



GERMANY

FINANCIAL SECTOR ASSESSMENT PROGRAM

June 2016

SYSTEMIC LIQUIDITY AND BANK FUNDING— TECHNICAL NOTE

This Technical Note on Systemic Liquidity and Bank Funding on Germany was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed in June 2016.

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Prepared By
**Monetary and Capital
Markets Department**

This Technical Note was prepared in the context of an IMF Financial Sector Assessment Program (FSAP) mission in Germany during November 2015 led by Ms. Michaela Erbenova. It contains technical analysis and detailed information underpinning the FSAP's findings and recommendations. Further information on the FSAP can be found at <http://www.imf.org/external/np/fsap/fssa.aspx>

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Glossary

BIS	Bank of International Settlements
DZ Bank	Deutsche Zentral-Genossenschaftsbank
CCP	Central Counterparty Clearing House
ECB	European Central Bank
ECBC	European Covered Bond Council
EFAMA	European Fund and Asset Management Association
EONIA	Euro Overnight Index Average
EU	European Union
Eurepo	Euro Repurchase reference rate
EURIBOR	Euro Interbank Offered Rate
GDP	Gross Domestic Product
GFSR	Global Financial Stability Report
GMRA	Global Master Repurchase Agreement
HQLA	High Quality Liquid Asset
ICMA	International Capital Market Association
IKB	IKB Deutsche Industriebank
KfW	Kreditanstalt für Wiederaufbau
LB	Landesbank
LBBW	Landesbank Baden-Württemberg
LCR	Liquidity Coverage Ratio
LR	Leverage Ratio
MB	Mortgage Bank
NSFR	Net Stable Funding Ratio
OECD	Organization for Economic Cooperation and Development
Pfandbriefe	German covered bonds
PSPP	Public Sector Purchase Program
Repo	Repurchase contract
SME	Small and Medium Enterprise
SoFFin	Sonderfonds Finanzmarktstabilisierung
VDP	Verband Deutscher Pfandbriefbanken (Association of German Pfandbrief Banks)
WGZ Bank	Westdeutsche Genossenschafts-Zentralbank

EXECUTIVE SUMMARY

There is concern at a global level about the decline in market liquidity, especially for fixed income assets, and its resilience. The IMF's October 2015 Global Financial Stability Report (GFSR) analyzed these issues in depth and pointed out the effects on market liquidity from transformations in financial markets (including changes in the regulatory environment), the growing importance of more homogenous buy-side institutions, and the effects of unconventional monetary policy.¹

Concerns about market liquidity are relevant in Germany. The financial system is dominated by banks and is generally sound and robust to shocks. Although banks on aggregate rely on deposits for funding to a greater extent than many other advanced economies, certain types of financial institutions rely on market funding. Smooth functioning of short- and long-term funding markets is therefore important. This technical note focuses on the current state of the principal markets for non-deposit based funding for German financial institutions. A key finding is that although the current *level of liquidity* of the banking system is abundant, underpinned by active central bank support, the *resilience of liquidity* in some bank funding markets appears less than in the past. The April 2015 Bund tantrum, though short-lived, is an indication that market liquidity can be fragile even in Germany's otherwise liquid markets.

The German banking system has undergone significant change in recent years. Recent global and Euro area crises exposed weaknesses in German bank funding practices that were previously not evident, and precipitated further change. A number of large institutions had to be rescued and the need for new business models became clear. The banking system has continued to consolidate since the crisis began, driven in part by financial difficulties in some large institutions, and business models have begun to adapt. Central bank actions, culminating in the initiation of quantitative easing and move to negative policy rates, have led to a prolonged period of low interest rates and a flat yield curve, exacerbating long-standing problems of low bank profitability. All of these movements are taking place against the backdrop of significant post-crisis global regulatory change aimed at improving the liquidity and stability of bank balance sheets. These developments pose challenges for bank funding conditions and practices.

The legacy of the crisis has been a shift in the availability, form and cost of funding for German banks. Short-term markets have contracted significantly, including for instruments such as repurchase transactions that have been important to market liquidity in the past, and will face further challenges from negative interest rates. Longer-term markets, even for collateralized instruments such as covered bonds, are more domestically focused, potential issuance sizes are smaller, maturities are shorter, and the depth of markets is constrained by the absence of robust secondary market trading. Markets will face further challenges as they adapt to the impact of quantitative easing and the implementation of liquidity, leverage and stable funding regulations.

¹ See Chapter Two, Market Liquidity—Resilient or Fleeting? International Monetary Fund, Global Financial Stability Report, October 2015.

Although ECB liquidity injections are currently ensuring a high level of liquidity in the system, actions may be considered to help support the functioning of short-term markets going forward. Measures to improve the flexibility of interbank markets, and in particular to facilitate the transfer of excess liquidity within and across the banking pillars, could help ensure that excess savings can continue to be intermediated efficiently. Elimination of barriers to competition and consolidation among banks, particularly within the savings banks and credit cooperatives sectors, could help promote this objective. The authorities should monitor the repurchase market closely and be prepared to provide support if private sector flows are inadequate, secondary markets dry up and volatility becomes excessive. A liquidity backstop for the system is already in place through the Eurosystem's securities lending program, which provides an institutional framework that could be adapted to a broader range of collateral and pricing in the event of need. Although it is too early to consider recalibration of recent international regulatory measures that may be adversely affecting repurchase market liquidity, the impact of these measures on bank funding and broader financial markets will need to be monitored carefully. The authorities may also wish to follow up on the recent survey on interest rate sensitivity of bank balance sheets by requiring financial institutions to indicate how they will manage the risks to their profitability and funding prospects that would be posed by a further reduction in interest rates and/or flattening of the yield curve. Similarly, banks should prepare for an eventual transition to higher interest rates. Funding strategies for those institutions most at risk in the event of a sharp rise in interest rates should be adapted to reduce the mismatch between fixed rate assets and floating rate liabilities.

Measures to improve the resilience of liquidity in the long-term markets should be explored in order to facilitate the adjustment of financial portfolios that will result from the ongoing implementation of regulatory reform. Steps to promote robust secondary trading will underpin investor confidence and thereby ensure efficient pricing and adequate absorptive capacity. Improvements in the efficiency and liquidity of broader long-term debt markets will also benefit covered bonds, which is of special importance in light of the allowed inclusion of a large proportion of such bonds as HQLA assets for purposes of calculation of the LCR. Ultimately, action to mitigate the transitional costs of monetary easing and regulatory reforms on essential and desirable market functionality will contribute to the successful implementation of these policies.

Most of the issues highlighted in this report are not likely to be a source of immediate concern, but rather need to be addressed to ensure the stability of the system over the medium term and to facilitate its transition to a post-crisis environment. The current highly liquid state of many markets, while posing its own challenges, also provides an opportunity to address underlying structural inefficiencies of the system with lower cost than might otherwise be the case.

Table 1. Main Recommendations	
Recommendation	Priority
Improve the flexibility of interbank markets by facilitating the transfer of excess liquidity within and across the banking pillars. Measures to further the on-going consolidation of savings banks and cooperative banks and to encourage development of additional cross pillar financing mechanisms should be considered.	Medium
Monitor repurchase markets closely and be prepared to provide support if secondary markets dry up and volatility becomes excessive.	Medium
Follow up on survey of interest rate sensitivity of bank balance sheets by asking for action plans of measures to manage risks to profitability and funding of a further reduction in interest rates and/or flattening of the yield curve. Sensitize banks to risks of eventual transition to higher rates.	Medium
Review factors adversely affecting the participation of financial intermediaries and reducing the resilience of liquidity in the long-term markets, so as to be able to accommodate the additional demand for long-term bond issuance resulting from regulatory reform.	Medium

BACKGROUND²

1. The German banking system consists of a large number of banks (1,783 institutions at end-September 2015) in three main pillars (Table 2): private commercial banks, public sector banks, and cooperative banks (accounting for 39 percent, 27 percent, and 14 percent, respectively of total banking system assets). There are also a number of specialized banks, including mortgage finance institutions and special purpose banks, together accounting for about 20 percent of total banking system assets.

