Risk weighting for government bonds: challenge for Italian banks

By Dominik Meyland and Dorothea Schäfer

Although banks are required to document their equity capital for loans, corporate bonds, and other receivables, they are currently exempted from the procedure when investing in government bonds: they enjoy an "equity capital privilege." As part of the Basel III regulatory framework redraft, the privilege may be eliminated in order to disentangle the default risks between sovereigns and banks. The present study examines how much additional equity capital the banks of the euro area's major nations would require if the equity capital privilege were eliminated. At nine billion euros, the estimates show the highest capital requirement for Italian banks. In comparison, French banks would only require additional capital of three billion euros and German banks would need just under two billion euros. Since eliminating the equity capital privilege would make the Italian state's consolidation efforts more difficult, it is advisable to risk weight newly purchased government bonds only or allow for long transition phases.

Since 2013, the Basel Committee on Banking Supervision (BCBS) has been negotiating the Basel III reform package for the regulatory framework for banks. The negotiations are currently at a standstill because the Trump administration has yet to send its delegation to the table, but the reforms are taking shape. The "output floor" is the main focus of controversy. By specifying a lower limit for the ratio of risk-weighted and total assets, it intends to prevent risks from being weighted too low.[1] In any case, it appears certain that the current general zero-risk weighting for government bonds from EU member states will be eliminated.

Capital requirements planned for EU government bonds

According to Basel III proposals and the EU Capital Requirements Directives (CRD) IV, banks must finance some portion of their investments with their own capital.[2] The capital requirement level depends on the risk weight of the asset value under consideration for investment.[3] This is the core of the Basel regulatory framework, the most recent draft of which is known as Basel III. The equity capital guidelines are designed to ensure that banks can absorb losses in cases of crisis without having to fall back on taxpayers.

However, the risk weighting conventions of bank assets as currently specified are controversial. Banks have an incentive to keep risk weights as low as possible in order to underestimate actual risks in their financial statements.[4] Low risk weights help banks save equity capital and in general, increase its returns. EU member state

1 See Andreas Dombret, "Basel III – goal within sight," (Keynote, Deutsche Bundesbank symposium "Banking supervision in dialogue," Frankfurt am Main, 2017) (available online) (accessed: April 07, 2017)

2 Capital Requirement Directive IV is the European guidelines for implementing Basel III within the EU's legal framework (available online) (accessed: June 6, 2017).

3 Also see the term "Equity ratio" in the DIW Glossary, (available online, in German only)

4 Dorothea Schäfer, "Regulierung der EU-Finanzmärkte," *Wirtschaftsdienst* 96 (anniversary edition) (2016): 563–570.

Box 1

Ratings and risk weights in the standard approach

According to the Basel III regulatory framework, every loan originated by a bank must receive a risk weight. The risk weight determines the share of equity capital the bank must have to back the loan. Low ratings mean higher risk for the bank. Banks are required to use higher shares of equity capital to finance loans with lower ratings, since the risk of default is higher, and they are supposed to cover any losses with their own capital. In the Basel III regulatory framework, the following risk weights apply (RW):[1] (see Table, Box 1)

Table

Risk weights according to Basel III

Rating	Risk weight
AAA	0%
AA+	0%
AA	0%
AA-	0%
A+	20%
A	20%
A-	20%
BBB+	50%
BBB	50%
BBB-	50%
BB+	100%
BB	100%
BB-	100%
B+	100%
B	100%
B-	100%
CCC	150%
CC	150%
C	150%

Source: Basel III.

1 See Basel Committee on Banking Supervision, "Basel III: International framework for liquidity risk measurement, standards and monitoring," (PDF, Bank for International Settlements, Basel, 2010) (available online).

bonds are an extreme case of risk underestimation: the current regulatory framework assigns a value of zero to their risk weight. The equity capital privilege rests on the assumption that interest and repayment claims against EU member states are risk-free. Due to this privilege, banks have been able to finance the purchase of EU government bonds using third-party capital only, by issuing their own bonds or using customer deposits, for example.

