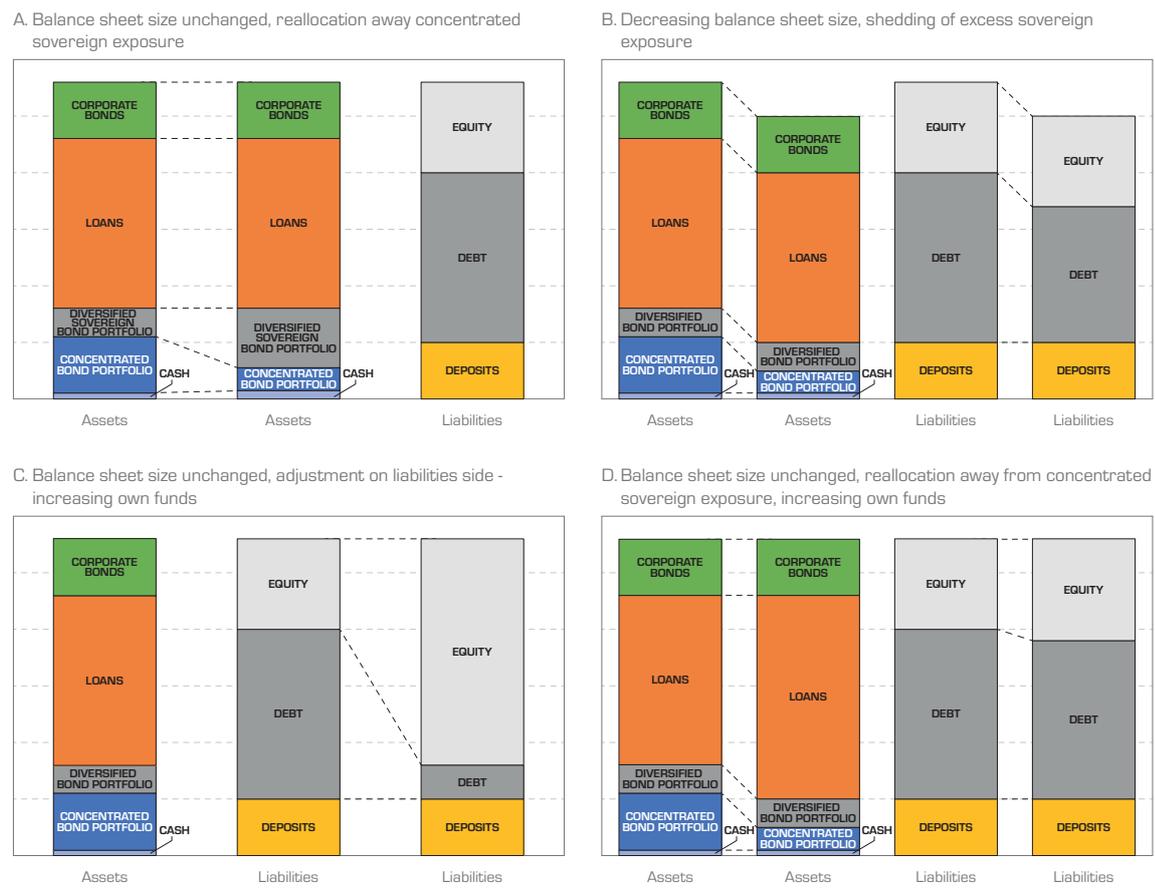
- They could switch to other sovereign/supranational bonds with a similar risk level and same risk weights (Figure 10, panel A).
- They could also substitute the sovereign bonds that they have to shed with a deposit at the central bank that carries a zero risk-weight. Although this instrument is not a perfect substitute for government bonds, it is easily accessible and similarly liquid according to LCR standards. However, such adjustment could reduce profitability.

In case liquidity regulation is binding, the substitutes should not only be similarly risky and liquid, but should also qualify as HQLA. However, most instruments on the markets with similar liquidity and risk-return characteristics as government bonds, qualify as HQLA.

If banks do not find instruments to substitute their government bond portfolio, they need to adapt their balance sheet by decreasing leverage.

- If they decided to decrease their activity, they could diversify by disposing of their excess sovereign bonds and reduce their outstanding debt simultaneously (Figure 10, panel B).
- If they chose to maintain their size and are able to get new capital, they can either adjust on the liabilities side and match an increase in their own funds with a decrease in debt, or reshuffle their portfolio and invest in other asset classes, such as loans, other sovereign bonds or corporate bonds. (Figure 10, Panel C and D).