2. The global financial crisis exposed strains in German bank funding practices. As liquidity conditions deteriorated from mid-2007, German banks experienced difficulties in obtaining short-term U.S. dollar funding, which had earlier been an important source of finance provided mainly by U.S. money market funds for some institutions. The run on U.S. money market funds following the breaking-of-the-buck by one of the largest U.S. funds meant that money market funds were forced to reduce their holdings of European bank paper along with other investments.³ Investors in euro area money market funds also withdrew a significant amount of funding beginning in mid-2007 and accelerating in the latter part of 2008 when Lehman Brothers defaulted. Funding on the short-term interbank market became difficult, and the spread between unsecured (EURIBOR) interest rates and secured (Eurepo) rates increased sharply.⁴ The key covered bond (Pfandbriefe) market also experienced unprecedented illiquidity in the period leading up to and immediately following the Hypo Real Estate crisis, with secondary markets overwhelmed by sell orders and a complete shutdown of the new issue market for many institutions.⁵

3. Repurchase markets among banks, which earlier had been a reliable source of collateralized short-term finance for many institutions, contracted sharply as the crisis evolved. Uncertainty about the true value of certain securities offered as collateral, and more importantly, concerns about the liquidity of markets on which assets could be sold, along with increased perceptions of counterparty risk, resulted in a rapid decline in banks willing to provide such financing. Haircuts increased and repo costs rose sharply. In addition, borrowers were less willing to lend out high-quality collateral owing to concerns about whether it would be returned in

² This Technical Note was prepared by Robert Sheehy, IMF External Expert as part of the 2016 FSAP of Germany. The mission would like to thank the German authorities, EU authorities and market participants for their excellent cooperation and open dialogue.

³ Baba, Naohiko, Robert N. McCauley and Srichander Ramaswamy, U.S. Dollar Money Market Funds and Non-U.S. Banks, *BIS Quarterly Review*, March, 2009.

⁴ Nagel, Joachim, The Consequences of an Ineffective Money Market, *Revue d'économie financière*, No. 111, September 2013.

⁵ Kofner, Stefan, The German Pfandbrief System facing the Financial Crisis, *European Network of Housing Research papers*, 2010.

Table 2. Structure of the Banking System, September 2015

	Pillar I Private Commercial Banks	Pillar II Public Sector Banks	Pillar III Cooperative Banks	Mortgage Finance Institutions	Special Purpose Banks
Number of institutions	271	423	1,033	37	19
Total assets (EUR bn)	3,089	2,147	1,085	576	978
Total assets (% bk system)	39	27	14	7	13
Main institutions	Deutsche Bank ¹ Commerzbank HypoVereinsbank ³	6 Regional Landesbanken (LBs) ² Dekabank	DZ Bank WGZ Bank	16 Mortgage banks (MBs)	KfW
Other institutions	160 Regional banks 107 Foreign banks	414 Savings banks	1,031 Cooperative banks	21 Building and loan societies	16 state development banks Specialized banks
Legal form	Corporation	Public law institutions	Credit cooperative	Corporation	Corporation
Ownership	Private shareholders	Public supervision ⁴	Members	Private or public	Public (development banks) or mixed (specialized banks)
Client base	Domestic and international	Regional retail and SMEs	Regional retail and SMEs	Domestic retail, public sector	Export sector, fin. institutions
Main products	Up to full range of banking services	Retail/SME loans (savings banks) Wholesale banking (Landesbanken) Asset management (Dekabank)	Retail/SME loans Wholesale banking (DZ, WGZ)	Property, mortgage loans	Export finance, co-lending
Main funding sources	Capital market, deposits	Capital market (LBs), deposits	Deposits	Capital market (MBs), deposits	Capital market
<p>¹ Including Deutsche PostBank (majority-owned subsidiary).</p> <p>² There are eight Landesbanken if Bremer LB (a subsidiary of NordLB) and LB Berlin (which has been converted into a savings bank) are counted separately. The six Landesbanken discussed in this note are LBBW, BayernLB, NordLB, Helaba, HSH Nordbank, and LB Saar.</p> <p>³ Wholly-owned subsidiary of UniCredit Bank Group (Italy).</p> <p>⁴ Savings banks have no shareholders, but are supported by a relevant public body. Landesbanken are owned mainly by regional savings banks and state governments. Dekabank is owned by the regional savings banks.</p>					

the event of default by the lender or by other institutions involved in the re-hypothecation of that collateral. As a result, repo funding fell from almost 60 percent of German bank's short-term wholesale financing prior to the crisis to only about 35 percent after the failure of Lehman Brothers.⁶

4. Institutions with heavy reliance on capital markets funding (large commercial banks, Landesbanken, mortgage finance institutions) were hard hit by these developments, while those funded mainly by customer deposits (savings banks, cooperative banks) were relatively unaffected. Several institutions had to be rescued by the government, initially through direct government guarantees and injections of capital,⁷ and subsequently through financing and guarantees provided by the Sonderfonds Finanzmarktstabilisierung (SoFFin), a special emergency funding mechanism set up in October 2008. Total government support for the banking system amounted to about 24 percent of 2008 GDP as of mid-2009.⁸ More general support for short-term funding markets was provided by coordinated injections of central bank liquidity, leading to a significant decline in interest rates across the euro area and internationally.⁹

5. The eruption of the euro area financial crisis in 2010 led to additional strains on banks in Germany. All banks in the euro area, even the strongest, experienced difficulties in access to funding, even at higher cost.¹⁰ Interbank funding costs rose sharply for both the euro and other currencies. U.S. money market funds steadily reduced their exposure, removing what had been an important source of funding for many banks, before stabilizing at a low level. There was also a widespread deterioration of bank credit ratings, partly reflecting a lower expectation of state support for the sector, which made unsecured borrowing by many banks more difficult and more costly.

6. As the crisis continued, the ECB injected significant amounts of liquidity into the system to bring costs down and ensure the effectiveness of monetary policy transmission across the euro area. Although some liquidity was provided to specific markets through purchases of covered bonds and certain other securities, the net impact on overall liquidity of such operations

⁶ Düwel, Cornelia, Repo Funding and Internal Capital Markets in the Financial Crisis, Deutsche Bundesbank Discussion Paper 16/2013, March 2013, pp. 5-8. Initially, repo funding could be replaced by other short-term financing, but alternative sources also dried up after the Lehman Brothers failure.

⁷ Four banks (IKB, Westdeutsche Landesbank, Bayern Landesbank and Sachsen Landesbank) received capital injections, credit lines and asset-backed security loss guarantees between August 2007 and September 2008. The large resources needed for the rescue of Hypo Real Estate at end-September 2008 made it clear that the more systematic approach provided by SoFFin was required.

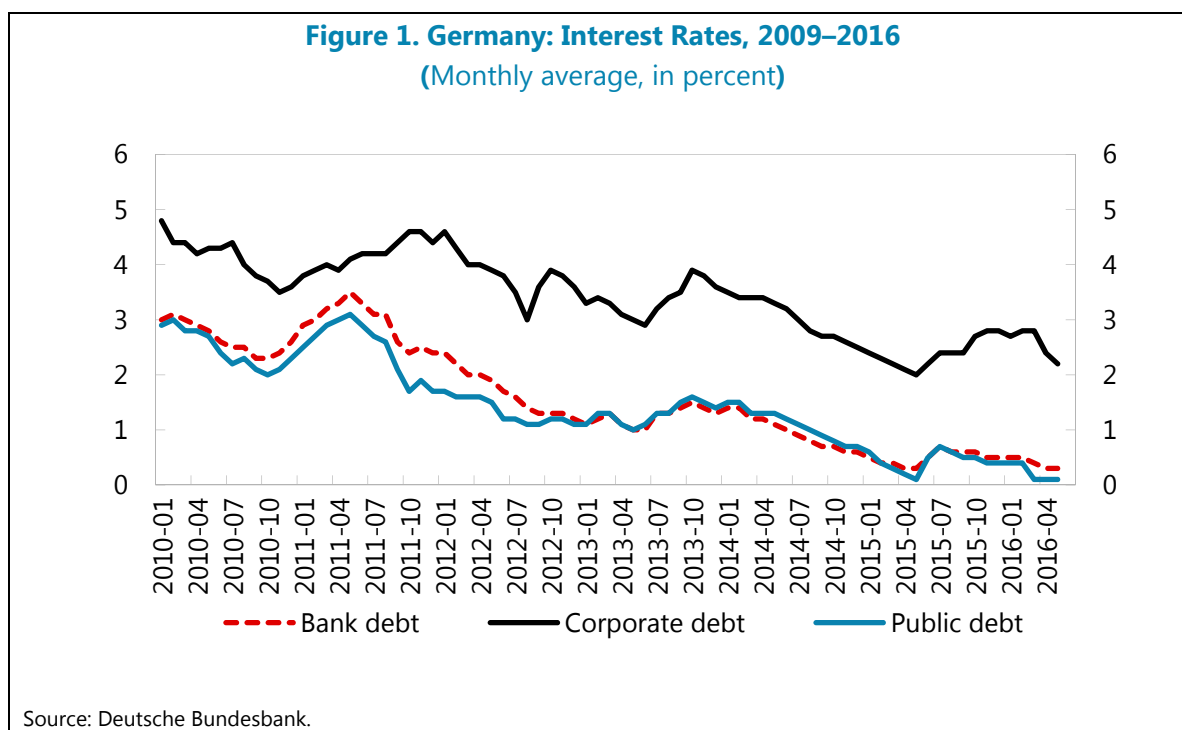
⁸ Hüfner, Felix, The German Banking System: Lessons from the Financial Crisis, OECD Economics Department Working Paper 788, July 2010.