The European sovereign debt crisis debunked that notion and served as a reminder that even EU member states can skip their securitized repayment and interest payment claims. A whole string of European government bonds no longer has investment-grade ratings—they are considered junk bonds.[5]

The pending Basel III reform package will likely eliminate the equity capital privilege for EU government bonds. The new rules specify that the lower the EU member state's rating, the higher the proportion of equity capital required when investing in government bonds.[6] Assuming that the prevailing standard approach to credit risk will be applied to government bonds, pure debt financing will no longer be possible for bonds from nations with ratings lower than AA-. A bank that has already used up all of its equity capital for backing assets must either procure additional equity capital before making purchases of government bonds or cancel its plans. Banks would also require extra equity capital for the government bonds they already have on the books.

Within the proposed Basel III regulatory framework, the amount of equity capital required is always determined by the investment's risk weighting. For a corporate loan with a risk weight of 100 percent, the portion of equity capital for the loan amount granted would be eight percent. With a risk weight less than 100 percent, the portion of equity capital drops below eight percent, and higher risk weights push it above eight percent proportionally.

Banks have two options for determining the risk weight of an investment. Either they turn to the internal ratings-based (IRB) approach and calculate the investment risk

5 Investment-grade bonds are bonds with good to excellent creditworthiness, i.e., ratings between AAA and BBB (including Baa3 and BBB-). Many institutional investors, such as pension funds, are required to invest only in investment-grade bonds. Bonds with ratings below investment grade are considered speculative investments. The rating agencies put Greece, Croatia, Portugal, and Cyprus below the investment-grade level, for example.

6 Basel Committee on Banking Supervision, "The regulatory framework: balancing risk sensitivity, simplicity and comparability," (Discussion Paper, Bank for International Settlements, Basel, 2013) (available online) (accessed: June 13, 2017). The debt of certain public institutions and subordinate regional authorities also has a weighting of zero. See Wissenschaftlicher Beirat beim Bundesministerium der Finanzen, "Der Staat als privilegierter Schuldner – Ansatzpunkte für eine Neuordnung der öffentlichen Verschuldung in der Europäischen Währungsunion" (PDF, Federal Ministry of Finance, Berlin, 2014) (available online, in German only) (accessed: June 13, 2017).

themselves, or they use an external rating and specify the risk weight using the standard approach. A rating agency that is registered with the European Securities and Markets Authority (ESMA) and recognized by national banking supervision authorities that regulate risk weighting must provide the external ratings.[7]

Based on the ratings, the standard approach determines the portion of equity capital with which the investment in a specific asset category must be financed. If the equity capital privilege were eliminated, this would also apply for investments in EU government bonds, which until now have generally carried risk weights of zero. The three major ratings agencies publish a rating for each EU member state on a regular basis. Based on their ratings, it is possible to determine the additional capital that would result from the capital adequacy requirement.

Estimating the additional equity capital required by European banks

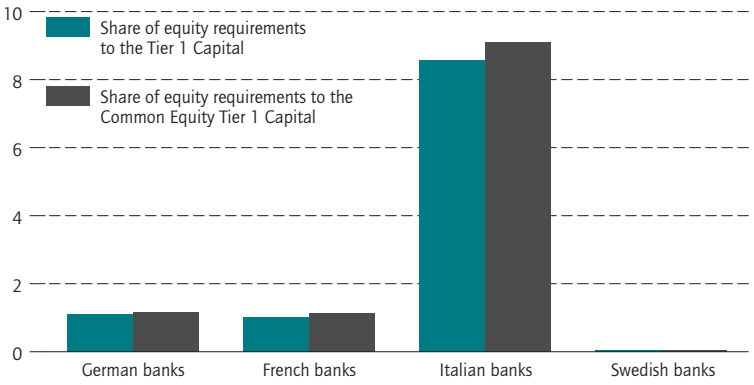
The capital requirements resulting from lifting the equity capital privilege for EU government bonds is estimated for the three largest euro area countries: Germany, France, and Italy. For purposes of comparison, the capital requirements for the Swedish banks which had consistently excellent results in past stress tests is also assessed.[8] The underlying data on sovereign exposure are from the European Banking Authority (EBA) stress tests for banks conducted in 2014 and 2016.

