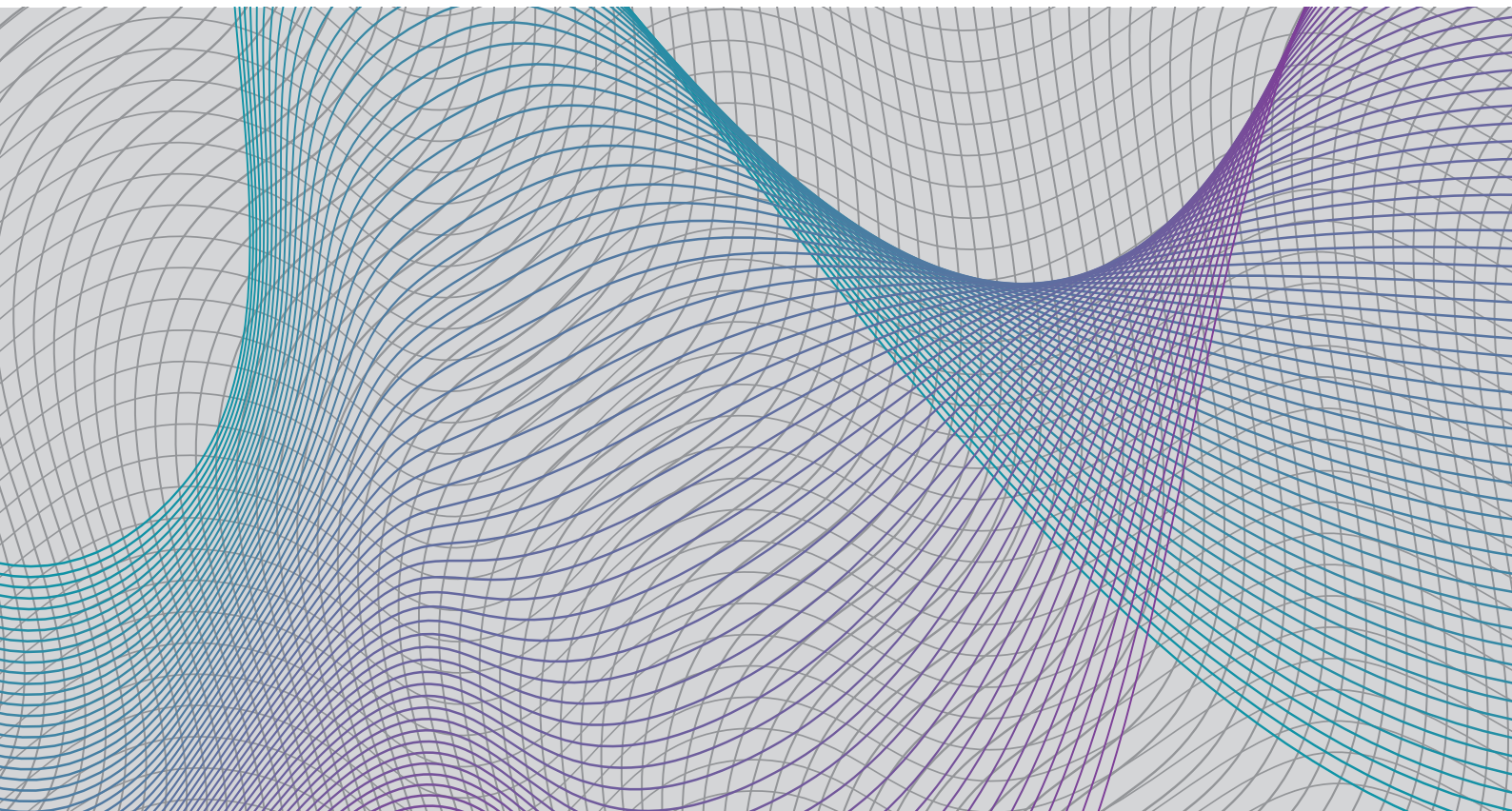




Financial Stability Review 2015



Deutsche Bundesbank
Wilhelm-Epstein-Strasse 14
60431 Frankfurt am Main, Germany

Postfach 10 06 02
60006 Frankfurt am Main, Germany

Tel +49 69 9566-0
Fax +49 69 9566-3077

<http://www.bundesbank.de>

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Abbreviations and symbols

p	Provisional
e	Estimated
.	Data unknown, not to be published or not meaningful
–	Nil

Discrepancies in the totals are due to rounding.

Introduction

Given its public mandate to safeguard monetary stability, the Bundesbank has an inherent interest in ensuring a stable financial system. As an integral part of the European System of Central Banks, it is also explicitly tasked with helping to maintain financial stability.

The Bundesbank's shared responsibility for safeguarding financial stability stems, above all, from its involvement in macroprudential supervision. The Bundesbank President is a member of the European Systemic Risk Board (ESRB), which is responsible for macroprudential oversight at the European level. Bundesbank representatives also sit on the German Financial Stability Committee (*Ausschuss für Finanzstabilität*), which discusses the factors relevant to the stability of the financial system, based on the Bundesbank's analyses. When faced with threats that may harm financial stability, the Committee can issue public or non-public warnings and recommendations. Moreover, the Bundesbank helps to uphold financial stability through its involvement in banking supervision and its role in operating and overseeing payment systems.

The Bundesbank defines financial stability as a state in which the key macroeconomic functions, ie the allocation of financial resources and risks as well as the settlement of payment transactions, are performed efficiently – particularly in the face of unforeseen events, in stress situations and

during periods of structural adjustment. Unlike microprudential supervision and regulation, which aims to ensure the stability of individual institutions, the macroprudential perspective focuses on the stability of the financial system as a whole. The identification of systemic risks plays a major role in this approach. Such risks arise when the distress of a systemically important market participant (such as a bank, insurer or other financial intermediary, but possibly also an infrastructure provider) jeopardises the functioning of the entire system. This can occur when the distressed market player is very large (too big to fail) or closely interlinked with other market actors (too connected to fail). But systemic risk also arises when a plurality of small market participants are exposed to similar risks (too many to fail).

The aim of the ongoing analysis of the stability situation is the timely detection of underlying changes and emerging risks in Germany's financial system that may endanger its stability. This includes taking account of feedback effects within the global financial system, interdependencies between the financial sector and the real economy, and the repercussions of the regulatory framework for the efficiency and smooth functioning of the financial markets. The Bundesbank's stability analysis follows a risk-oriented approach based on downside scenarios.

Account has been taken of developments up to the cut-off date of 20 November 2015.