⁹ ECB Press Release, Monetary Policy Decisions, October 8, 2008.

¹⁰ Van Rixtel, Adrian, and Gabrielle Gasparini, Financial Crises and Bank Funding: Recent Experience in the Euro Area, BIS Working Paper 406, March 2013, pp. 10 ff.

was largely sterilized.¹¹ There was also a flight to quality within the euro zone, which manifested itself initially in a decline in sovereign bond yields for Germany and other countries perceived as safe havens, and eventually resulted in lower interest rates for many financial instruments in these countries. Interest rates on German public debt and bank debt securities began declining in early 2011 and those on German corporate bonds fell from the end of that year (Figure 1).

7. In mid-2014, the ECB lowered the interest rate on its deposit facility below zero amid growing concerns about deflationary pressures. Later in the year, it began to purchase covered bonds and asset-backed securities, and in early 2015, it initiated a program to purchase public sector bonds. The intention is to inject a total of EUR 60 billion per month of liquidity into the system until inflationary expectations are more in line with policy objectives. Reflecting these developments, the yield on sovereign bonds has fallen to negative rates in several countries.¹² Several short-term interest rates have also fallen below zero, including for benchmarks that are used for pricing of important products such as mortgage loans.



8. Regulatory changes in the wake of the global financial crisis are also affecting bank funding conditions. The Liquidity Coverage Ratio (LCR), adopted as part of the European Union's implementation of Basel III, requires that banks hold a sufficient amount of highly liquid assets to

¹¹ The ECB launched its first covered bond purchase program in 2009 and a second in 2011. A more general securities market purchase program was initiated in 2010. Purchases under the covered bond programs were not sterilized.

¹² The impact in Germany has been particularly marked. The yield on every German benchmark bond with maturities up to six years is already negative, and the 10-year bond yield fell to 0.075 percent in April 2015; the current 10-year yield is about 0.5 percent.

cover net liquidity outflows over a 30-day period under a stressed scenario. The LCR is intended to reduce the liquidity shortages that led to major problems in the short-term capital markets during the global crisis, and will likely raise the buy-and-hold demand for such assets as an alternative to providing short-term funding for other banks. Application of the requirement is being gradually phased in over time from 60 percent coverage in 2015 to full coverage in 2018. The anticipation of the introduction of the Leverage Ratio (LR) and the Net Stable Funding Ratio (NSFR) is also affecting the willingness of banks to hold certain kinds of assets.

9. These developments, along with the fundamental shifts in financial markets stemming from the euro and global financial crises, pose special challenges for bank funding practices.

Some short-term sources of wholesale finance (e.g., U.S. money market funds) are already much less available than previously, and others (e.g., repurchase markets) will be severely tested in an environment of negative interest rates. Longer-term capital markets are clearly much more fragile than earlier, and the ability of banks to obtain unsecured financing on these markets is constrained. Markets for covered bonds and other sources of secured financing are also less deep than before the crises. Although the immediate impact on bank funding of these developments has been offset by the provision of abundant liquidity through central bank operations, the underlying market structures have been weakened and the system is less resilient than before. Close monitoring of financial markets will be necessary when monetary policy eventually moves to less reliance on quantitative easing. The high level of deposit funding of the German banking system eases the process of adjustment to these changes.

STRUCTURE OF THE BANKING SYSTEM

10. The German banking system has continued to consolidate since the global financial crisis began, bringing the decline in number of institutions to more than 60 percent since 1990. Consolidation during the crisis has been driven mainly by financial difficulties and, in contrast to previous years, has involved a number of larger institutions. Banks in both the public and private sectors have been affected. However, there has continued to be little consolidation across the banking pillars, partly because of the inability of private sector investors to acquire shares in public sector institutions.

11. The first pillar of the banking system, the private commercial bank sector, is dominated by three large banking groups: Deutsche Bank (including its subsidiary Deutsche Postbank), Commerzbank, and HypoVereinsbank (a wholly-owned subsidiary of the UniCredit Bank Group of Italy).¹³ The operations of these banks are international in scope and cover the full range of retail, corporate and investment banking, including deposit services, transaction banking, corporate finance, origination of debt and equity, derivatives and fund management. There are also 160 private commercial banks and other smaller commercial banks offering specific business

¹³ Deutsche Bank owned 93.7 percent of outstanding shares of Deutsche Postbank as of end-2014. Deutsche Bank announced in April 2015 that it intends to reduce its Postbank holdings to less than 50 percent of outstanding shares.

services (mainly mortgage loans) on a regional basis or focused on financing specific industries or on provision of wealth management facilities. Finally, over 100 foreign banks have local branches, many of which have limited operations.

12. Borrowing on the interbank market and deposits by money market funds are important sources of funding for the larger commercial banks, which also are the largest borrowers in the repurchase market. About 10 percent of their funding is obtained on longer-term capital markets through issuance of covered bonds (Pfandbriefe) and other debt securities. Customer deposits account for less than half of their total financing requirements. By contrast, regional and smaller private commercial banks obtain the bulk of their funding from customer deposits. Local branches of foreign banks are funded by both customer deposits and intercompany deposits from their head offices abroad.

13. Most public sector banks (the second pillar of the banking system) are regional savings banks (Sparkassen), which are incorporated as institutions under public law and are mandated to support economic development within their region. Savings banks have no shareholders but instead are supported by a responsible public body, normally the respective local authority (city, town or district) or a special municipal association established for that purpose. They are primarily not profit-maximizing entities, and support the economic development in the city, town or district by offering a wide range of financial services. Savings banks are authorized to operate branches only within their local region, and their main clients are retail customers and small- and medium-sized businesses. Public sector banks also include Dekabank and six regional Landesbanken. Dekabank is wholly owned by the savings banks and serves as their central asset manager, providing asset management services for the savings banks, the Landesbanken and their customers. Landesbanken are owned mainly by state governments and regional savings banks in varying proportions. They provide clearing services and liquidity funding, as well as a range of wholesale banking services, for the savings banks, and are the main banks of the regional state governments and municipalities in their region, though some have a presence in other areas as well. Landesbanken also provide mortgage and corporate loans and offer other commercial and investment banking services.

14. Customer deposits account for the bulk of funding for the regional savings banks. Many savings banks have a significant surplus of deposits over their outstanding customer loan book; the average loan-to-deposit ratio is about 90 percent. By contrast, the six regional Landesbanken obtain only about a third of their funding from customer deposits, and instead rely on interbank borrowing (a significant share of which is from the savings banks) and the capital markets, including the public and mortgage covered bond markets. Landesbanken, including their private law subsidiaries, accounted for nearly 40 percent of total outstanding covered bonds at the end of 2014 and were also active borrowers on the repurchase market.