Data basis

As part of its stress tests in 2014 and 2016, the EBA collected statistics on bank investment in government bonds. The data were collected on December 31, 2013 and December 31, 2015 and grouped according to country and maturity date before publication.[9] With nine German, six French, and five Italian banks, the total number of banks tested was lower in 2016 than in 2014. For purposes of comparison, we estimated the capital requirements only for the banks that participated in both stress tests. Only the bank investments in the government bonds of the 28 EU member states were relevant for the estimate.[10] We used credit ratings issued by Fitch Ratings.[11]

Figure 1

Additional capital needs in relation to the existing Tier 1 capital
In percent



Sources: EBA; authors' own calculations.

The additional capital needs of the Italian major banks are substantial, relative to the existing equity capital.

Methodology

To determine the additional capital requirement, we assigned the risk weight resulting from the standard approach to each bank's investment in EU government bonds. We estimated their additional capital requirement (ACR) using the following equation:[12]

$$ACR = \Sigma_{i=1}^{28} RW_i \times 8\% \times SE_i,$$

in which RW_i describes the risk weight of the government bonds of the ith EU member state (see Box 1) and SE_i the extent of the bank's investment in the government bonds of the ith EU state. At a risk weight of 100 percent, the capital requirement for investments in the government bonds of the ith state equals 8 percent. The sum of the capital requirements resulting from all the bank's investments in EU government bonds equals the bank's ACR.

7 Steffen Nauhaus and Dorothea Schäfer, "Nur beschränkt nachvollziehbar: Länderratings während der Krise im Euroraum", *Wirtschaftsdienst* 95 (2015): 678–683; Hans-Helmut Kotz und Dorothea Schäfer, "Rating-Agenturen: Fehlbar und überfordert", *Vierteljahrshefte zur Wirtschaftsforschung* 82 (2013): 135–162.

8 Also see Dorothea Schäfer and Dominik Meyland, "Stricter capital requirements for investing in EU government bonds as a means of creating a more stable financial system," *DIW Economic Bulletin* no. 20 (2015): 269–280 (available online)

9 The data sets from the 2016 stress test are available online on the EBA website.

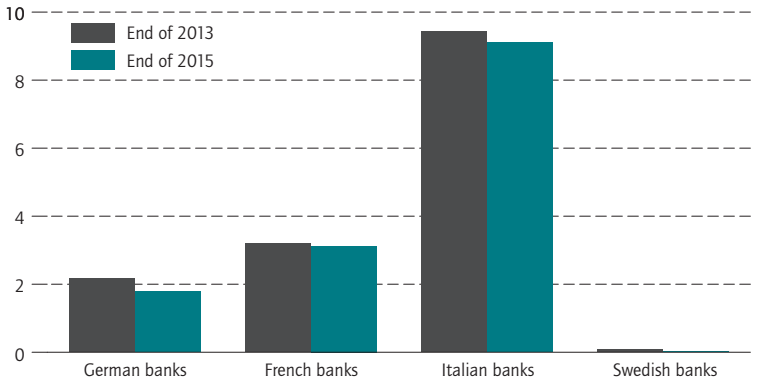
10 The data collection dates from the most recent stress test pre-dates the Brexit referendum. This is why Great Britain is still included.

11 The ratings of EU member states are available on the Fitch Ratings website.

12 See Basel Committee on Banking Supervision, "Basel III: International framework for liquidity risk measurement, standards and monitoring," (PDF, Bank for International Settlements, Basel, 2010) (available online).

Figure 2.1

Additional capital needs
In billion Euro

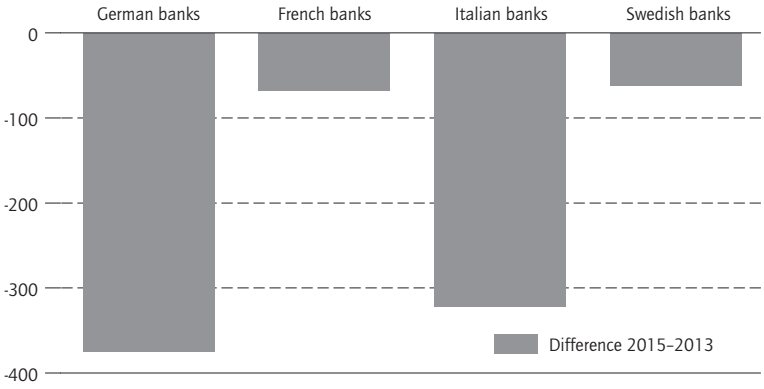


Sources: EBA; authors' own calculations.