Figure 10: Banks' balance sheet - portfolio readjustment



In our view, the banks' response could depend on the available time to adjust, the size of the mark-to-market portfolio and the possibility to invest in other sovereigns with a similar risk-profile. Given that a significant part of banks' sovereign exposures is ready to be sold immediately and banks tend to frontload regulatory changes, a large part of sovereign bond portfolio could be shed early in the transition period. In the short run, banks' funding structure could limit the ability to adjust by shrinking the balance sheet size. In this case, banks would substitute their sovereign exposure with other instruments that have a similar risk profile, if possible, or increase their investments in central bank facilities.⁴¹ After an initial adjustment phase, we expect also some adjustment via deleveraging.

Quantifying the effects of introducing limits on sovereign exposures in the transition period

Assuming that the standard large exposure limit of 25 percent of total capital would be applicable to sovereign bond exposures without considering any transition arrangements, the rebalancing need would be around € 820 billion at the aggregate EU level. On average, this represents 8 percent of the outstanding government debt market. In nominal terms, the highest need for portfolio reallocation would arise in Germany, where banks would need to accommodate the disposal of nearly € 270 billion of government bonds (Table 4).

⁴¹ For more details on reliance on central bank facilities after the introduction of regulatory changes, see CGFS (2015).

Since both the size of the sovereign bond market and the concentration of domestic sovereign bonds in banks' balance sheets differ from country to country, the supply of government bonds and the demand for other sovereign bonds will not necessarily offset each other. In order to demonstrate this, we simulated such a regulatory change with the following assumptions:

- First, banks will look for perfect/close substitutes. We consider a government bond perfect or close substitute if it has the same risk-weights in EBA's suggested framework.⁴² Based on this assumption, we differentiate 4 country groups.⁴³ Non-euro area government bonds are considered to be close, but not perfect substitute mostly because these instruments hold currency risk.
- Sovereign bond markets are sufficiently liquid, transactions can be settled without substantial delays and at low cost.
- Once they exhaust their diversification possibilities within the groups, banks will start looking for other alternatives.
- Sovereign exposures remain with zero-risk weights and bond prices remain unchanged.
- FX swap markets function smoothly, i.e. currency risk can be hedged easily.

Table 4: Rebalancing needs in EU banks

Banks in the country	Average Rating	Total allowed (EUR bn)	Rebalancing need (EUR bn)*	Total Government Bond Holding as a % of Own Funds	General Government Gross Debt (EUR bn)	Rebalancing need as a % of General Government Gross Debt	Excess demand from banks
Germany	AAA	77.57	273.41	140.65%	2,179.81	12.54%	236.16
Netherlands	AAA	31.43	34.04	84.15%	426.15	7.99%	
Luxembourg	AAA	4.27	1.91	25.54%	9.61	19.87%	
UK	AA+	176.37	45.33	35.85%	1,740.78	2.60%	
Austria	AA+	20.53	14.33	51.35%	258.53	5.54%	
France	AA	126.89	88.43	57.85%	1,869.16	4.73%	
Belgium	AA	21.66	24.71	48.82%	403.17	6.13%	
Ireland	A	9.32	10.18	52.90%	210.24	4.84%	
Malta	A-	0.28	0.62	72.30%	4.87	12.66%	
Italy	BBB	51.62	177.32	130.08%	1,988.90	8.92%	53.07
Spain	BBB	50.10	121.89	93.13%	890.98	13.68%	
Portugal	BB+	6.73	17.10	93.54%	211.78	8.08%	
Greece	CCC	3.03	10.61	259.76%	304.71	3.48%	
Sum		579.80	819.88	79.22%	10,498.69	7.81%	289.23

Note: Total Government Bonds Holding as a share of own funds hides the fact that in some cases, there is no rebalancing need at the aggregate level, however, certain banks in a given country need to reduce their domestic sovereign bond holdings.

Source: SnL, EBA transparency exercise 2013

42 For more details, see <https://www.eba.europa.eu/documents/10180/877382/JC-CP-2014-01add+%28Addendum+to+Joint+CP+on+draft+ITS+on+the+mapping+of+ECAIs%29%20-for+publication.pdf>.