15. Cooperative banks or credit cooperatives (Volksbanken and Raiffeisenbanken), the third pillar of the banking system, account for the largest number of banking institutions in Germany (more than 1,000 individual entities at end-September 2015). They generally operate on a local or regional basis (though they are not required to do so) and are owned by their

members, which are also their main depositors and borrowers. They focus on providing banking services to support the business requirements of their members. They also make such services available to the general public within their region. Two regional central institutions are owned by the cooperative banks. The largest is Deutsche Zentral-Genossenschaftsbank (DZ Bank), which is the central institution for some 850 credit cooperatives located across most regions of Germany. Westdeutsche Genossenschafts-Zentralbank (WGZ Bank) is the central institution for about 180 credit cooperatives located in the Rhineland and Westphalia. These two institutions provide asset management, clearing services and liquidity funding for the credit cooperatives within their region, and also offer mortgage and corporate loans and other banking services.¹⁴

16. Cooperative banks fund themselves mainly through customer deposits, often generating a surplus of deposits over their outstanding loans; the overall loan-to-deposit ratio of such banks is just over 90 percent. The regional central institutions, by contrast, are funded mainly by interbank deposits (a significant share of which is provided by their owners, the cooperative banks) and also borrow on the capital markets.

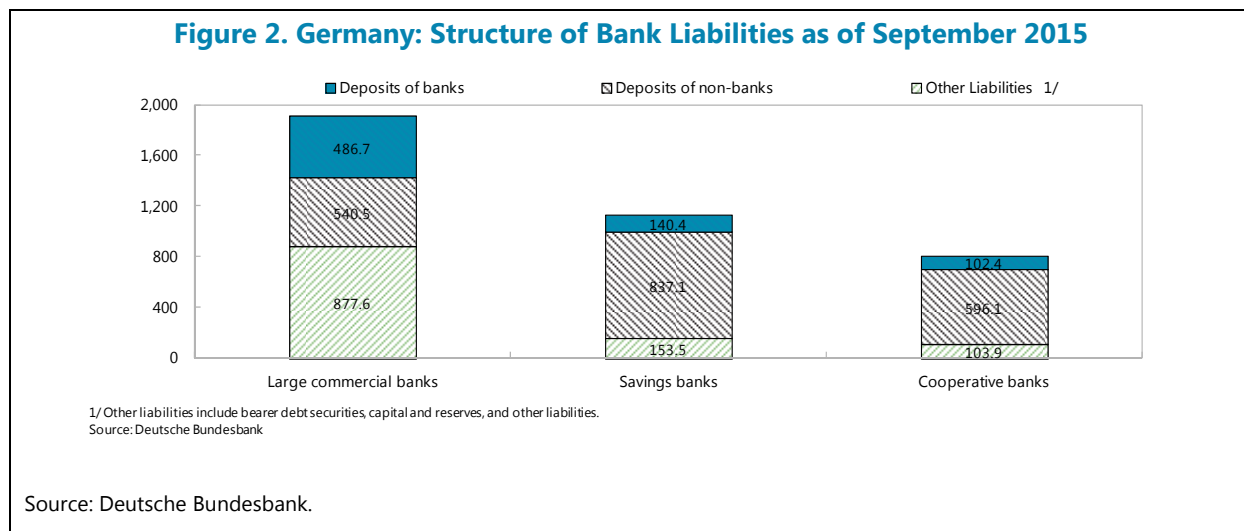
17. The mortgage finance institutions include 16 mortgage banks (Hypothekenbanken), some of which are subsidiaries of private commercial banks or public sector banks, and 21 building and loan associations (Bausparkassen). The mortgage banks typically specialize in public sector and commercial property lending, and also offer retail mortgage loans. They fund themselves mainly through issuance of covered bonds and by borrowing on the repurchase market. The building and loan associations concentrate on retail mortgage lending, and are funded mainly through deposits on savings and loan contracts.

18. Finally, there are 19 special purpose banks, which include development banks and other banks assigned specific responsibilities. Development banks are publicly owned, are guaranteed by the regional or central government, and have a public policy mandate. They fund themselves mainly through the capital markets at low interest rates due to the public guarantees. The largest such bank is Kreditanstalt für Wiederaufbau (KfW), which is jointly owned by the federal government and the states, and specializes in housing and SME loans and in export and import finance. Banks assigned specific responsibilities operate in both the public and private sectors, both nationally and regionally, and typically focus on loans to medium-sized industries. They also fund themselves mainly through the capital markets.

19. Funding sources thus vary considerably among the different types of institutions, including for banks within the same pillar (Figure 2). Some institutions (e.g., savings banks, cooperative banks, building, and loan associations) are funded mainly by customer deposits and generate a surplus of funds over their own needs. Others (e.g., large private commercial banks, Landesbanken, and mortgage banks) obtain significant amounts of funding from the capital markets. Funding from short-term interbank and money markets and from repurchase markets is

¹⁴ DZ Bank and WGZ Bank have recently announced their intention to merge, with a target for completion by end 2016.

important for these institutions. Longer-term capital markets, including the covered bond market, are also key funding sources.



POTENTIAL FINANCIAL STABILITY ISSUES IN BANK FUNDING

20. The legacy of the financial crises has been a shift in the availability, form and cost of funding for German banks. This section summarizes the main changes in short-term and long-term bank funding markets, both unsecured and secured. Short-term unsecured funding from both U.S. and euro money market funds has fallen steadily in recent years and is now a fraction of former levels. Repurchase markets, the main source of short-term secured financing, have also contracted significantly at the same time that haircuts and costs have risen. Longer-term debt markets, even for collateralized instruments such as covered bonds, have become more domestically focused, potential issuance sizes are smaller, maturities are shorter, and the depth of markets is constrained by the absence of robust secondary market trading. Bank balance sheets are about 10 percent smaller than at their peak, and financing has shifted to more reliance on non-bank deposits. Some of these changes are intended consequences of regulatory reforms following the global crisis, which are aimed at promoting a more stable financial system.

21. For the past several years, the system has also had to cope with a low interest rate environment and a flat yield curve, which have exacerbated long-standing problems of low bank profitability. More recently, as ECB policy rates and German sovereign benchmark bond yields have become negative, some financial markets have been placed under increased stress.¹⁵ Benchmark bond yields and those on other liquid longer-term instruments will come under

¹⁵ In addition to the stresses on funding markets, negative interest rates also pose special challenges for derivative markets, as most mathematical models used for pricing derivatives do not allow for negative rates.

additional pressure from the ECB's quantitative easing program. The system will also have to adjust to the new LCR, leverage, and NSFR regulatory reforms, which will pose special issues for liquid short-term and long-term financial instruments. Although consolidation of institutions and adaptation of business models have added resilience to the system since the crisis began, significant additional challenges are posed by developments in some funding markets.