Overview

Exceptionally low interest rates and moderate growth remain the two salient features of the economic and financial environment in Germany in 2015. The risks to Germany's financial system connected with the ongoing low interest rates, which were already highlighted in previous editions of the *Financial Stability Review*, persist.

The quantitative easing programme adopted by the Eurosystem in January 2015 caused expectations about the timing of the exit from the expansionary euro-area monetary policy to retreat further into the future. The non-standard monetary policy instruments deployed by the ECB, such as quantitative easing, were designed to operate not least through the credit, risk-taking and asset price channels, all of which are also relevant to financial stability.

To the extent that monetary policy contributes to rising asset prices and encourages risk-taking behaviour by economic agents, there is a danger

Monetary policy indirectly influences the pricing of risks of assets such as equities, corporate bonds and real estate.

that asset price bubbles may form and that risks may be systematically underestimated. Studies have shown that monetary policy indirectly influences the pricing of risks of assets such as equities, corporate bonds and real estate.¹ The channels via which the currently expansionary monetary policy is being transmitted to the financial system and the real economy are thus conduits through which risks to financial stability can build up.

Low interest rates do not necessarily entail higher risks to financial stability. However, problems may

arise if frictions cause risk premiums to drop to exceptionally low levels. Examples of such frictions include constraints faced by certain investors in their investment policy which require their liabilities to be remunerated at a fixed nominal rate.²

Problems may arise if frictions cause risk premiums to drop to exceptionally low levels.

Falling interest rates give these investors an incentive to acquire higher-yielding, higher-risk assets in order to meet their contractual fixed-rate commitments.³ One outcome of this phenomenon is a collective under-recognition of downside risks.

Similarly, keen market competition does not solely have beneficial effects but can also encourage excessive yield-seeking among financial institutions, as an inverse relationship exists between competitive intensity and the present value of future profits (franchise value). A lower franchise value, however, will lead to a greater propensity to take risks since shareholders have less to lose if the entity becomes insolvent.⁴ In addition, credit bubbles can form if expectations of continuously rising asset prices lead to excessive credit-financed investment.

The behaviour of financial market agents is additionally influenced by the regulatory framework. The

¹ See, for example, B Bernanke and K Kuttner (2005), M Gertler and P Karadi (2013), R Greenwood and S Hanson (2012) and Deutsche Bundesbank (2015).

² See R Rajan (2006).

³ This behaviour is similar to the phenomenon described in the literature as "risk shifting". See M C Jensen and W H Meckling (1976).

⁴ See M C Keeley (1990). Theoretically speaking, however, important effects could be operating in the opposite direction: in this case, banks would tend to take greater risks as markets become less competitive. See J Boyd and G de Nicoló (2005).

regulatory measures adopted in the aftermath of the financial crisis seek to improve the incentives for risk-sensitive behaviour and to increase risk buffers. However, new misincentives may be created, which could lead to risks being shifted to less regulated areas or encourage investors to incur the same type of risk.

Threats to financial stability can additionally ensue if investors have adapted their investment policy to the long-run (risk-free) interest rate. Banks' maturity transformation practices may cause them to incur higher interest rate risk. If interest rates were to go back up in the future, refinancing today's loans granted at today's low interest rates would become more expensive, thereby making institutions less solvent. Such risks cannot be diversified across the financial system, and, if they are too large, they represent systemic risk.

It is crucial to address these risks adequately⁵ in order to avert a medium-term trade-off between monetary policy and financial stability.⁶ Otherwise, given the build-up of risks to financial stability, monetary policymakers might postpone the warranted normalisation measures for too long, the precise effect of which would be to cause further risks to accumulate.

Risks must be addressed to avert a medium-term trade-off between monetary policy and financial stability.

Global financial system demonstrates robustness

During 2015, the global financial system was exposed to two stress situations: the debate about Greece's future within the euro area and risks emanating from the emerging markets. Europe's financial system proved quite robust to the uncertainty

created by the negotiations with Greece on the further implementation of the second assistance programme and the disbursement of outstanding assistance funds. Even the increased uncertainty surrounding Greece's future within the euro area following the Greek referendum did not lead to major dislocations in the European financial system, not least because the private sector's remaining direct exposure to Greece was very limited. Although the Chinese stock market crash in the summer of 2015 coincided with a reappraisal, and in some cases a downward revision, of earlier expectations regarding the economic outlook for China and other major emerging market economies, calm was very quickly restored on the global financial markets, and the situation did not deteriorate into a destabilising and escalating crisis.

Current developments in the international financial markets are being shaped to a major degree by the US Federal Reserve's announcement that it will taper its monetary policy and raise interest rates in due course. The persistent uncertainty about the exact timing of the interest rate rise has dampened investors' risk appetite in some financial market sectors. A tightening of US monetary policy could also affect returns on European securities via the interest rate linkage.

Risk situation in the German financial system characterised by low interest rates

Banks and insurers perform different functions in the financial system. Insurers obtain their funding largely from policyholders' premium payments, which are usually available to them over the long term. Banks, on the other hand, derive their funding

⁵ Action needs to be taken in all (national) policy areas, since the existing macroprudential instruments are virtually untested, their impact uncertain and the toolkit incomplete, eg in the field of real estate financing.

⁶ See Deutsche Bundesbank (2015), pp 39-71.

particularly from deposits and the interbank market. Both of these instruments are more short-term in nature. In principle, banks and insurers should follow an investment policy which is commensurate with the maturities of their liabilities, thereby at the same time mitigating risks to financial

Banks and insurers have an incentive to invest in long-term assets in order to stabilise returns.

stability. However, in the current low-interest-rate environment, in which Federal bonds (Bunds) with a maturity of up to nine years have been yielding negative returns, both groups of intermediaries have an incentive to invest in long-term assets in order to stabilise their returns. This could push yields on long-dated assets to low levels not justified by fundamentals.

Margins in the German banking system have been declining for several decades now. This structurally weak profitability is often ascribed to intense competition.⁷ The low-interest-rate environment has amplified this trend. Intense competition constrains institutions' scope for setting prices, on both the asset and liability side. Banks will therefore find it very hard to pass on negative interest rates on deposits held with the Eurosystem. Although the relationship between competition and risk-taking is theoretically inconclusive, studies for Germany show that banks with greater price-setting scope will tend to take less risk.⁸

German life insurers, too, can pass on their lower investment returns to their policyholders only to a limited extent, since the guaranteed returns under their long-term insurance portfolios are still very high and are receding only gradually owing to the long-term structure of their payout commitments. It is conceivable that German life insurers might respond to the lower interest rates by taking on greater risk and thereby contribute to a mispricing of risk.