43 Group 1 consists of Germany, Luxembourg, Netherlands, UK, Austria, France and Belgium, Group 2 contains Ireland and Malta, Italy and Spain form Group 3, while Portugal and Greece are the single countries in Group 4 and Group 5, respectively.

According to our simulation, banks in smaller countries with the best ratings (between AAA and A-) could nearly satisfy their needs within their groups. The Greek and Portuguese banks would need to swap their domestic sovereign bonds to higher rated ones (to Portuguese and German, respectively). However, German and Italian banks would not be able to find enough sovereign government bonds to substitute their current large exposures. As a result, banks would be left with roughly € 290 billion sovereign bonds still to be shed (Table 4). It is important to note, however, that banking groups could exploit synergies with their subsidiaries, hence the overall effect could be more restrained.

If banks decided to increase capital and keep their large exposures to sovereign bonds, additional capital of € 1,200 billion would be needed. They can also reduce their debt, by either maintaining total assets at the initial level or by decreasing the asset side as well. Table 5 summarises the effects of different scenarios. It is important to note, however, that should other euro area banks decide to take over the excess government bonds from German and Italian banks on top of their own diversification needs, lending could decrease in the euro area as a whole.

Table 5: Possible effects on banks' capital, lending and debt under different assumptions

Scenario	Possible effect on:			
	Domestic government bond portfolio	Capital	Lending	Debt
i) Decreasing debt (Figure 10, panel B)	- € 300 bn	€ 0 bn	€ 0 bn	- € 300 bn
ii) Reshuffling the liability side – increasing capital (Figure 10, panel C)	€ 0 bn	€ 1,200 bn	€ 0 bn	- € 1200 bn
iii) Reshuffling the asset side - increase in lending (Figure 10, panel D)	-€ 300 bn	€ 150 bn	€ 300 bn	- € 150 bn
Sum	- € 300 – 0 bn	€ 0 – 1,200 bn	€ 0 – 300 bn	- € 1200 – - € 150 bn

Source: ESM staff calculations based on EBA transparency exercise 2013

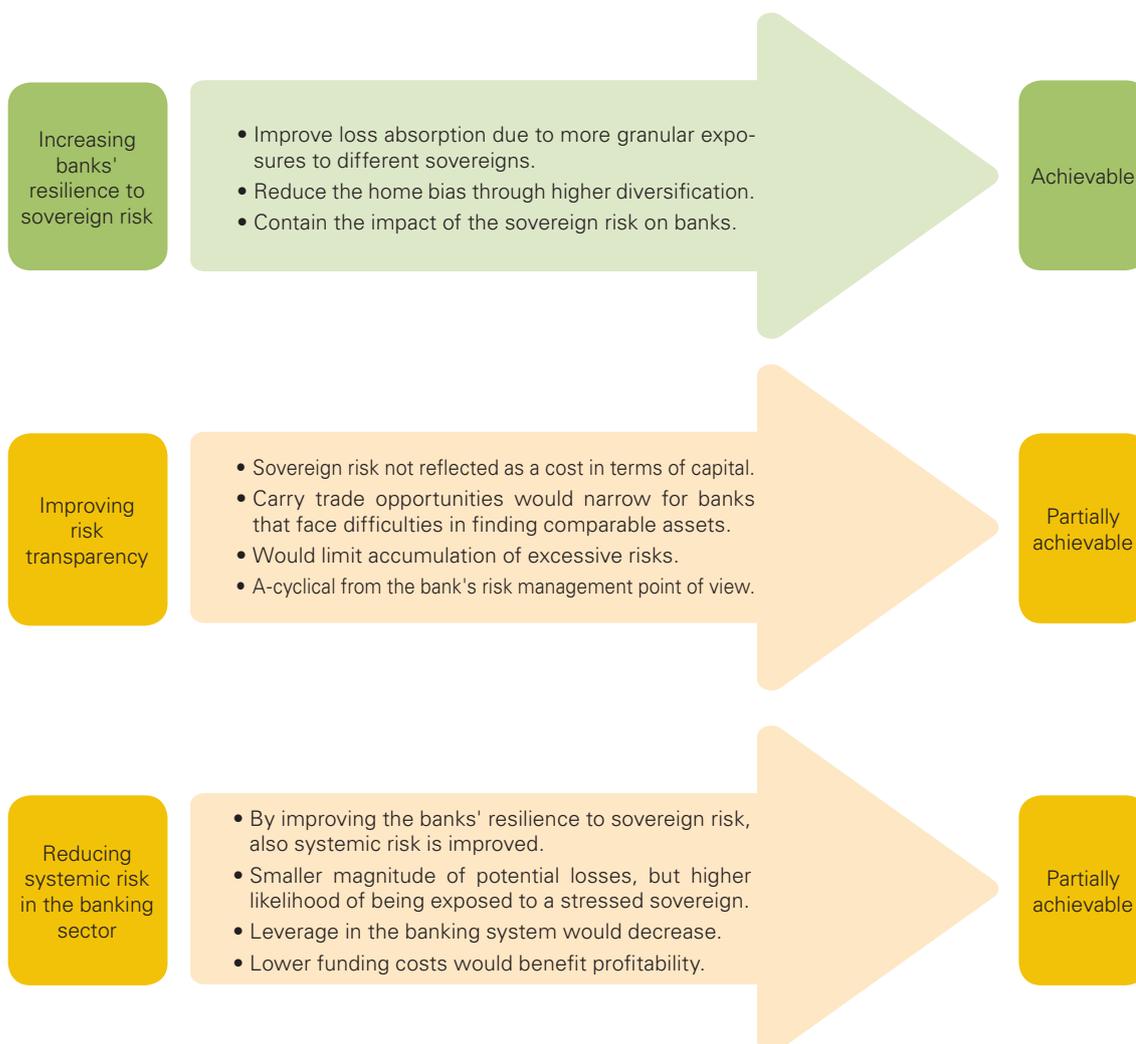
In the short-term, the new regulation would most likely be neutral for banks in countries with mid-range ratings, since their profitability would not change considerably. However, it would be clearly negative for banks in countries with large amounts of outstanding government debt (in nominal terms) since some of them would not be able to substitute their excess government bond holdings. Whatever these banks' adaptation choice will be, their average funding costs will increase during the transition phase since their funding structure becomes more tilted toward equity (decrease in leverage) or their business model becomes more risky.