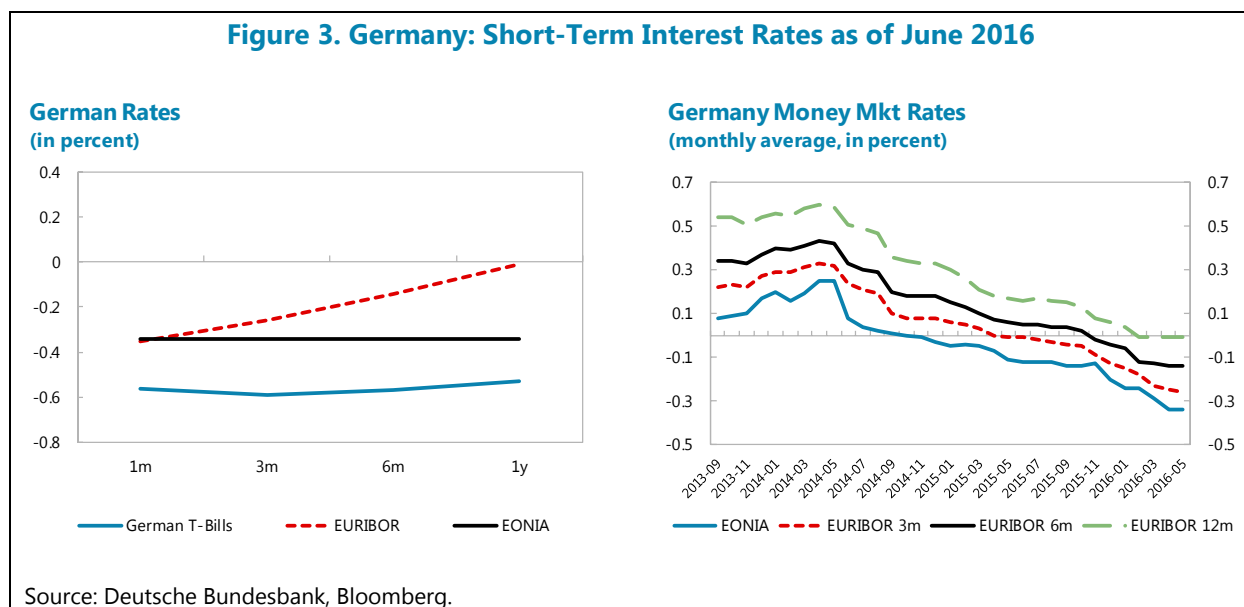
Short-term money markets

22. The short-term money market is where assets and liabilities of the financial market with maturities of less than one year are traded.¹⁶ The market provides bank funding mainly through the short-term interbank market (both unsecured and secured) and through investments in bank deposits or other instruments by money market mutual funds. Traditionally, transactions on the interbank market were an efficient way for banks to optimize their liquidity needs without involving the central bank, whose interventions in the market were associated with monetary policy actions. The severe market segmentation that occurred with the onset of the global financial crisis in Europe resulted in a drop in interbank funding from about 30 percent to only about one fifth of overall financing of German banks, as well as a shift to less stable overnight maturities. This shift also occurred in most other European markets, and the situation resulted in the need for provision of large amounts of liquidity to the interbank market by the ECB, which is now an important liquidity intermediary.

23. The main challenges affecting the short-term money markets stem from the low interest rate environment, which has reduced their attractiveness to potential investors and lowered the flow of funds to the sector. These effects are likely to be exacerbated as the system continues to adjust to the move to negative ECB policy rates. Given the current macroeconomic situation, it seems that the preconditions for a return to higher interest rates will not exist for quite some time.

24. The cuts in the ECB policy rate in mid- and late-2014 have been reflected in lower money market interest rates. EURIBOR rates, which have fallen steadily across all maturities since the euro crisis began, became negative for tenors below six months, nearing zero for six-month funds and falling below 0.15 percent for one-year maturities (Figure 3). The latter rates are often benchmarks for pricing a range of bank products, including many mortgage loans. Because it is difficult for banks to adjust deposit rates to offset the decline, an extended period of low rates would lead to an erosion of margins on a number of bank lending operations. Moreover, the longer low rates persist, the more they become embedded on the asset side of the balance sheet and the more difficult the eventual adjustment will be.

¹⁶ The short-term money market trades negotiable certificates of deposit, bankers acceptances, commercial paper, repurchase agreements, Treasury bills and other short-term instruments.

Figure 3. Germany: Short-Term Interest Rates as of June 2016

Short-term unsecured markets

25. Negative interest rates have a strong impact on short-term money markets. These markets have traditionally been used to hold temporary cash balances of corporate treasurers and others, and are an important mechanism for moving liquidity around the financial system. Because cash implicitly carries an interest rate of zero (other than storage and security costs), a negative interest rate creates a strong incentive to hold cash or other assets rather than bank deposits, thus reducing the flow of funds to short-term markets and making it more difficult to satisfy temporary liquidity needs. Low or negative interest rates may also encourage disintermediation of the banking system by large corporates with important cash holdings. There is anecdotal evidence that a number of such market participants are setting up their own investment entities outside the normal banking system.

26. Partly as a result of the lower interest rates, but also due to changing risk perceptions, investments in the European market by money market funds have fallen significantly. Assets managed by money market funds world-wide at end-June 2015 amounted to EUR 4.1 trillion, little changed from assets under management at the outset of the global financial crisis.¹⁷ U.S. funds continued to account for about 60 percent of the market, but the share of their assets invested in Europe, and specifically in European banks, has declined sharply. In particular, the exposure of U.S. money market funds to German banks at end-September 2015 was only about EUR 40 billion, about a third of earlier levels.¹⁸ Prime U.S. money market funds are now allocating only about 3.5 percent

¹⁷ European Fund and Asset Management Association (EFAMA), International Statistical Release, September 2015.

¹⁸ U.S. Securities and Exchange Commission, Division of Investment Management, Money Market Fund Statistics, September 2015.

of their portfolio to German banks, compared to about 10 percent at end-2006.¹⁹ Continued low interest rates, along with recent U.S. regulatory changes requiring variable net asset value reporting, liquidity fees and redemption limits, may lead to further reductions in their European exposure. Although the reduced reliance on such financing is positive in that it removes a source of volatility from the balance sheet, banks must nevertheless find alternative funding sources.

27. Assets managed by European money market funds increased during the global financial crisis, but have declined since the euro crisis began. Total assets managed by European money market funds fell by about 25 percent from end-2009 to end-2014.²⁰ Such funds are domiciled mainly in France, Ireland and Luxemburg. Nearly half of the assets of European money market funds are denominated in currencies other than the euro, presumably to enable access to higher rates of return in the USD and GBP markets.²¹ The outstanding balance of German money market funds at end-2014 was nearly 90 percent below the level prior to the crisis.

28. Although several sources of short-term financing are weaker than in the past, and short-term markets in general are under stress from low and negative interest rates, access by banks to short-term funding has not been impaired. ECB operations, including quantitative easing, have replaced short-term market liquidity previously provided from other sources. ECB operations led to an increase in excess liquidity in the banking system from a low of just over EUR 100 billion in November 2014 to more than EUR 500 billion in September 2015.

Short-term secured (repurchase) markets

29. The declining participation of banks in the European repurchase market has been a feature of the financial crisis, mainly reflecting the impact of concerns about counterparty risk as well as higher demand for precautionary cash balances. The size of the European repo market peaked at EUR 6.8 trillion in June 2007, and fell by nearly one third to EUR 4.3 trillion in December 2008.²² The market recovered to reach its previous peak in June 2010, but was then affected by the re-intensification of the crisis in Europe and stood at EUR 5.5 trillion at end-December 2014. Repo funding by German banks followed a similar pattern, falling with the outbreak of the global financial crisis and then recovering until the euro crisis hit in mid-2010. Subsequently, repo funding by German banks has fallen off dramatically. Outstanding liabilities of all German banks from repurchase agreements at end-2014 were only about half their level of June 2010. The fall was particularly marked for the Landesbanken and mortgage finance institutions. Haircuts and costs of repurchase operations have also increased.

30. Repurchase markets are normally used by banks and other investors to obtain short-term financing for their portfolios. Pricing in the repurchase markets is driven by supply and

¹⁹ Fitch Ratings, U.S. Money Market Funds Quarterly, various issues.

²⁰ ECB Statistical Data Warehouse, Aggregated Balance Sheet of Euro-Area Money Market Funds.

²¹ Mai, Heike, Money Market Funds—An Economic Perspective, Deutsche Bank Research Paper, February 26, 2015.

²² International Capital Market Association (ICMA), European Repo Market Survey, various issues.

demand for cash and is defined in terms of the cost of borrowing against general collateral (i.e., the range of high quality liquid assets accepted by most intermediaries at approximately the same repo rate). As interest rates approach zero, pricing in repurchase markets becomes more difficult because of the possibility that rates on special collateral (i.e., an asset subject to exceptional demand compared with other similar assets) can become negative. Repurchase markets are subject to the same inhibiting influences as short-term money markets in a negative interest rate environment. Indeed, the most common source of funding for repurchase contracts has traditionally been short-term investments by money market funds, so their reduced attractiveness would have a direct impact on the liquidity of repurchase markets.

31. The repurchase market is likely to remain weak as long as negative rates persist. Recent and prospective regulatory changes may also adversely affect liquidity in this market. Because repurchase agreements typically are short-term, often with less than 30-day maturity, they require larger liquidity buffers and more capital. The combined impact of these influences is less availability of short-term funding for trading portfolios of banks and other financial intermediaries, which in turn, though partly an intended consequence of the reforms, is likely to lead to a further weakening of secondary markets for longer-term capital market instruments. Less liquidity in the secondary market will ultimately be reflected in more volatility, higher costs and less capacity for primary issuance for debt markets in general. Thinner short-term and long-term markets make the financial system more vulnerable to future shocks, and make potential funding runs more difficult to manage.