German banks' resilience improved

In Germany, the low-interest-rate environment is primarily affecting small and medium-sized banks, which traditionally earn most of their revenue through credit and deposit business and conduct maturity transformation on a considerable scale. In the past, they managed to offset the adverse impact on their earnings by expanding their business volume and cutting back their risk provisioning. According to a Bundesbank survey on the impact of the low-interest-rate environment, however, a significant reduction in profits should be expected over the medium term. While credit institutions, on the whole, do not appear to be taking on excessive risks so far, interest rate risk has risen.

While credit institutions do not appear to be taking on excessive risks so far, there are signs of increased interest rate risk.

German banks have continued to improve their resilience. At the end of the second quarter of 2015, the German banking system's aggregate tier 1 capital ratio stood at 15.6%, 6.5 percentage points more than at the start of 2008. Their leverage ratio, expressed as the ratio of tier 1 capital to total assets, likewise points to enhanced resilience.

Banks' current capital appears sufficient to enable them to survive under adverse macroeconomic conditions. This is borne out by the outcome of a stress test in which the Bundesbank modelled the simultaneous occurrence of multiple macroeconom-

Banks' capital appears sufficient to enable them to survive under adverse macroeconomic conditions.

⁷ See M Koetter (2013).

⁸ See C M Buch, C T Koch and M Koetter (2013), as well as T Kick and E Prieto (2013).

ic events over a three-year period. This is subject to the caveat that the stress test did not look at some key aspects such as liquidity risk or feedback loops with the real sector. Hence the result probably understates the actual impact of the shock on banks' capital adequacy.

German life insurers insufficiently resilient

There are no signs to date of a broadly based tendency towards increased risk-taking on the part of German life insurers, despite a recent increase in the share of funds they invest in equities and corporate bonds.

That said, the sector's resilience remains insufficient. Although the measures adopted in the Life Insurance Reform Act (*Lebensversicherungsreformgesetz*), which came into force in August 2014, *per se* improve insurers' own funds base by reducing outflows of funds, a scenario analysis conducted by the Bundesbank shows that the new measures will

Life insurers should set aside adequate capital against their risks in good time.

not be able to offset the impact of the further drop in interest rates. Conventional indicators cannot adequately model the resilience of life insurance companies in this context since they do not fully capture the hidden liabilities and hidden reserves created by the low interest rate levels. The new Solvency II supervisory regime, due to take effect at the beginning of 2016, will gradually disclose actual risk. Although there is a 16-year transition period prior to full implementation of Solvency II, insurers should set aside adequate capital against their risks in good time.

It should be noted that the (at present relatively unlikely) scenario of an abrupt and steep increase in interest rates could pose risks to the stability of life insurers. This scenario could lead to a wave of policy

lapses, as rising interest rates could erode the value of the securities in life insurers' portfolios. The surrender values guaranteed to policyholders, by contrast, would not change. Once a critical interest rate level is reached, surrender values would no longer be fully covered by capital. Policyholders would consequently stand to gain by allowing their policies to lapse and reinvesting the surrender values at the higher interest rate. This risk is similar to banks' interest rate risk inasmuch as balance sheet assets are more sensitive to a change in interest rates than are liabilities.

Barely any rise in systemic risk in the German shadow banking sector

The tighter regulation of the banking sector in the wake of the financial crisis has created incentives to shift financial transactions, along with the associated risks, to other segments of the financial system. This was indeed partly what the regulatory initiatives set out to achieve. However, risks to financial stability may arise if activities and risks are shifted to other financial system segments only because they are more lightly regulated there.

The weight of the German shadow banking industry has grown in recent years relative to the rest of Germany's financial system. This is due not only to inflows of funds but also to increases in the value of the assets under management in the shadow banking industry. Germany's shadow banking actors are generally regulated entities such as mutual funds.

No increase in risk-taking is evident at present. In the past few years, key indicators of risks for the German shadow banking industry have been flat-lining. Maturity and liquidity transformation in the mutual fund sector as a whole have remained largely stable. In addition, leverage through the use of debt or repos tends to be on the low side. Moreover, investors in mutual funds, such as insurers and

pension funds, tend to invest over the long term. However, the fund sector is continuing to become more concentrated, thereby causing the significance of individual capital management companies and mutual funds to grow. This concentration process may give rise to intermediaries whose increased presence in the financial markets can make them systemically important.

All in all, no excessive risk-taking is currently discernible in the individual sectors of the German financial

No excessive risk-taking is currently discernible in the individual sectors of the German financial system.

system. The exceptionally low interest rate level, however, continues to create incentives for such risk-taking. The financial system therefore requires ongoing close

monitoring. Moreover, regulatory gaps need to be closed and the resilience of the system as a whole needs to be enhanced further.

Important macroprudential instruments ready for deployment as from 2016

Implicit guarantees for major market players regarded as “too big to fail” are a major factor that can have a destabilising effect on the financial system. In order to make global systemically important banks (G-SIBs) more resilient and to reduce the likelihood of government bail-outs, these institutions will be required as from 1 January 2016 to build up an additional capital buffer linked to the institution’s systemic importance and made up of common equity tier 1 (CET 1) capital. A capital buffer requirement linked to each institution’s systemic importance can likewise be imposed on other systemically important institutions as from next year. In the course of 2015, the Bundesbank and the Federal Financial Supervisory Authority (BaFin) have jointly developed a meth-

odology for identifying other systemically important institutions.

Additional capital buffers will enable institutions to absorb losses better. However, in a market economy it should also be possible for (systemically important) institutions to fail without recourse to public funds. It is therefore necessary for these institutions to have adequate loss-absorbing capital. At the European level, the Bank Recovery and Resolution Directive (BRRD)

contains provisions which set a minimum requirement for the own funds and eligible

Institutions must have adequate loss-absorbing capital.

liabilities (MREL) to be maintained in the event of resolution. A concern from a financial stability perspective is that other banks are permitted to hold an unlimited quantity of each other’s MREL, so long as the resolution authority gives its consent. Unlike the rules for MREL, the total loss-absorbing capacity (TLAC) standard developed by the Financial Stability Board (FSB) provides for the prudential treatment of banks’ holdings of such instruments. The European directive should be amended accordingly.

Starting in 2016, another macroprudential instrument will be available for the banking sector in the form of the countercyclical capital buffer (CCB). This instrument is intended to better address the risks created by the financial cycle.⁹ During spells of excessive credit growth, institutions should build up additional own funds which can then be used to absorb losses in a crisis situation.