Fulfilment of objectives in the steady state

In the steady state, the banks' less risky (more diversified) profile would probably result in lower funding costs, which would strengthen the banking system as a whole. This could contribute to the recovery of lending to the private sector. Overall, such a regulatory change would result in higher geographic diversification of sovereign debt but would not result in any winner on the individual bank level. Moreover, imposing limits on sovereign bond exposure is an appropriate tool to remove the distortions incentivising the home bias and to mitigate risks stemming from highly concentrated bond portfolios but it is unable to make the actual risk of sovereigns reflected in the cost of capital.

In Section 2 we set out the expected objectives of the new regulatory proposals. Figure 11 summarises these goals and evaluates whether the limits on sovereign exposures would help reaching them.

Figure 11: Objectives of the proposed regulatory changes and their fulfilment by introducing sovereign exposure limits in the steady state



Impact on sovereign debt markets

Similar to the non-zero risk weight option, the new regulation could give negative incentives for banks to act as primary dealers and market-makers and could thus reduce market liquidity and increase the liquidity premium of government bonds. However, the impact of the exposure limit on sovereign debt markets could be eased if new actors entered into the primary market. Pension funds, insurance companies as well as other non-bank financial intermediaries (the shadow banking sector) could take over this role from the banking sector. This, however, could be problematic from two aspects. First, finding a new investor base could prove to be challenging for the sovereigns. Second, new investors entering the primary market would change market parameters, as these entities have different investment strategies. For example, increasing the participation of the shadow banking sector would most likely result in higher volatility, which to some extent could be offset by long-term investors, such as pension funds and insurance companies. Market liquidity would also be damaged if the excess sovereign bond supply is taken over by the private sector (such as households and corporates), as these actors tend to hold their government portfolio until maturity. On the contrary, increasing participation of foreign investors could have the opposite effect, but it could also lead to higher volatility. The overall impact on sovereign bond markets would thus depend on the composition of new entrants and the dominant investment strategy.