The Italian banking sector would be severely affected by new capital requirements for government bonds of EU-member states.

Figure 2.2

Development of capital needs
In million Euro



Source: Authors' own calculations.

The potential additional capital needs for bank holdings of EU-government bonds have somewhat declined between 2013 and 2015.

Additional capital requirement highest for Italian banks

The results of the estimate show that Italian banks would feel the impact of the revised regulation the most. German banks would need only around 1.8 billion euros in additional equity capital, equal to one percent of the existing regulatory equity capital (see Figure 1). At 9 billion euros of additional equity capital, the Italian banks would be much more strongly affected (around 8 percent of the total regulatory equity capital of the Italian banks in the stress test). The primary reason for this is that Italian banks hold relatively large amounts of Italian government bonds: their government bond portfolios have a home bias.[13] On the collection date, Italian government bonds had a Fitch Rating of BBB+, yielding a risk weight of 50 percent based on the standard approach. For each euro invested in the purchase of an Italian government bond, the banks would have to finance four cents out of their own funds. For Italian government bonds worth 100 million euros, a bank would need four million euros in additional equity capital. As a consequence of the combination of their home bias and comparatively unfavorable ratings, the planned change in the regulatory framework would confront Italian banks with a major challenge.

The 2016 stress test showed that major French banks had invested in Italian government bonds to a significantly greater extent than their German counterparts and would need a total of 3 billion euros in additional equity capital. Compared to German, French, and Italian banks, the additional capital needs of Swedish banks are extremely small. They would only need 19 million euros in additional equity capital.

Small reduction in government bond holdings since the 2013 stress test

Comparing the investments in EU government bonds across the two stress tests mentioned above, it appears that the additional capital needs of the German, French, Italian, and Swedish banks participating in the stress test decreased slightly between the end of 2013 and the end of 2015 (see Figure 2.1 and Figure 2.2). We continued to see substantial holdings of comparatively risky government bonds at Commerzbank, Deutsche Bank, and NRW.Bank, however (see Figure 3). Countering the trend, Commerzbank's activity in risky EU government bonds has not abated. Instead, the bank's holdings have increased. Like other major banks, however, Commerzbank scaled back on the proportion of Italian government bonds on its balance sheet total (see Figure 4), but its investment in Italian government bonds has remained high. All in all, it would need just under 900 million euros of additional equity capital. The German banks in the 2016 stress test reduced their govern-

13 "Home bias" is a term that is often used in conjunction with portfolio structure. It implies that a bank's portfolio contains a disproportionate number of assets from its own country. The investment decision is influenced by a preference for home-country assets.

ment risk and the associated additional capital requirement by almost 20 percent between the end of 2013 and the end of 2015. German banks also exhibited a strong home bias, but German government bonds have an AAA rating. Unlike the Italian banks, the German banks' home bias is thus inconsequential regarding the banks' capital needs.

Compared with other EU member states, the stress test showed that French banks only reduced their risk slightly. At the end of 2015, they had almost as much risk from EU government bonds on their books as they did at the end of 2013 (see Figure 5). Their additional capital requirement had declined by around only 2 percent since the end of 2013 and was three billion euros.

Major Swedish banks would hardly be affected by the elimination of the equity capital privilege for EU government bonds (see Figure 6). They would require a mere 19 million euros in additional equity capital for their existing investment in EU government bonds if required to hold equity capital in the future. The amount equals 0.03 percent of the total equity capital of the Swedish banks participating in the stress test.