Up to now, Germany has not had any macroprudential instruments which directly address the lending relationship between the creditor and the borrower. Such instruments could be used to directly target systemic risk in specific assets. While the compar-

⁹ See Bank for International Settlements (2014), pp 73-95 regarding the financial cycle.

actively strong upward price trend on the German real estate market has continued, the risk of a price correction accompanied by mass mortgage defaults is currently low. In June 2015, the German Finan-

German Financial Stability Committee recommended the Federal Government to draft legislation for new macroprudential instruments for residential real estate financing as a precautionary measure.

cial Stability Committee recommended the Federal Government to draft legislation for new macroprudential instruments for residential real estate financing as a precautionary measure. High-quality data are a precondition for ana-

lysing and assessing measures. Apart from the volume of individual real estate loans, no other microprudential data, such as the share of borrowed funds, are currently collected in Germany. In order to better assess the systemic risk emanating from the real estate financing market, these data gaps should be closed.

High-quality microdata are indispensable, too, for evaluating macroprudential policy, since the deployment of macroprudential instruments should always be assessed in terms of the extent to which the policy goals are actually achieved. That includes an *ex ante* estimate of the instrument's expected impact and an *ex post* assessment of target achievement.

Further efforts necessary at European level

A key milestone along the road to greater financial stability in the euro area was reached in the past year with the establishment of the European banking union comprising the Single Supervisory Mechanism (SSM) and Single Resolution Mechanism (SRM). The purpose of the SSM is to reduce regulatory arbitrage and achieve greater harmonisation of banking supervision across Europe. Its necessary complement is the SRM, which better aligns liability and control.

Whenever banks are resolved, the new creditor bail-in rules should be rigorously applied in order to enhance confidence in the banking union. Exceptions to the principle of creditor liability should be minimised, and authorities' discretionary scope constrained. Otherwise, stability risks could arise in the future under the guise of protecting systemic stability today.¹⁰ In order to complete the banking union, it is also important to eliminate misincentives that may emanate from regulation. For instance, banks' and insurance companies' exposure to euro-area countries is given privileged regulatory treatment. This creates a nexus between financial institutions and sovereigns which can pose a systemic risk.

Banks' and insurers' exposure to euro-area countries is given privileged regulatory treatment, which can give rise to systemic risk.

A reform of insurance regulation (Solvency II) will enter into force next year. When approving internal models, efforts should be made as of now to ensure that a sufficient amount of capital is held against all types of risk – including sovereign risk. The calculation of sovereign risk should be reassessed as part of the review of the standard formula for calculating capital requirements, which is scheduled for 2018. The macroprudential implications of Solvency II will be reflected in a timelier capture of the risks arising from the low-interest-rate environment, since the market-based valuation of assets and liabilities is a core element of the new rules. But the future solvency balance sheet – largely based as it is on fair values – might also present a more volatile picture of insurers' resilience than that currently depicted under Solvency I.

On balance, Solvency II should be better suited to modelling risks to financial stability. However, the

¹⁰ See Deutsche Bundesbank (2014), pp 74 ff.

impact of the measures to dampen procyclical behaviour (Omnibus II Directive) should be reviewed in the coming years, as they could impair the informative value of the solvency ratio and excessively lower the capital requirements.

One of the salient features of the present-day structure of Europe's capital markets is rather poor cross-border risk sharing in the euro area. At the moment Europe's capital movements across national frontiers consist largely of debt-financed investment by banks. Bank lending performs a useful microeconomic function wherever information asymmetries and incentive problems exist between enterprises and investors. However, excessive leverage and excessive debt in international capital flows can create risks for financial stability.

The European Commission initiated its capital markets union project with the goal of evolving and integrating European capital markets beyond the banking sector. The development and integration of European equity capital markets can help enhance financial stability. The objective should be to create a framework in which an efficient market outcome can emerge.

The development and integration of European equity capital markets can help enhance financial stability.

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Risks in the German financial system

The macroeconomic and financial environment

The global financial system faced two stress situations in 2015. As the year progressed, market participants' uncertainty as to whether Greece would remain in the euro area increased. A second test followed when significant corrections on the Chinese stock market and the global commodities markets raised questions about the growth prospects for China and other important emerging market economies. However, the situation on the financial markets calmed down fairly quickly in both instances, and there was no destabilising spiral into crisis.

Developments in the international financial system are being driven by the diverging monetary policies in the major currency areas. In the euro area, expectations about the timing of an interest rate hike have been pushed back. This means that market participants still have an incentive to take greater risks as long as the low-interest-rate environment continues. As interest rates are linked, monetary policy tightening in the United States could, in principle, also affect yields on European securities. At present, the uncertainty as to when the United States will see an interest rate hike is dampening investors' appetite for risk.

In order to identify risks to financial stability and take the appropriate policy measures, it is important to understand the structural features of the German financial system. One relevant issue in this context, for instance, is how closely interconnected the German financial system is across borders. This chapter therefore discusses which financial intermediaries are most important and how closely they are interconnected.

Financial system proving robust during episodes of stress

During 2015, the global financial system was exposed to two stress situations: the debate about Greece's future within the euro area and risks emanating from the emerging markets.¹ The formation of a new government in Greece in January 2015 following snap elections caused much uncertainty as to the economic and fiscal policy course the country would henceforth steer. Market participants' uncertainty regarding whether Greece would remain in the euro area peaked halfway through 2015. There was, however, no evidence of significant contagion effects on the financial markets of other European countries that were particularly badly affected by the debt crisis. Sovereign bonds issued by these countries mirrored Greek government bonds' rise in yields only to a very limited degree. Nor did these countries experience any difficulties refinancing their government debt. The stock markets recovered their losses within a matter of days.

The direct impact on the banking sector was also small, which can probably be explained by several factors. First, European credit institutions had already reduced their exposure to Greece so significantly that they could have coped with a default; risks were shifted from the private to the public sector (see Chart 1.1.1). Second, European banks have also clearly improved their capital position and thus their resilience (for more information, see also the chapter entitled "Risks in the German banking sector" on pages 29 to 40). Indirect effects have likely been contained through the creation of the banking union and the resulting positive confidence effects.

A second episode of stress followed halfway through 2015 when an increase in financial market volatility in China spread to the global financial system. Risks had been building up in the Chinese financial sys-

tem for some years. Prices for assets such as equities and real estate had risen markedly, accompanied by strong credit growth, in part from the shadow banking system. From June to September 2015, the Chinese stock market suffered sharp price corrections. Concerns about the potential global effects of an economic slowdown in China spread directly to the financial markets worldwide.

Concerns about the potential global effects of an economic slowdown in China spread directly to the financial markets worldwide.