Impact on sovereigns

Similar to the consequences of the non-zero risk weights, limits on sovereign exposures could have multiple impacts on the sovereign in the transition period, depending on the adjustment of the banking sector. First, the effect of regulation would be very different for countries that have peers in terms of rating and size of their government bond markets, compared to those that have larger outstanding sovereign debt in absolute terms. Imposing limits on sovereign bond exposures would mean that banks need to further diversify their bond portfolios. Substituting the excess government bonds with similar assets would be particularly difficult for banks in countries with large absolute outstanding government debt (e.g. Germany and Italy) simply because other EU banks cannot fully absorb the excess supply of government bonds. As a result, these countries could face difficulties in finding new investors for their government bond portfolio. Our simulation exercise shows that due to the EU banks' limited absorption capacity, there would be an excess supply of more than € 200 billion of German bonds, which corresponds to 10 percent of the outstanding German government debt (Table 6). This could lead to decreasing bond prices and increasing yields, however, given German bonds' safe-haven status, it might not materialise in this particular case. Generally, the new regulation could lead to a price convergence between countries with high outstanding debt and those that have relatively smaller government bond markets (in absolute terms).

Table 6: Effect of sovereign exposure limit on the sovereign bond markets

Country	General Government Gross Debt (EUR bn)	Rebalancing need as a % of General Government Gross Debt	Excess supply in bond markets (EUR bn)	Remaining bonds in the market
Germany	2,179.81	12.54%	224.16	10.28%
Netherlands	426.15	7.99%		
Luxembourg	9.61	19.87%		
UK	1,740.78	2.60%		
Austria	258.53	5.54%		
France	1,869.16	4.73%		
Belgium	403.17	6.13%		
Ireland	210.24	4.84%		
Malta	4.87	12.66%		
Italy	1,988.90	8.92%	34.19	1.72%
Spain	890.98	13.68%		
Portugal	211.78	8.08%	6.39	3.02%
Greece	304.71	3.48%	10.61	3.48%
Sum	10,498.69	7.81%	275.35	2.62%

Note: Excess demand from banks in Table 6 is not equal to the excess supply of bonds since EA banks also have large exposures to non-EA countries that were not included in the EBA exercise, hence they were not part of the simulation.

Source: SnL, EBA transparency exercise 2013

Second, the limited ability for diversification requires adjustment on the liability side, i.e. increasing the proportion of equity in the funding structure. Depending on the magnitude, this could create a burden for sovereigns in the case of state-owned banks.

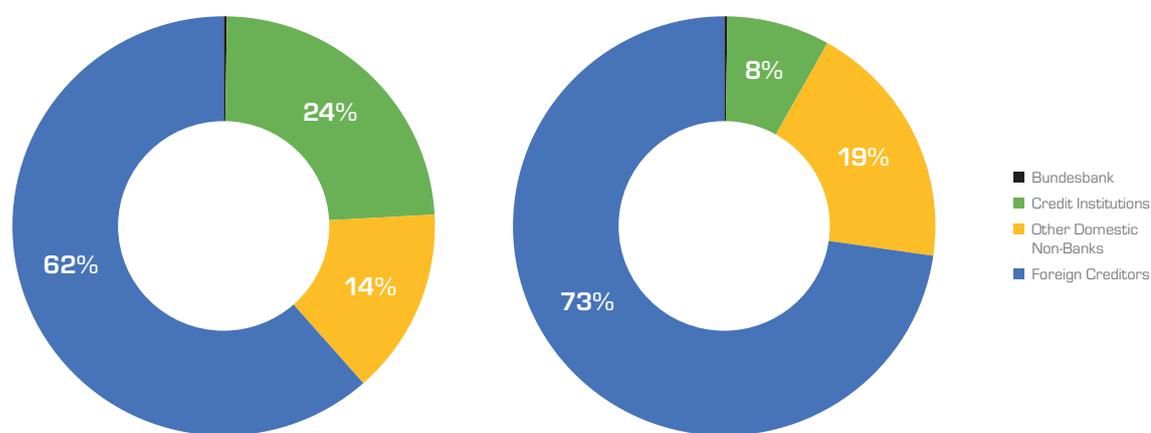
In the steady state, the banking system's ability to hold government bonds becomes limited, hence its excess government bond portfolio has to be taken over by other sectors. They could be either i) the domestic private sector (households or corporates); ii) foreign investors; and in longer-run, sovereigns could eventually decrease their outstanding debt. In the first two cases

(both in short- and long-run), the level of crowding-out (private investments already crowded out by borrowing of the government) would not change, since only the ownership of the outstanding debt changes. In the last case, however, it would decline as governments reduce their budget deficits and release private savings. This argument, however, only holds when there is no price fragmentation within the investor base. Arslanalp et al. (2014) showed that prices could indeed be different depending on the investor, which could have an effect on bank balance sheets and income statements once they are forced to sell these assets. More specifically, it is very likely that households or corporates do not attach any value to a government bond related to its eligibility for central bank operations. This would be reflected in the purchase price, resulting in a loss for the bank and an increase in the bond yield. Higher government bond yields lead to higher lending rates, which ultimately results in an increasing crowding-out effect.