32. Additional issues can arise in the repurchase market in an environment of negative interest rates. Standard repurchase contracts are drafted on the implicit assumption that interest rates will be positive, and do not include a mechanism for calculating a (reverse) payment obligation in relation to a negative interest charge or for requiring payment by the lender to the counterparty of the absolute value of the negative interest amount.²³ Moreover, contracts normally provide that the repurchase rate will be used as the interest rate on any cash margins. In the event of early termination of a contract or in cases when there has been a coupon payment, dividend or other income, the standard contract also stipulates that any resulting payments will be calculated on the assumption that they are reinvested at the repurchase rate on the transaction. These situations are not consistent with the implicit zero interest rate applicable to cash, potentially giving rise to perverse incentives to the lender to fail to deliver on his contractual obligations, thus creating a loss for the borrower despite the failure having been caused by the lender. Banks have thus far addressed these issues on an ad hoc case-by-case basis, so that transactions continue to take place, but at the cost of delays and administrative burdens that make the market less functional, and a modification to the standard contracts will eventually be necessary if negative rates persist.

Bank securities markets

²³ The standard repurchase contract is the Global Master Repurchase Agreement (GMRA), published by the International Capital Market Association. An optional supplementary condition in the 2011 version of the GMRA would set the repo rate to zero in the event of a failure to deliver, and would give the buyer the right to terminate a failed transaction at any time.

33. The key longer-term markets for bank securities (bonds with maturities above one year) have also declined. Bundesbank data show that outstanding bank bearer debt (including senior debt, subordinated debt and covered bonds) declined by more than one fourth from mid-2010 to end-2014. Most of the decline was attributable to the Landesbanken and the mortgage banks, where the outstanding amounts fell by 40 percent and over 60 percent, respectively, reflecting mainly the fall in outstanding covered bonds financing loans to the public sector.²⁴ Unsecured debt outstanding of German banks remained fairly stable during the initial phases of the global crisis, but began to decline in mid-2010 with the onset of the euro financial crisis. Subsequently, unsecured debt fell by about 15 percent through end-2014, reflecting the impact of deleveraging in reducing absolute financing needs, the growing reliance on deposits as a source of funding, and the availability of attractive alternative financing from ECB liquidity facilities. More recently, the amount of unsecured bank debt has stabilized, as banks adapt their funding strategies to focus on raising additional senior financing to meet bail-inable capital needs.

34. Banks are likely to need to raise more senior unsecured funding from the public markets than in the past owing to regulatory changes. The unsecured private placements previously used by the Landesbanken for funding from the savings banks and by the central institutions for funding from the cooperative banks are not considered liquid for purposes of the LCR and are likely to decline. Similarly, short-term borrowing for financing of trading positions or longer maturity assets will be penalized in NSFR calculations and banks may have to choose between obtaining longer-term financing or reducing their underwriting and trading businesses.²⁵ The resulting decline in market liquidity, along with the crowding effect of the simultaneous need for many banks to increase bail-inable capital to comply with the EU Bank Recovery and Resolution Directive, could pose a challenge for banks seeking additional longer-term unsecured financing.

35. Covered bonds comprise the second largest bond market in Germany, exceeded only by government bonds. They are used mainly to finance loans to the public sector or for property, with niche businesses in shipping and aircraft finance.²⁶ The total outstanding balance of such bonds has declined significantly in recent years, falling from nearly EUR 1 trillion in 2006 to EUR 402 billion at the end of 2014.²⁷ The drop reflects mainly a fall in bonds financing loans to the public sector. Reduced public sector borrowing in general, increased direct access to the capital markets by local authorities, and lower Landesbanken issuance of public sector covered bonds following the elimination of government guarantees were all factors that contributed to the change. There was also less arbitrage in such transactions after the exclusion of higher-spread sovereign bonds once

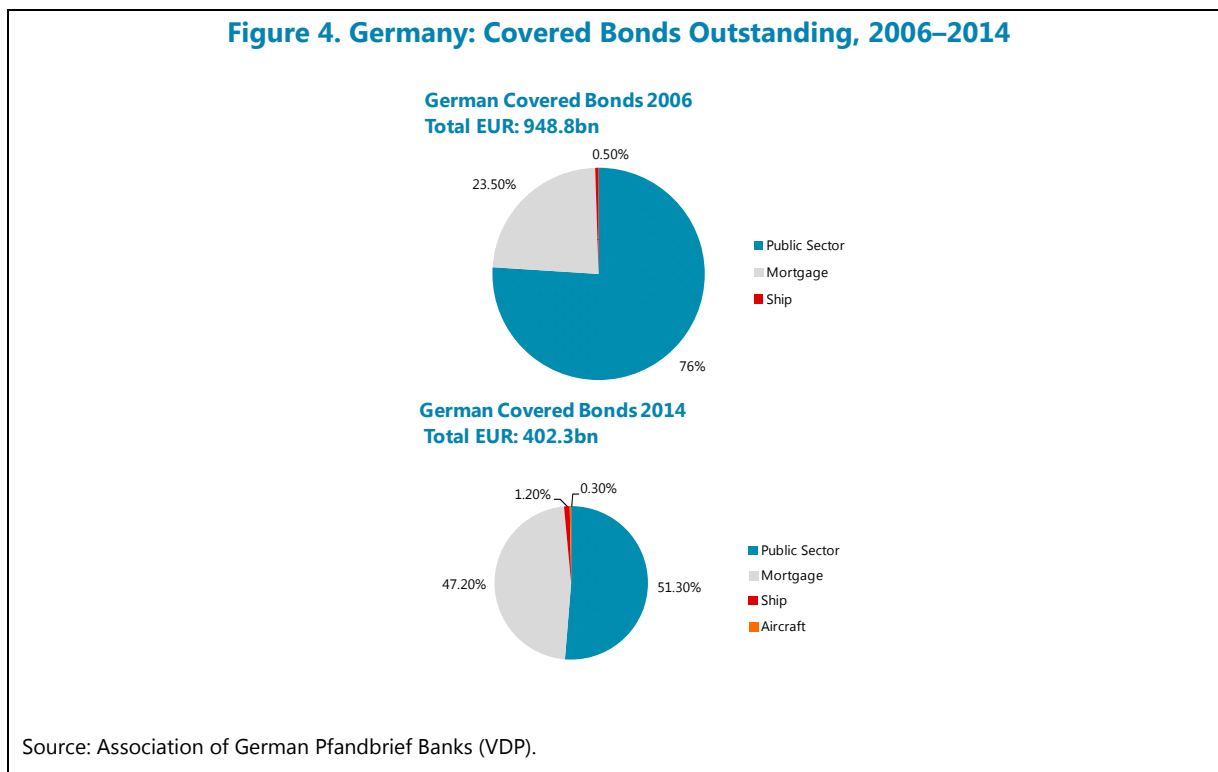
²⁴ The decline was due to both the abolition of state guarantees for such bonds from 2001 and the removal of debt of countries under financial stress from cover pools following the euro crisis. Werner, Ralf and Manuela Spangler, *Germany Covered Bonds: Overview and Risk Analysis of Pfandbriefe*, Springer Briefs in Finance, 2013, p. 26.

²⁵ One large European bank has recently announced that it intends to relinquish its primary dealerships and cease making markets for all European government bonds owing to stricter regulatory requirements and a slump in trading income due to low interest rates.

²⁶ There is some discussion of the possibility of including long-term export finance and infrastructure loans as eligible assets for covered bond pools.

²⁷ Verband Deutscher Pfandbriefbanken—VDP (Association of German Pfandbrief Banks), Pfandbrief market statistics.

the euro crisis began. More recently, ECB liquidity operations have provided cheaper funding alternatives for some potential issuers. Covered bonds financing property loans also declined, but by smaller amounts, and the share of such bonds rose from about a quarter to nearly half of the total outstanding balance over the same period (Figure 4).



36. Covered bonds are an important source of finance for a large number of German financial institutions; nearly 80 issuers have bonds outstanding.²⁸ They are a particularly important source of finance for private mortgage banks, but also provide significant amounts of funding for public mortgage banks and the Landesbanken. Some licensed institutions issue only small amounts of bonds to keep their program active and preserve the ability to access markets in the future in case of need. Because most covered bonds are issued with an average maturity of five to eight years, and the maturity of the underlying loans is generally much longer (20–30 years with interest reset periods of 10 years or less), covered bonds involve an inherent refinancing risk.