Emerging market economies with close trade ties with China are particularly susceptible to contagion effects. Some of these countries are commodity exporters. These are at greater risk, as the decline in commodity prices, which started back in 2014, has already weakened their external position and growth. Emerging markets with internal or external imbalances, such as Brazil, South Africa or Turkey, could also be affected via confidence effects. In many of these countries, private sector debt has expanded considerably.² Countries in which the corporate sector has increasingly taken on US dollar debt in recent years, in particular, may face problems. However, the periodic tensions on the global financial markets have not yet led to a spiral into crisis with the potential to jeopardise financial stability.

¹ For previous comments on developments in the emerging markets and challenges resulting from the European debt crisis, see Deutsche Bundesbank (2013), p 38, and Deutsche Bundesbank (2014), p 25.

² According to the International Monetary Fund (IMF), credit growth as compared to gross domestic product (GDP) deviated from its long-term trend (credit-to-GDP gap) by more than 10% in Brazil and Turkey, for instance, at the end of 2014. See International Monetary Fund (2015b), p 10. For more information on the credit-to-GDP gap, see also the chapter entitled "Macroprudential policy" on pp 71-83.

Major central banks' asynchronous monetary policies have potential to create tensions

Exceptionally low interest rates and moderate growth remain the two salient features of the macroeconomic and financial environment in Germany (see Chart 1.1.2). Since the 2014 *Financial Stability Review*, the monetary policy conditions, and with them the outlook for global interest rates, have changed, however. The Eurosystem has launched the public sector purchase programme (PSPP). As a result, the expected timing of an interest rate hike in the euro area has been pushed further back.

The expected timing of an interest rate hike in the euro area has been pushed further back.

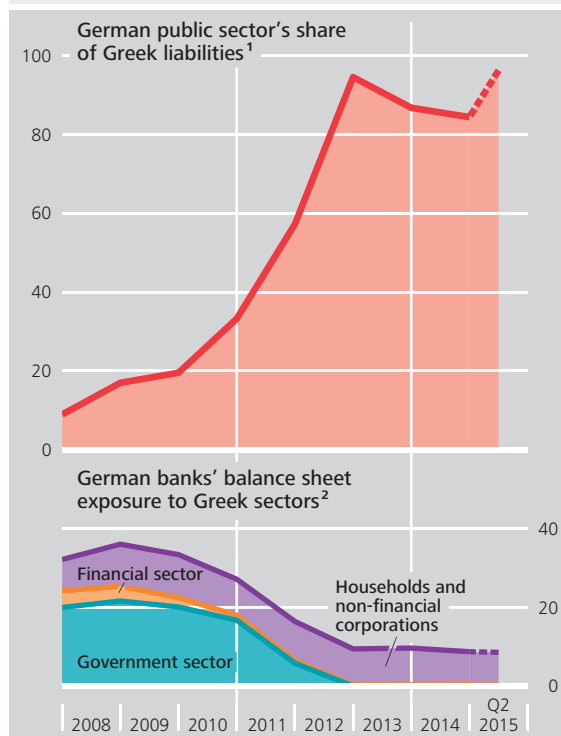
If the low-interest-rate environment continues, the danger will remain that investors take on heightened risks without having sufficiently high risk buffers. By contrast, the US Federal Reserve (Fed) announced that it would further tighten monetary policy and raise policy rates. A tightening of US monetary policy could have repercussions for the yields on European bonds, as interest rates tend to move in lockstep. Amid uncertainty concerning the timing of a rate hike in the United States, some areas of the financial markets have seen an increase in risk premiums in the second half of 2015.

Continued low-interest-rate environment entails risks

If European yields follow a rise in US interest rates only to a limited extent, there is much to suggest that – given the ECB's expansionary monetary policy – the low-interest-rate environment in the euro area will continue. If this encourages market participants to take greater risks without proper risk provisioning, abrupt changes to asset prices

Selected German creditors with exposure to Greek liabilities
 Chart 1.1.1

€ billion, year-end data



Sources: Information provided by central banks, EFSF, ESM, Deutsche Bundesbank's credit register for loans of one million euro or more, IMF and Bundesbank calculations. ¹ Includes the share, weighted using the applicable capital key for Germany, of Greece's TARGET2 liabilities to the Eurosystem, euro banknotes in circulation and the securities markets programme (SMP, contained only in the year-end data as of 2012) as well as of Greek debt as a result of financial assistance (EFSF, ESM and IMF). In addition, bilateral KfW loans are included. ² Excluding KfW loans.

Deutsche Bundesbank

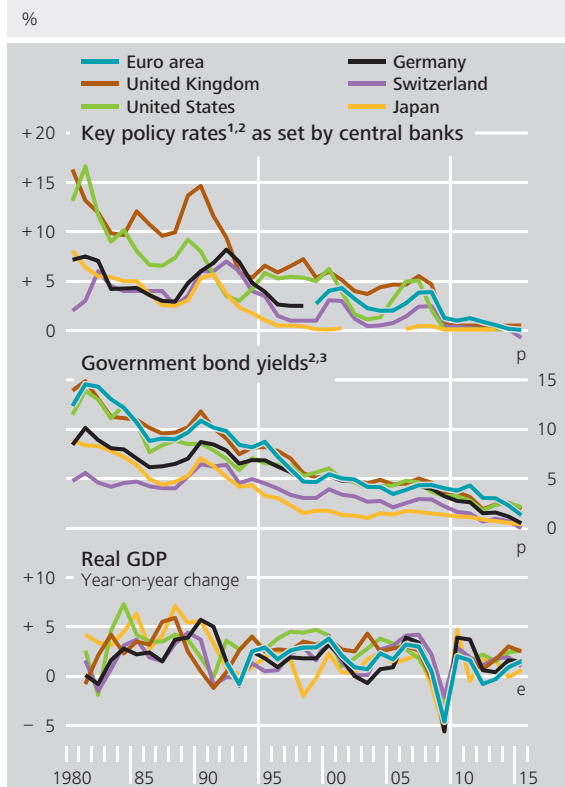
and liquidity conditions could threaten financial stability.³

The launch of the PSPP sent the already very low yields on euro-area government and corporate bonds down to historical lows.⁴ Starting with Federal bonds (Bunds), which at times recorded negative

³ See Deutsche Bundesbank (2015a), pp 49-55.

⁴ There is broad consensus that quantitative easing has caused long-term yields on government bonds and other fixed-income securities to drop. However, empirical studies come to different conclusions as to the strength of the decline. See, for example, J C Williams (2014) and J H Rogers, C Scotti and J H Wright (2014).