Comparing the current capital requirement for government bonds in the Italian banking sector with that of the earlier stress test showed that here, too, the additional capital requirement somewhat declined. However, the Italian banks in the stress test would still have to document significantly more equity capital than if the equity capital privilege falls (see Figure 7). Although some banks have reduced their investments in Italian government bonds (see Figure 8), at nine billion euros the additional capital requirement in the Italian banking sector remains high.[14]

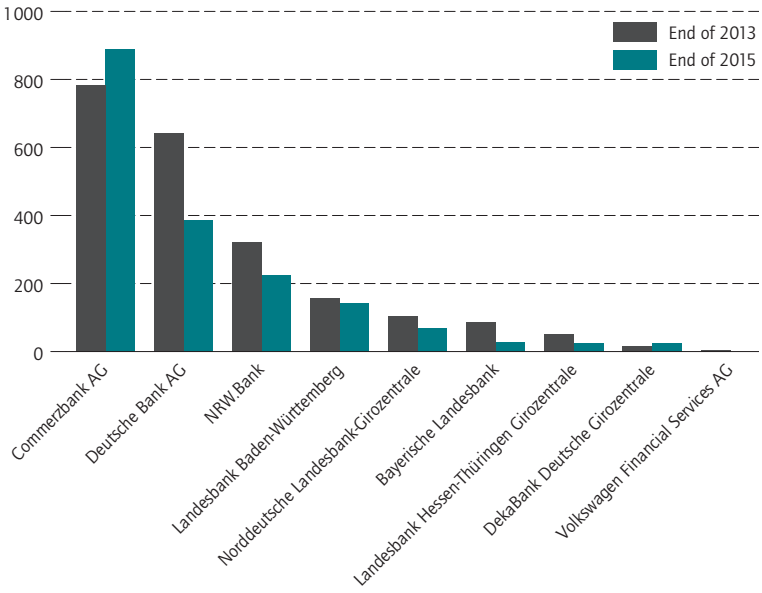
Italy: challenges for banks and the state

If the new capital requirements for EU government bonds do take effect, Italian banks will either need to accumulate substantially more equity capital or cull some of the Italian government bonds from their portfolios. In December 2016, the ailing Italian bank Monte dei Paschi di Siena (MPS) failed to raise capital from private investors. In general, it is an open question whether sufficient equity funds could be acquired in the capital market,[15] although in the past some Italian banks have successfully raised equity capital in this way. For example, Unicredit accomplished the largest capital increase in the history of Italy in spring 2017 when it raised 13 billion euros. However, it is questionable whether shareholders

Figure 3

Additional capital needs of German banks

In million Euro



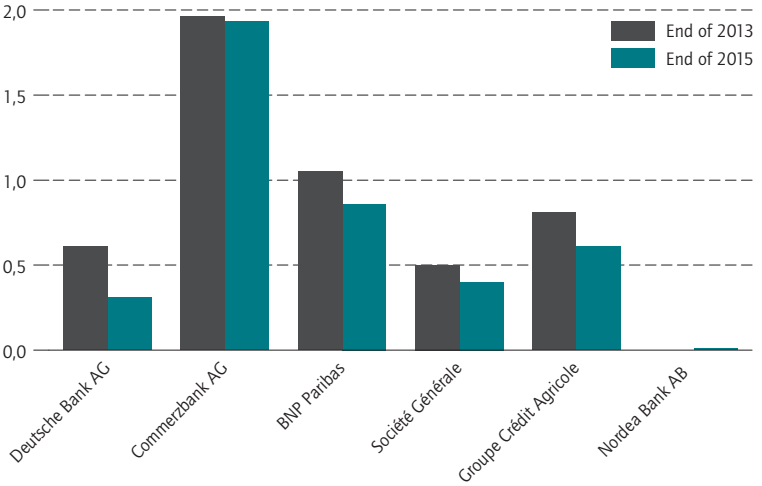
Sources: EBA; authors' own calculations.

Among the German banks, Commerzbank would be most affected by the introduction of risk weights for government bonds of EU member states.

Figure 4

The share of Italian government bonds in the balance sheets of major European banks

In percent



Sources: EBA; authors' own calculations.