37. Refinancing risk is particularly important because of the thin liquidity of the secondary market for covered bonds since the global financial crisis. Although covered bonds have declined to only about 5 percent of total banking system liabilities, compared with 15 percent prior to the crisis, the risk is highly concentrated within the mortgage banks. Covered bonds account for almost half of funding for such banks, many of which have limited alternative sources of finance. Covered bonds have traditionally been favored by buy-and-hold investors, and trading volumes are normally not high, making the sector more sensitive to sudden changes in sentiment. Spreads have

²⁸ European Covered Bond Council, ECBC Covered Bond Comparative Database.

generally remained low in recent years, but absorptive capacity is also lower, and the combined issuance of jumbo and benchmark covered bonds (issues with face value greater than EUR 1 billion and EUR 500 million, respectively) has fallen by more than 60 percent from pre-crisis levels. Many covered bond investors are from Germany or neighboring countries and may have few practical investment alternatives in today's environment, but the precedent of the disappearance of buyers in the initial stages of the global financial crisis provides clear evidence that refinancing risk can materialize, even for covered bonds, when broader financial markets come under stress.

38. Recent decisions regarding the implementation of Basel III in the EU provide for a more favorable treatment of the most liquid covered bonds in the calculation of the LCR.

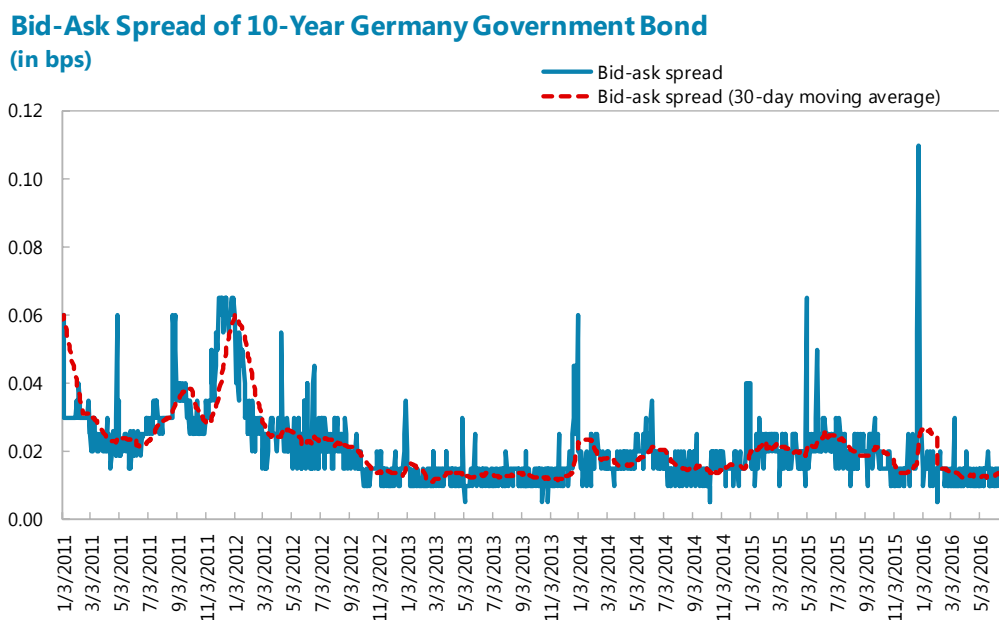
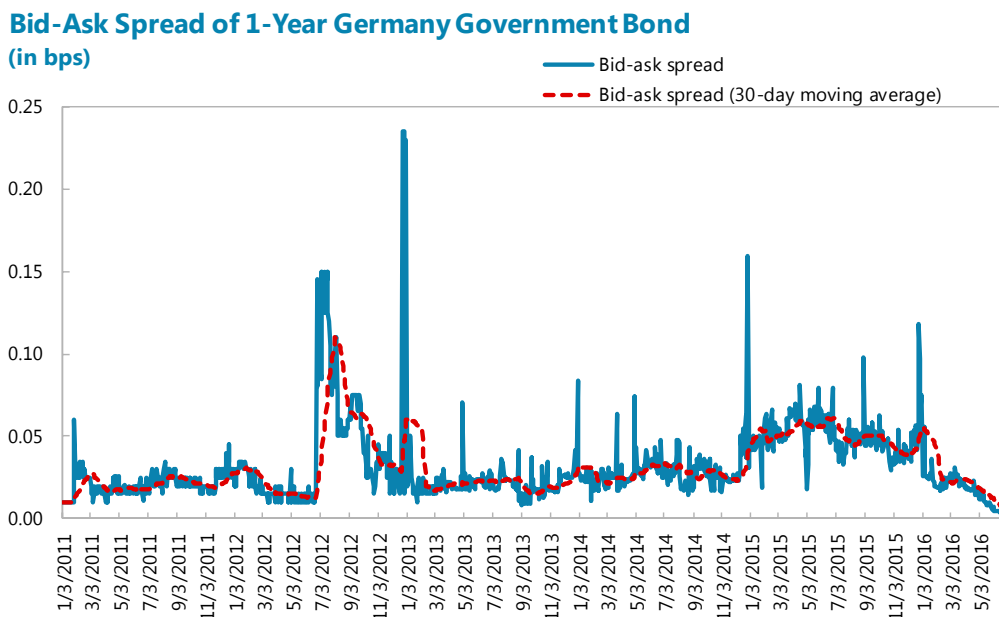
Specifically, such bonds may be classified as Level 1 HQLA up to a ceiling of 70 percent of their value, but with a haircut of 7 percent. Although demand for covered bonds by bank investors should in principle be supported by this decision, the experience of the global crisis indicates that liquidity for the bonds can sometimes be less than expected. Moreover, in the wake of the crisis, the ability and willingness of financial intermediaries to support secondary market liquidity is much reduced and is dependent on the health of other financial markets.²⁹ Going forward, the treatment of covered bonds under the NSFR could also have an impact on the willingness of bank investors to hold the bonds.

39. The liquidity of high quality unsecured and secured bond markets appears to be lower in the aftermath of the global and euro financial crises.

Although German government bonds continue to be highly liquid, the depth of liquidity seems to have deteriorated somewhat in late 2015; there has been a gradual increase in the bid-ask spread and spreads have shown some temporary widening during times of market stress (Figure 5). The willingness of financial intermediaries to provide balance sheet for market making activities as well as the ability of these institutions to hold proprietary trading positions is much less, partly as an intended consequence of regulatory change as well as the erosion of the repurchase market.

²⁹ The Danish covered bond market is reportedly experiencing a decline in liquidity in the secondary market owing to the impact of both the LCR and negative interest rates on local repurchase markets, which are the traditional source of finance for market makers for the bonds.

Figure 5. Germany: Spreads of German Government Bonds as of June 2016



Source: Bloomberg

40. More recently, the liquidity of markets for some bonds has been reduced as a result of the ECB’s quantitative easing program, as discussed in the April 2015 GFSR. ECB guidelines allow it to purchase up to 33 percent of sovereign bond issues and as much as 70 percent of eligible

covered bonds.³⁰ Market sources estimate that ECB purchases of sovereign bonds (all on the secondary market) have regularly been near the limit for some countries. The ECB has also often taken up to 50 percent (and occasionally more) of eligible covered bond issues in the primary market and then has added further in secondary markets to reach holdings near the limit for some bonds. This has reduced potential trading volumes for these bonds and has therefore made price discovery more difficult. At the same time, the overall level of systemic liquidity has been dramatically increased by ECB operations.

Interconnectedness

41. The current structure of the banking system involves significant interlinkages within the pillars. The Landesbanken derive about 20 percent of their funding from the regional savings banks, which are thus exposed to Landesbanken credit risk on the asset side. In addition, the savings banks are generally the major shareholders of the Landesbanken and have considerable subordinated capital at risk in the event of losses or insolvency. The central cooperative banks (DZ Bank, the fourth largest bank in the country, and WGZ Bank) depend for an even larger share of their funding (about 60 percent) on their shareholder cooperative banks, which are in a position analogous to that of the savings banks. The role of the Landesbanken and central cooperative banks in reallocating liquidity among institutions makes them key nodes of interconnectedness within their respective banking pillars. At the same time, the large commercial banks obtain significant amounts of interbank funding from the smaller banks, thereby exposing the latter to credit risk.