Global interest rate environment and economic development Chart 1.1.2



Sources: Data provided by central banks, IMF, OECD, Thomson Reuters Datastream and Bundesbank calculations. **1** Where there is a target range for key interest rates, the average between the upper and lower bound is shown. Japan: from March 2001 to March 2006, the Bank of Japan's monetary policy decisions were based on banks' outstanding current account balances with the central bank as well as, from April 2013, on the monetary base. **2** Annual averages. **3** With a residual maturity of ten years.
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amongst others, have risen with the correction of government bond yields. As at the end of October 2015, risk premiums for most euro and US dollar-denominated corporate bonds were back above their long-term averages. Based on certain assumptions, implied default rates for corporate bonds can be derived from risk premiums.⁶ These have risen and were close to historical default rates at the end of October 2015.

By contrast, volume indicators for the corporate credit markets present a mixed picture. In the euro area and in the United States, high bond issuance and syndicated lending prevail. In the United States, between January and October 2015, non-investment-grade debtors with poor credit-worthiness continued to make up a large share of syndicated loans, namely 47%. In the euro area, the share was roughly 24%.⁷ Investors in Europe were, moreover, willing to provide 80% of leveraged loans on a covenant-lite basis (as compared with a percentage of 10% in 2011).⁸ However, issuance declined in the second half of 2015. This suggests that investors' willingness to

Volume indicators for the corporate credit markets present a mixed picture.

yields for maturities up to nine years, there was a correction from the end of April 2015.⁵

Both price and volume indicators as well as non-price terms and conditions can be used to assess market participants' appetite for risk in various market segments. Price indicators for corporate bond markets have not suggested heightened appetite for risk of late. Risk premiums for corporate bonds,

Price indicators for corporate bond markets do not suggest heightened appetite for risk.

⁵ Several factors probably had a role to play, such as market players' one-sided positioning fostered by the PSPP, improved economic data for the euro area and market makers' unwillingness to hold counter positions.

⁶ Implied default rates are calculated from the risk premiums using a model based on an average level of risk aversion for market participants and average liquidity risk premiums. Under the model assumptions, the implied default rates reflect the average default rates anticipated by market participants. For more on the calculation method, see P Rappoport (2001).

⁷ Net issuance of syndicated loans is greater than net issuance on the corporate bond market both in the United States and in the euro area. The total market volume of syndicated loans in the non-investment-grade segment was 15.1% of GDP at the end of October 2015 in the United States and 2.9% of GDP in the euro area.

⁸ Investor protection clauses are being weakened. These are contractually binding commitments on the part of the debtor to meet certain requirements during the life of the loan (eg minimum capital ratios or debt ratio ceilings).

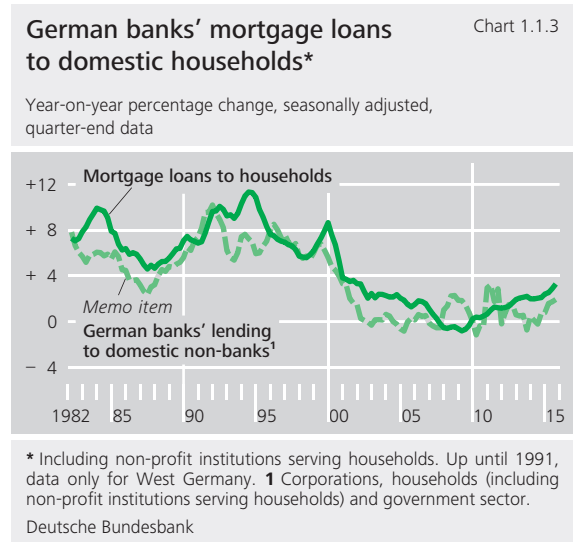
assume risk on the corporate credit market has fallen somewhat.

Various indicators can be used to identify mispricing on the stock markets. The price-earnings ratio (P/E ratio) for the Euro Stoxx 50, the S&P 500 and the DAX was slightly above the average of the last ten years despite share price losses at the end of October 2015. However, implied equity risk premiums are more meaningful than the P/E ratio.⁹ These were above their long-term averages at the end of October 2015. This suggests there is no overvaluation.

Moreover, an econometric test can be used to determine whether there are any signs of a stock market bubble (bubble test).¹⁰ The test is based on the assumption that share prices contain no time-varying risk premiums and usually follow a random walk. An emerging bubble, by contrast, is characterised by explosive price growth. The test therefore examines whether share price developments have moved from a random to an explosive path. In the period under review, which stretches from the beginning of 2014 into the fourth quarter of 2015, this bubble test yields no indication that a bubble is building up either for European or US share indices.

Prices on the German housing market continued to grow rapidly. This trend is supported not only by favourable financing conditions, but also by the positive economic performance. The upward trend in evidence since 2010 strengthened again in the first half of 2015 after weakening slightly in 2014. According to the Association of German Pfandbrief Banks, prices for owner-occupied housing rose by 4.6% in the first three quarters of 2015 as compared to the year-earlier period.

If prices continue to rise, creditors could be tempted to expand lending excessively and loosen credit standards. This can result in systemic risks. Although new lending accelerated significantly during 2015,



growth in mortgage lending to households can still be described as moderate in a longer-term comparison (see Chart 1.1.3). Moreover, household debt levels in Germany continue to decline, at least in aggregate terms (see Chart 1.1.4).¹¹ What is more, the Eurosystem's regular Bank Lending Survey shows that German banks have not loosened their lending standards for mortgage loans since 2014.

These data suggest that the risk of a price correction amid widespread defaults on mortgage loans is currently fairly low. The risks to financial stability emanating from the housing market therefore appear to be limited (see also the box entitled "Stress test

The risk of a price correction amid widespread defaults on mortgage loans is currently fairly low.

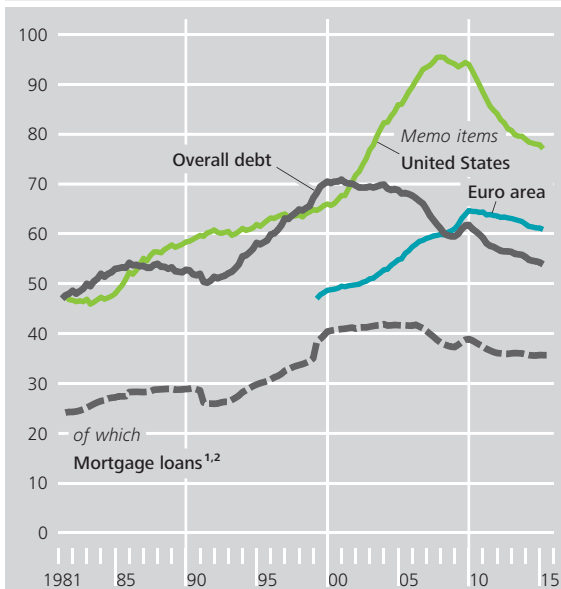
⁹ Calculated as the difference between a market implied return and the yield on government bonds. The market implied return is calculated from residual income ((return on equity minus cost of equity) x book value of equity in the previous period) and the prices of stock market indices.