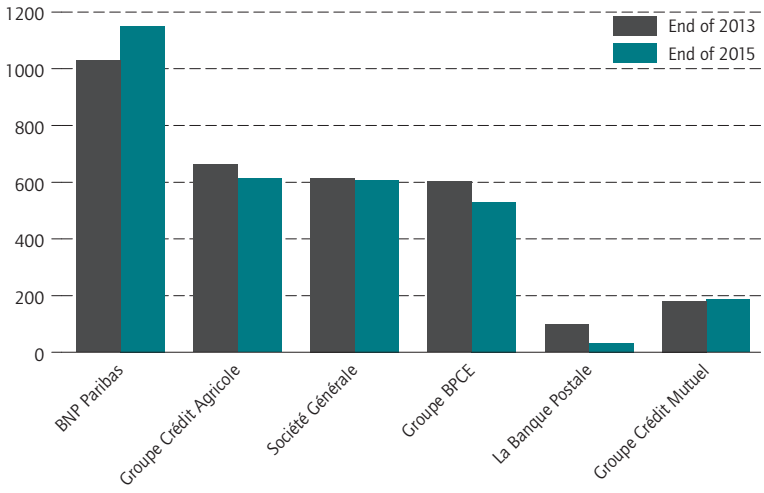
Many major European banks have reduced the share of Italian government bonds in their balance sheets between end of 2013 and end of 2015.

14 We use "additional capital requirement" and "capital requirement for government bonds" interchangeably.

15 Monte Dei Paschi Di Siena, (Press release, 2016) (available online).

Figure 5

Additional capital needs of French banks
In million Euro

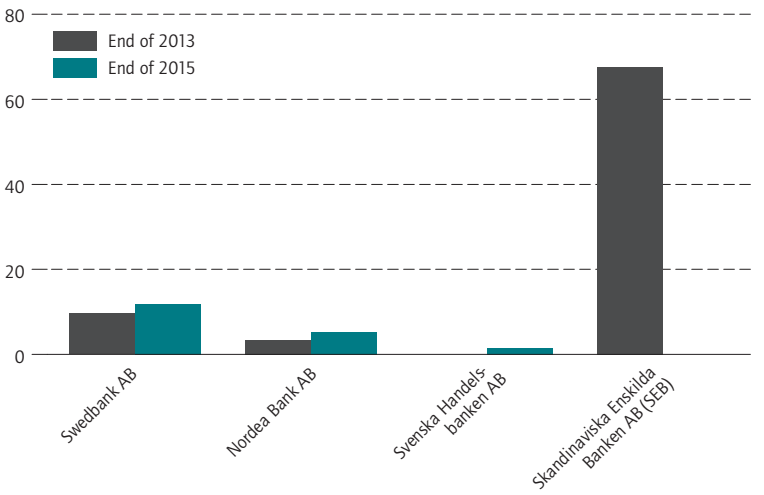


Sources: EBA; authors' own calculations.

For some French banks the equity requirements have slightly decreased.

Figure 6

Additional capital needs of Swedish banks
In million Euro



Source: Authors' own calculations.

The Swedish banks would be hardly affected by the new capital requirements.

would share the burden of further capital increases to the same extent. Ultimately, this will depend on whether the economic situation of the Italian banks has substantially improved by the time the new regulatory framework goes into effect and they can significantly reduce the number of non-performing loans on their books.

The Italian government put together a 20-billion-euro bank rescue package for domestic banks with funds earmarked for recapitalization. Around nine billion euros have been set aside to shore up MPS's equity capital, the lion's share of which will come from the rescue fund. At least five billion euros will be required to cover depositor and senior bondholder losses as two recently failed banks, Banca Populare di Vicenca and Veneta Banca, are currently being wound up. Additional capital injections are foreseeable—after all, over 15 percent of bank loans in Italy are considered at risk of default.[16] As a result, the rescue package for the Italian banking sector could be too small to cover the additional capital requirement that would result from eliminating the equity capital privilege for the government bonds of EU member states.[17] However, expanding the rescue program would force up Italy's already high level of sovereign debt.