Furthermore, more debt held by foreign investors could increase the country’s vulnerability. Foreign investors monitor closely whether a country’s foreign debt is sustainable. If global concerns arise and there are uncertainties about the short-term sustainability of a country’s foreign debt,⁴⁴ it could lead to fire sales of domestic assets. This would result in increasing yields, decreasing prices, and also increasing roll-over risks.

Based on our simulation, it seems that in Germany 80 percent of banks’ excess sovereign bonds should be taken over by other sectors. If other sectors take over the same proportion of the excess supply as their current share, debt held by foreign investors would increase to 73 percent from 62 percent, while debt held by the domestic private sector would change from 14 percent to 19 percent (Figure 12).

Figure 12: Holders of German government debt in end-2012 (left-hand panel) and after rebalancing banks’ government bond portfolio (right-hand panel)



Source: Bundesbank, ESM staff calculations

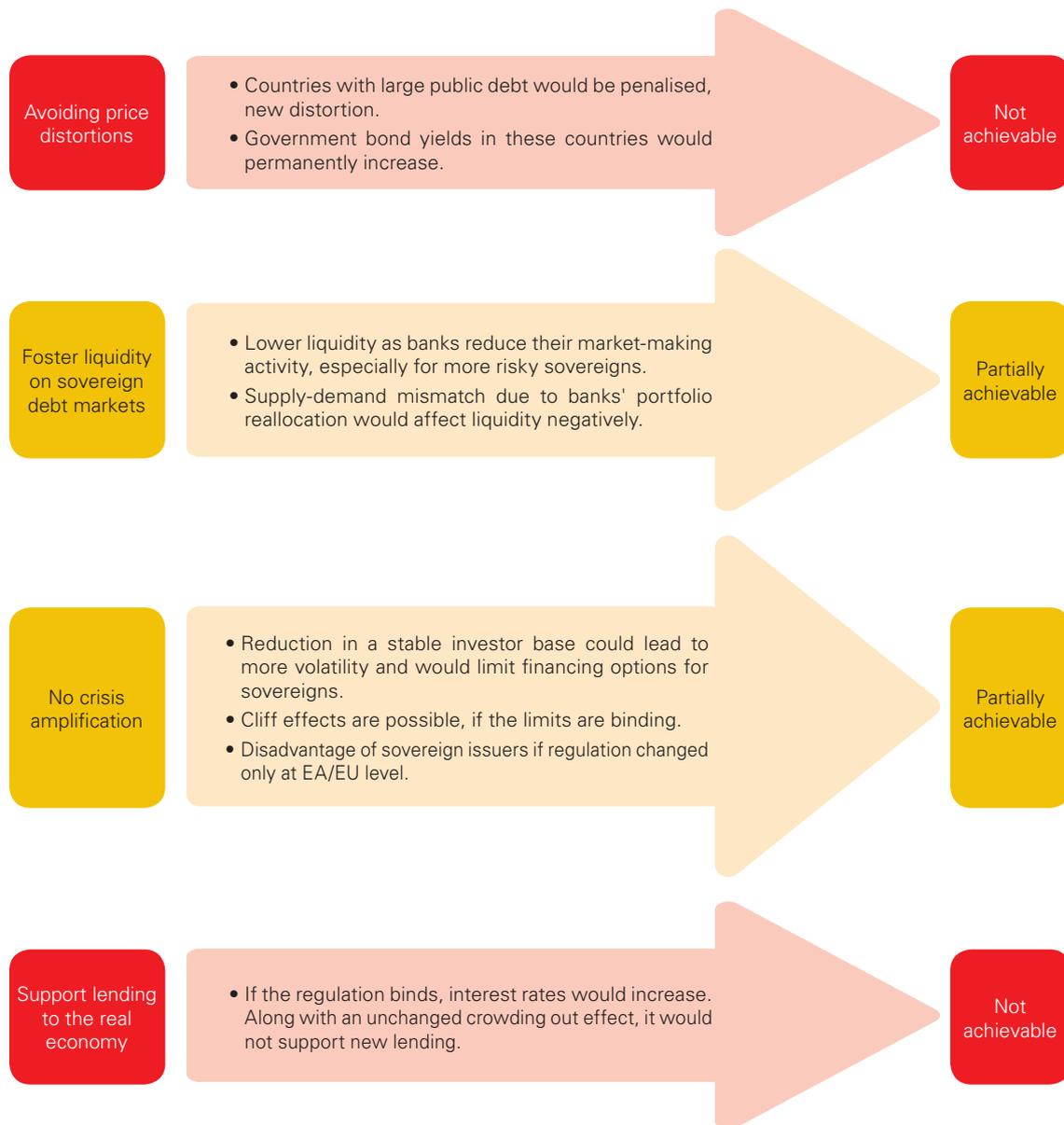
Fulfilment of desired outcomes in the steady state