¹⁰ For more information on the method used, see U Homm and J Breitung (2012).

¹¹ For more information on the significance of this indicator of aggregate household debt in early warning approaches, see, for example, T Knedlik and G von Schweinitz (2012) as well as B Büyükkarabacak and N Valev (2010).

Household debt in Germany* Chart 1.1.4

As a percentage of GDP,¹ quarter-end data



Sources: BIS, Bundesbank primary statistics and Bundesbank calculations. * Up until 1991, data for West Germany. Including non-profit institutions serving households. ¹ Seasonally adjusted. ² Granted by German banks.

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for residential mortgage loans to households in Germany” on pages 37 and 38).

A useful source of information when assessing the situation on the German housing market is the set of indicators published by the Bundesbank.¹² However, the detailed data on lending needed for an in-depth assessment of the potential risk are not yet available. These data gaps should be closed to allow the risks to financial stability emanating from the housing market to be assessed in a timely manner.

An abrupt end to the low-interest-rate environment also involves risks

Although rates are likely to remain very low on the money market in Europe, the low-interest-rate environment will not necessarily continue on the capital markets. Long-term interest rates in the euro area

are also influenced indirectly by monetary policy in the United States. A look at what has happened in the past suggests that if yields in the United States rise as a result of monetary policy decisions, Germany will probably not be able to withstand this in the long term. Ten-year Bunds and US Treasuries have been moving somewhat less in lockstep since the onset of the sovereign debt crisis. Nonetheless, it remains the case that when US interest rates move, others follow.

Although rates are likely to remain very low on the money market in Europe, the low-interest-rate environment will not necessarily continue on the capital markets.

A stronger or earlier-than-anticipated interest rate increase in the United States can therefore impact interest rates in the euro area. The implied probabilities of future interest rate increases based on fed funds futures give an indication as to what market participants expect in terms of future interest rate moves. There is a lot of uncertainty as to when the Fed will raise rates for the first time (see Chart 1.1.5). As at mid-November, slightly less than 35% of futures contracts were still not pricing in an interest rate hike for 2015.

In the past, changes to the US monetary policy stance have weighed heavily on a number of emerging market economies.¹³ In the summer of 2013, equity and foreign exchange market losses in emerging market economies provided a foretaste of the potential consequences of a monetary policy reversal in the United States. The large outflows from funds investing in emerging markets between June and September 2015 are an indication that

¹² The set of indicators is available at http://www.bundesbank.de/Navigation/EN/Statistics/Enterprises_and_households/System_of_indicators/system_of_indicators.html?nsc=true

¹³ See International Monetary Fund (2015a).

financing conditions have already deteriorated for several countries.

Overall, the emerging market economies should be better prepared for a tightening of external financing conditions than they were in the mid-1990s. Most now have more flexible exchange rates, more foreign exchange reserves and an improved net international investment position. Nonetheless, the financial market tensions emanating from China have revealed vulnerabilities in individual emerging market countries.¹⁴

Marked shifts in global interest rates could cause abrupt changes in risk appetite and a reassessment

Marked shifts in global interest rates could cause abrupt changes in risk appetite.

of emerging markets as an asset class. In such a setting, it would be quite conceivable for other risky market segments

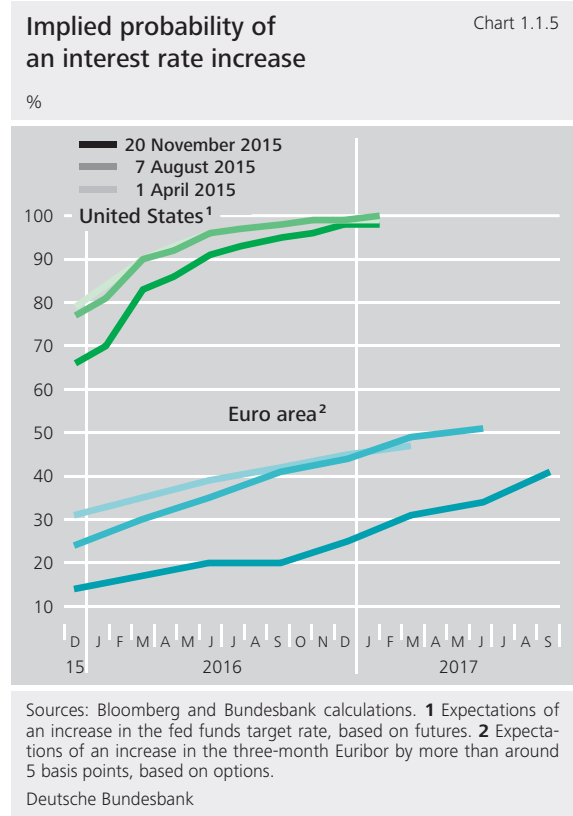
to be affected, too. Such feedback and contagion effects could weigh on the global financial system.

Sufficient market liquidity is essential when the financial system experiences periods of stress.¹⁵ Illiquidity can amplify market movements and cause them to spill over to other market segments. Regulatory and market-driven changes mean that banks have tended

This has increased the risk of market tensions being aggravated by insufficient liquidity.

to reduce their market-making activities, which are important for market liquidity.¹⁶ At the same time, the importance of asset managers has risen. If

the latter follow the herd during times of stress and all rush to liquidate their positions at the same time, there is strong demand for market-making activities. This has increased the risk of market tensions being aggravated by insufficient liquidity. Financial agents are then subject not only to liquidity risk, but also to higher market, credit and counterparty risk.



Some vulnerabilities have built up in the German banking system. In terms of market risk, German banks have, since 2011, increased their interest rate and credit spread risks especially (see also the chapter entitled “Risks in the German banking sector” on pages 29 to 40). Interest rate risk, which has been measured with the aid of the “Basel interest rate shock” since 2011, peaked among savings banks and credit cooperatives in 2015. Commercial banks hedge most of their interest rate risk. Nonetheless, risks may arise if hedging is concentrated on just a few counterparties.