Alternatively, Italian banks could restructure their portfolios if the capital adequacy requirement is implemented for EU government bonds. Reducing the portion of domestic government bonds in their financial statements would increase their immunity to the new capital requirements. Unfortunately, this type of adjustment in investment behavior would have negative consequences on refinancing Italian government bonds. The examined Italian banks hold a solid eight percent of outstanding domestic government bonds. If the banks reduced their investments, it would have a palpable effect on demand for these bonds. Their interest rates would rise first due to diminished demand, and second, because the risk premium on equity capital would also raise the cost of government bond purchases (see Box 2). Such a development would present a major challenge to the effort to consolidate the Italian budget, making this process more difficult. And if the interest rate on Italian government bonds were to rise, it would have an effect on the stability of the common currency.

16 Benoit Mesnard and Christina Katopodi, "Non-performing loans in the Banking Union: state of play," (Briefing, Economic Governance Support Unit (EGOV) of the European Parliament, Brussels, 2017) (available online) (accessed: June 28, 2017).

17 European Central Bank, "Financial Stability Review," (PDF, European Central Bank, Frankfurt, 2016) (available online).

Conclusion

The Basel Committee on Banking Supervision presented its first draft of the Basel III revision in 2013.[18] In addition to other concerns, it took issue with the general zero risk weighting of EU government bonds. After the Basel III reform package goes into effect, investments in government bonds could be handled like loans or investments in corporate bonds: they must be backed by an adequate amount of equity capital.

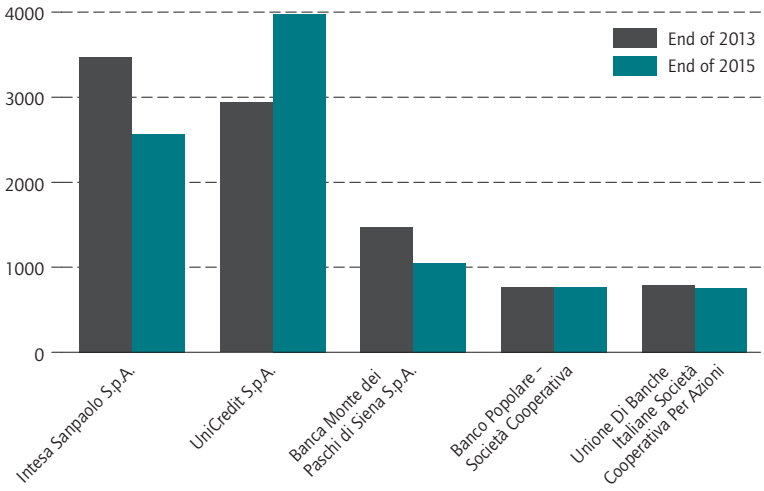
Between 2013 and 2015, the major banks in Germany, France, and Italy reduced their holdings of EU government bonds only moderately. Given the European Central Bank's Public Sector Purchase Programme, the persistent presence of government bond portfolios at major European banks is surprising. Presumably, within the program, banks have been able to sell government bonds at higher prices than before. These findings and the persistence of home bias in the banks' government bond portfolios indicate that applying capital adequacy requirements to achieve the desired decoupling of sovereign default risk from national banks would at least be ineffective in the short term.

Due to the comparatively weak rating of Italian government bonds, the Italian banking sector would have to increase its equity base significantly. However, this could hamper the Italian state's consolidation efforts. These consequences must be considered if the aim of implementing risk weights for EU government bonds, sensible in principle, is to be pursued.

In order to reduce the additional capital requirements that would arise, lawmakers could stipulate that the capital adequacy requirement be applied only to new purchases of government bonds and not existing holdings. The new regulatory framework would in every case cause the interest rate on new issues to rise. For states with high levels of sovereign debt, this would represent a major challenge.