As we noted in the previous chapter, vulnerability and sovereign bond yields could increase in countries with high outstanding public debt and - to a lower extent - in stressed countries in the short-term. However, higher vulnerability and higher sovereign bond yields could be mitigated in the longer-run if the sovereign is willing to undertake fiscal adjustments. If not, high vulnerability and high yields could stabilise at their short-term levels.

⁴⁴ For example, if the Guidotti-Greenspan ratio which measures the ratio of short-term external debt to FX reserves, goes below 100 percent.

In Section 2 we set out the desired outcomes of the new regulatory proposals. Figure 13 summarises these outcomes and evaluates whether the limits on sovereign exposures would help reaching them.

Figure 13: Desired outcomes for the sovereigns and their fulfilment by introducing sovereign exposure limits in the steady state



6. Transition to a new regime

The state of current sovereign holdings reflects the incentives that are currently in place in the markets, for banks and for sovereigns. In order to avoid a costly structural break, any adjustment of regulation in this domain would thus require some kind of transition arrangement.

For the large exposure limit, grandfathering seems the most promising transition arrangement. Such a procedure would imply that the limit would only apply to new acquisitions of sovereign bonds. A large supply shock to secondary markets (see Table 6) would be avoided. At the same time banks would likely reduce their demand at primary auctions for some time. Sovereign debt management offices could also gradually re-arrange their investor base as maturities come due over time. Phasing in would be another viable option, decreasing the limit over a number of years.

Regarding the introduction of risk weights, the options are more complicated and also depend on the type of reform one would envisage. Moving from a regime of total exemption to, say, the actual StA appears to be the simplest step as risk weights are public and the computation is comparably simple (see Table 2). Furthermore, abstracting from changes in the rating that change the credit quality step, the risk weights would remain comparably stable. In such a case, one could apply a transition phase where the applicable risk weight would be adjusted over the course of multiple years with intermittent steps that slowly converge to the new risk weight. Such a transition phase would avoid abrupt changes and was applied for the introduction of the new CET1 ratio from Basel 2.5 to Basel 3 and for the introduction of the LCR, for example. For IRB risk weights, the transition may turn out more complicated as they themselves may be subject to more frequent change. Also, as they are generated by intransparent internal risk models, control may be more difficult. Nevertheless, again a gradual transition would be advisable.

Transition arrangements can only facilitate regulatory changes but cannot force banks to behave in a certain way. It may happen, for example, that stronger banks would be willing to take some losses in order to improve the perception that markets have of their riskiness. They could pre-empt regulation by frontloading the sale of excess sovereign debt. Banks could also lower their demand for new issues even before the regulation is in effect. Front-loading could for example be observed in the past, when capital requirements were increased. This could ultimately lead to a stigmatisation of banks that continue to hold on to large stocks of (riskier) sovereign debt.

The crucial element in the transition to the new regime are the price elasticities that are difficult to estimate, leaving the impact on sovereign bond prices difficult to predict. HTM portfolios, which are valued at book value, could be absorbers for the price effects. Given that a significant part of banks' sovereign exposures is ready to be sold immediately and banks' willingness to catch up quickly to the new requirements (supported by past experiences), a fast sell-off of sovereign bonds and the inherent price effects could be significant.

The quantitative easing policy of the ECB would provide a favourable backdrop to easing the transition towards lower sovereign holdings of banks. As described above, any serious reform of the regulatory treatment of sovereign exposures would affect the market balance of supply and demand of these assets. Hence, the current environment in which the ECB buys sovereign paper could be favourable to ensuring a smooth transition.