42. Interconnectedness is heightened by the mutualized cross-institutional guarantees within each of the pillars. The objective of these schemes is to provide mutual support to protect the member institutions from insolvency and liquidation, which means that client deposits would be protected but also that a broad range of institutions can be affected by the failure of one of the members. The guarantee system of the savings banks is organized on a regional (e.g., the guarantee funds of the regional savings bank associations) or functional basis (e.g., the guarantee fund of the publicly owned building and loan associations). In a crisis situation, a multi-tiered liability scheme regulates financial support, including additional contributions by the savings banks, and depositors are ultimately protected by the national deposit insurance scheme.³¹

43. A similar guarantee structure contributes to high interconnectedness within the cooperative bank sector. An institutional protection scheme funded by the banks is operated by the National Association of German Cooperative Banks, which has important enforcement powers to safeguard the solvability of member institutions. In a crisis, the members can be required to provide additional support to the institutional protection scheme recognized as deposit guarantee scheme,

³⁰ In the case of sovereign bonds there is an additional limit of 33 percent of an issuer's outstanding securities, after consolidating holdings in all of the portfolios of the national central banks. For covered bonds, the 70 percent issue share limit is also applied after consolidating holdings in all of the portfolios of national central banks.

³¹ The adequacy of the existing guarantee funds in the event of insolvency of one of the Landesbanken is assessed in the FSAP Technical Note on "Crisis Preparedness, Bank Resolution and Crisis Management Frameworks."

if the financial means are inadequate for the deposit protection function of the institutional protection scheme.

44. The mutualized guarantee of the commercial banks operates somewhat differently in that it is a direct guarantee of deposits not covered by the statutory deposit protection scheme. The amount of the guarantee is limited to 20 percent of the equity capital of a participating institution (down from 30 percent before 2015); the guarantee will be further reduced to 15 percent of equity capital in 2020 and 8.75 percent of equity capital in 2025.³²

45. Because the system is fragmented by the banking pillars, there are relatively few linkages across the banking pillars to other parts of the financial system. The commercial banks rely to an important extent on capital markets instruments, many of which are placed with investors in other banks, including the savings banks and cooperative banks. The fact that much cross-pillar investment is channeled through the Landesbanken and central credit cooperative institutions concentrates these linkages; these central institutions are important nodes of interconnectedness. At the same time, the savings banks and cooperative banks are experiencing increased competitive pressures from the commercial banks in the retail and SME sectors, where they have traditionally been dominant. Several foreign commercial banks with retail-focused business models are also competing in those sectors.

46. Other linkages stem from interconnections among financial instruments. For example, a broad range of banks, insurance companies and pension funds are investors in money market funds, which have traditionally been major lenders in the repurchase market. Repurchase contracts in turn are an important source of finance for financial intermediaries in long-term capital market instruments such as covered bonds. A drop in money market fund holdings by banks or insurance companies can thus impair the liquidity of the longer-term bond market and lead to difficulties for mortgage finance institutions and others that rely on that market for funding. Other interconnections stem from derivative transactions (other than those channeled through CCPs), which generally involve one or more of the large commercial banks, as the smaller institutions do not make markets in these instruments.

47. The covered bond market is a source of both domestic and international interconnectedness. Covered bonds are major investments in the portfolios of many German banks, insurers and financial intermediaries. They also finance significant amounts of cross border exposure to certain non-German markets. In addition, more than one fifth of the investor base for German covered bonds is comprised of foreign institutions.

POLICY RECOMMENDATIONS

48. Prompt action by the authorities and the injection of substantial government resources stabilized the German banking system in the initial stages of the global financial

³² Bundesverband Deutscher Banken (Association of German Banks), The Deposit Protection Scheme.

crisis. ECB monetary operations and interest rate policy continued to provide necessary support as the euro financial crisis evolved. Nevertheless, many funding markets remain fragile and there are potential side effects of the supporting measures that need to be taken into account in policy formulation going forward.

49. Measures to improve the functioning of interbank markets should be considered.

Though ECB injections are currently ensuring a high level of liquidity in the system, these operations will not continue indefinitely, even if they are extended beyond the current horizon of September 2016. Measures to facilitate the transfer of excess liquidity within and across the banking pillars could help ensure that excess savings can be intermediated efficiently once the ECB is no longer performing that function. Elimination of barriers to competition and consolidation among banks, particularly within the savings banks and credit cooperatives (e.g., by relaxing the regional principle to allow economically justified changes or by encouraging more participation by finance professionals in management boards), could help promote this objective. The encouragement of direct financing linkages between banks across pillars (e.g., by developing co-lending arrangements involving Landesbanken and some of the larger savings banks) could also be useful to broaden the channels for cross-pillar financing.

50. The authorities should monitor the repurchase market closely and be prepared to consider providing support if private sector flows are inadequate, secondary markets dry up and volatility becomes excessive. A liquid repurchase market is critical to the health of the broader financial system, providing a source of short-term funding for banks and other investors and underpinning lower volatility and more efficient pricing in the longer-term bond markets. If support is necessary, it could take the form of the provision (presumably through the ECB) of a temporary alternative source of liquidity and/or securities to dampen price swings. A liquidity backstop for the system is already in place through the ECB, and the Bundesbank makes securities acquired under the ECB's Public Sector Purchase Program (PSPP) available for securities lending.³³ These programs provide an institutional framework that could be adapted in collaboration with the ECB to a broader range of collateral and pricing in the event of need. Although it is too early to consider recalibration of recent international regulatory measures that may be adversely affecting repurchase market liquidity, the impact of these measures on bank funding and broader financial markets will need to be monitored carefully to ensure that the reduction in liquidity does not have unduly negative externalities not intended by the reforms. Given the importance of Germany as a global financial center, the impact of reforms on German financial markets is an important consideration that can help inform global policy dialog on their implementation.

51. Measures should be explored to improve the efficiency of the senior unsecured long-term bank debt market. Steps to promote robust secondary trading will underpin investor confidence and thereby ensure efficient pricing and adequate absorptive capacity. The measures outlined above to support a liquid repurchase market should be part of this strategy, along with identification and review of other factors, including in particular possible regulatory issues that may

³³ Deutsche Bundesbank, PSPP Securities Lending, Press release, October 2, 2015.

inhibit the participation of financial intermediaries in the secondary market. More generally, steps to allow increased private investment over time in a broader range of financial institutions could contribute to a stronger overall banking system.

52. Covered bonds will also benefit from improvements in the efficiency of broader long-term debt markets, including in particular steps to promote active secondary markets and ensure their liquidity. Such steps are of special importance in light of the allowed inclusion of a large proportion of the most liquid covered bonds as HQLA assets for purposes of calculation of the LCR. In addition, the authorities may wish to monitor the impact of the introduction of the NSFR, and if necessary, consider macro-prudential or other measures that could reduce the refinancing risk inherent in the financing of long-term loan assets with medium-term covered bonds.

53. The implementation of the LCR in the EU and the prospective adoption of the leverage ratio and NSFR are likely to require adjustment of financial portfolios, with further effects on bank funding practices. It will be important that the adjustment is managed so as to limit the impact on market conditions during the transition phase. This implies the need for close ongoing monitoring of bank funding conditions and the adoption of appropriate policy responses to ensure market liquidity and the smooth functioning of the system going forward. Ultimately, action to mitigate the transitional costs of monetary easing and regulatory reforms on essential and desirable market functionality will contribute to the successful implementation of these policies.

54. The authorities should follow up on the recent survey on interest rate sensitivity of bank balance sheets. Financial institutions should be encouraged to indicate how they will manage the risks to their profitability and funding prospects that would be posed by a further reduction in interest rates and/or flattening of the yield curve. Similarly, the transition to higher interest rates once the process of normalization of rates begins will also involve significant challenges. Those institutions most at risk in the event of a sharp rise in interest rates should be encouraged to adapt their funding strategies to reduce the mismatch between fixed rate assets and floating rate liabilities.

55. Most of the issues highlighted in this report are not likely to be a source of immediate concern, but rather need to be addressed to ensure the stability of the system over the medium term. The current highly liquid state of many markets, while posing its own challenges, also provides an opportunity to address underlying structural inefficiencies of the system with lower cost than might otherwise be the case.