Figure 7

Additional capital needs of Italian banks
In million Euro

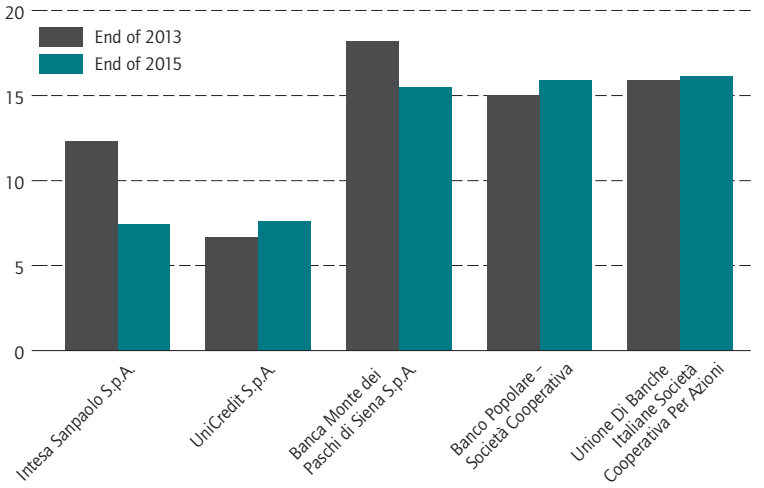


Sources: EBA; authors' own calculations.

Italian banks would need significantly more equity capital in case of introducing risk weights for government bonds of EU member states.

Figure 8

Share of Italian government bonds in the balance sheet of Italian banks
In percent



Sources: Banks' annual reports; authors' own calculations.

The shares of domestic government bonds in the balance sheet of the Italian banks in the stress test are still high.

18 Basel Committee on Banking Supervision, "The regulatory framework."

Box 2

Higher capital requirements raise interest rates on low-rated government bonds

According to Basel III, banks must use equity capital to finance the loans they extend. The minimum share of capital depends on the borrowing entity's rating. When a bank purchases newly issued government bonds, it is virtually the same as (securitized) lending to the state. All other things equal, the interest rate that loan recipients must pay depends directly on the interest rate the bank must pay on the funds it uses to finance the loan. Assuming the absence of arbitrage, the interest rate R of amount B of the loan granted (in this case, "government bond") is equal to the sum of the interest rates r that the bank pays for own borrowing and the weighted equity capital risk premium, $ROE\text{-}r$, where the weighting factor is the capital share $\frac{K}{B}$:

$$R = r + (ROE\text{-}r) \times \frac{K}{B} \quad (1)$$

For loans extended to an EU member state (purchase of an EU government bond), the regulatory framework currently specifies an equity requirement K of zero (the equity capital privilege). If the equity capital privilege were eliminated, K>0 would take effect for the purchase of low-rated EU government bonds and the financing costs for banks would rise (the right-hand side of equation (1) becomes larger). If the bank does not want to suffer a loss, it must pass its higher funding costs on to the government by requiring a higher interest rate R. Thus, low rated EU government bonds would have to have higher interest coupons than is the case under the current regulatory framework.

Dominik Meyland is a Research Assistant in the Department of Macroeconomics and the Department of Forecasting and Economic Policy at DIW Berlin | dmeyland@diw.de

Dorothea Schäfer is the Financial Markets Research Director at DIW Berlin | dschäfer@diw.de

JEL: G20, G28, G01

Keywords: Basel III, bank capital requirements, government bonds, bank-sovereign nexus

DIW BERLIN

DIW Berlin — Deutsches Institut
für Wirtschaftsforschung e. V.
Mohrenstraße 58, 10117 Berlin
T +49 30 897 89 -0
F +49 30 897 89 -200

Publishers
Prof. Dr. Tomaso Duso
Dr. Ferdinand Fichtner
Prof. Marcel Fratzscher, Ph.D.
Prof. Dr. Peter Haan
Prof. Dr. Claudia Kemfert
Prof. Dr. Lukas Menkhoff
Prof. Johanna Mollerström, Ph.D.
Prof. Karsten Neuhoff, Ph.D.
Prof. Dr. Jürgen Schupp
Prof. Dr. C. Katharina Spieß
Prof. Dr. Gert G. Wagner

Reviewer
Dr. Simon Junker
Dr. Kati Krähnert

Editors in chief
Dr. Gritje Hartmann
Dr. Wolf-Peter Schill

Editorial staff
Renate Bogdanovic
Dr. Franziska Bremus
Prof. Dr. Christian Dreger
Sebastian Kollmann
Markus Reiniger
Mathilde Richter
Miranda Siegel
Dr. Alexander Zerrahn

Layout and Composition
eScriptum GmbH & Co KG, Berlin

Sale and distribution
DIW Berlin
ISSN 2192-7219