Lastly, the leverage ratio that was introduced under Basel III also mitigates the effects of the transition. Under the current regime, banks do not have to hold any capital for sovereign exposures according to the regular capital adequacy ratio. However, the leverage ratio assures that on average they hold capital to at least the amount of 3% of their balance sheet. This means that for banks that hold large sovereign exposures, the leverage ratio becomes the binding capital requirement. For illustration of this point, consider that in the extreme, a bank that only holds sovereign bonds currently would not have to hold any capital under the capital adequacy ratio requirement. However, the leverage ratio would still be binding for this bank and hence it would not start from zero when it would apply a new regulation to sovereign exposures.

7. Conclusions

The ESM as a rescue mechanism has a special interest in the stability of its member states and their banking sectors. This is the holistic perspective that we have taken throughout this paper. An adjustment in the treatment of sovereign exposures provides an avenue to improve stability but considering the complexity of the issue, a successful implementation of any measure would imply overcoming important risks and would thus require a thoughtful and balanced process.

As we have shown in the discussion above, the treatment of sovereign exposures in bank balance sheets affects two important sectors of the economy. Hence, while one could argue that this is purely an issue of bank risk management, this would be myopic as it ignores important effects on the sovereign and the economy as a whole, which in turn could feed back into the banking sector, at least in the short term. This fact puts increased emphasis on the transition arrangements and on the details of the regulatory treatment of sovereign exposures. Moreover, long-run implications, like pro-cyclicality of risk-weights and cliff-effects in the case of large exposure limits should receive adequate recognition.

Reforming the risk weighting of sovereign exposures or limiting banks' ability to accumulate exposure to a specific sovereign could reduce the impact of a potential crisis, because it would improve banks' ability to absorb losses, diversify portfolios, enhance risk transparency, and reduce systemic risk. It would also, given weaker ties between the two sectors' balance sheets, decrease the potential for twin crises in which sovereign stress would spread to the banking sector. At the same time, regulatory changes to the treatment of sovereign exposures could accelerate future crises by limiting funding options for sovereigns.

As banks would lower their demand for sovereign paper, either for cost reasons or because of hard limits, sovereigns would need to find new investors. Finding and dealing with a new investor base could prove very difficult, in particular for more stressed sovereigns and countries with small and illiquid sovereign debt markets. Additionally, new regulation would in practice decrease the absorption capacity of local investors. The latter are a very important investor base, as they tend to be more reliable and give cues to foreign investors. Sovereigns would need to adjust to the new market, and its potential challenges, such as more volatility, currency risks, or new requirements regarding sustainability.

Since banks' ability to accommodate temporary large swings in the financing needs of the sovereigns would be constrained, this could call for an improved fiscal framework at the European level, including a strengthened backstop mechanism like the ESM. A credible backstop should be in place to signal to investors that sovereigns have access to sufficient funds in case of need and ward off any short-term market fluctuations.

The effect of the new regulations on sovereigns depends on the modality and timing of the introduction. A gradual increase in the risk weights and a relatively long phase-in period could alleviate the pressure on sovereign debt markets and help avoid strained fiscal adjustments. In this way, both the banking sector and the sovereigns would have time to adjust, which could significantly lower the macroeconomic cost of the new regulations. Nevertheless, if banks frontload the regulation as was the case for some recent regulatory reforms, price effects might be substantial despite well-designed transition arrangements.

There are further important issues that could affect the overall impact of the new regulation. For instance, the geographical scope of regulation should be clarified. EU banks operating outside the euro area would face additional costs and liquidity risks from hedging exchange rate risks, as they would need to substitute their domestic sovereign exposures for similarly liquid assets in other currencies. Moreover, decreasing domestic demand for government bonds could incentivise non-EA sovereigns to issue foreign currency denominated bonds, which increases these countries' vulnerabilities. For these countries, an additional cost-benefit analysis should be carried out.

In addition, a precise definition of sovereign exposure is also indispensable, as it could significantly impact the adjustment needs. Regulation should be designed to address sources of credit or concentration risks. For instance, exposures to the central bank do not bear either credit or concentration risk, while constraining them could limit the effectiveness of monetary policy.

Finally, the lack of reciprocity at international level could result in a comparative disadvantage for banks under the new regulation and could motivate them to exploit regulatory arbitrage by changing their country of incorporation or by changing the legal status of subsidiaries to branches. Therefore, a coordinated approach would be more beneficial.

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