Financial and economic ties mean that deteriorating conditions in the emerging markets can have a direct impact on Germany. There would be financial

¹⁴ See International Monetary Fund (2015b).
¹⁵ See Deutsche Bundesbank (2014), pp 15 ff.
¹⁶ See Committee on the Global Financial System (2014).

consequences if German banks' claims on Chinese borrowers, for instance, proved unrecoverable. In the second quarter of 2015, these claims totalled €33.3 billion (8.6% of balance sheet capital).¹⁷ German banks' exposure to larger emerging market economies as a whole was €193.7 billion (50.1% of balance sheet capital).¹⁸ Close economic ties with China mean that a slowdown in growth there would, according to model calculations conducted using NiGEM¹⁹ and other time-series econometric methods, also have a slightly negative impact on economic output in Germany and in the euro area.²⁰ In 2014, 6.5% of Germany's exports of goods were delivered to China.

Structure of the German financial system in flux

The stability of the financial system is influenced by various structural features. These include the size of financial intermediaries and their degree of interconnectedness. It is also important to look at ties with the real sector in order to estimate to what degree it could be affected by disruptions to the intermediation function. Finally, the danger of contagion from abroad is larger, the more closely the financial system is interconnected across borders.

Growing significance of intermediaries outside the banking system

Within Germany, the financial system is characterised by banks, insurance corporations, pension funds

Measured in terms of their assets, banks have the most important role to play of all financial intermediaries.

and the shadow banking sector.²¹ The financial assets of all these financial intermediaries totalled €13.1 trillion in the second quarter of 2015. That

was equivalent to around 440% of Germany's GDP. Measured in terms of their assets, banks had the most important role to play of all financial intermediaries (see Chart 1.1.6). The insurance industry and pension funds on the one hand and the shadow banking system on the other were roughly the same size – together, they managed approximately 38% of financial assets.

Interlinkages among intermediaries also have an important role to play in the structure of the German financial system (see Table 1.1.1). In the second quarter of 2015, they held claims against each other exceeding €1.8 trillion²² – roughly equivalent to 14% of German financial intermediaries' financial assets. More than half of interlinkages were accounted for by claims against investment funds. Insurance corporations and pension funds, in particular, have bought into investment funds. Other financial intermediaries' claims against banks represent the second-largest item in terms of intersectoral interlinkages. Insurance corporations hold roughly half of the total. Credit claims between members of the financial system play only a subordinate role.

A breakdown of financial intermediation based on the financial instrument used to provide capital shows that banks hold by far the most debt securities and loans. However, insurance corporations and investment funds are perceptibly expanding their

¹⁷ Data are on an ultimate risk basis. Ultimate risk takes into consideration risk-mitigating positions (eg guarantees and credit protection bought), which transfer the bank's credit risk from one counterparty to another.

¹⁸ Argentina, Brazil, Chile, China, Columbia, the Czech Republic, India, Indonesia, Hungary, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Saudi Arabia, South Africa, South Korea, Thailand and Turkey.

¹⁹ NiGEM is a model developed by the UK-based National Institute of Economic and Social Research (NIESR). For more information on the model structure, visit <http://nimodel.niesr.ac.uk>

²⁰ See Deutsche Bundesbank (2015b), pp 15-31, and S Eickmeier and M Kühnlenz (2013).

²¹ For a definition of the shadow banking sector, see the chapter entitled "Risks in the German shadow banking system" on pp 57-68.

²² Intrasectoral claims were not taken into consideration.

claims in the form of debt securities. From the first quarter of 2008 to the second quarter of 2015, they have, in some instances, more than doubled their holdings of debt securities, while banks' holdings were unchanged in the same period.

A look at the interlinkages between the German financial system and the real sector shows that the majority of intermediation takes place between households and financial institutions (see Table 1.1.1). Households are both debtors and creditors vis-à-vis banks, though claims exceed liabilities.

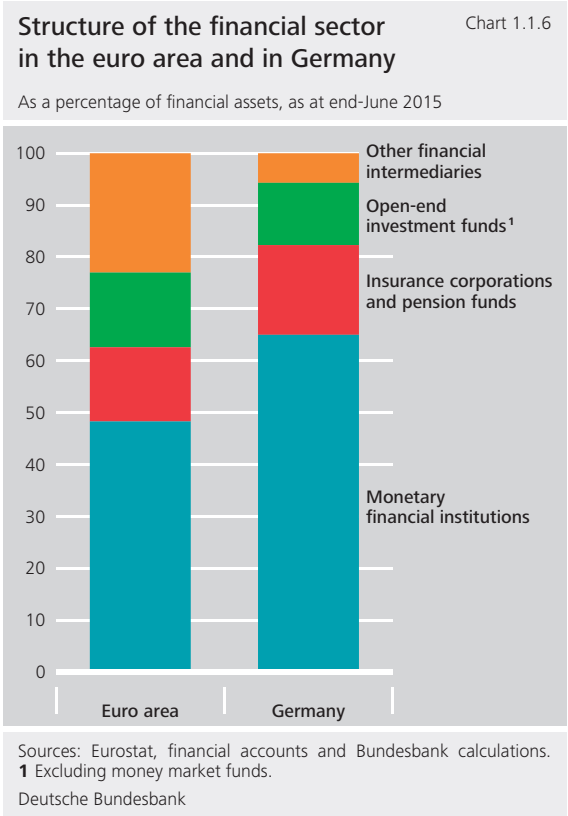
Non-financial corporations use financial institutions less for intermediation than households.

Non-financial corporations use financial institutions less for intermediation than households; this has become slightly more pronounced in recent

years. One reason is that capital is also made available within the real sector. This constitutes in large part funding among non-financial corporations (eg suppliers' and trade credits, loans to subsidiaries). However, households also provide enterprises with capital, eg in the form of payments into corporate pension funds. Overall, German non-financial corporations' internal funds exceed their gross investments. In aggregate, they have almost always been net creditors since the year 2000.

German financial system marked by close cross-border ties

Strong cross-border interconnectedness is a feature of the German financial system. As measured by their investment portfolios, German insurance corporations have the largest percentage of foreign assets. In the second quarter of 2015, such assets represented more than 65% of the total. Non-euro-area countries make up more than half of their foreign exposure. In the shadow banking sector, cross-border claims represented slightly more than



60% of total financial assets. The largest part of the cross-border holdings is the result of investment funds buying foreign debt securities. Not surprisingly, the focus of German banks' business activities is on the domestic market. Nonetheless, here too, foreign assets made up almost 26% of total assets in September 2015.

Strong cross-border interconnectedness is a feature of the German financial system.

The close cross-border ties reflect the capital exports associated with large current account surpluses. Foreign assets are a sensible part of any diversified business strategy and can help each individual institution spread its risk. The European Commission's capital markets union project offers an opportunity to further improve the conditions for such activities (see also the chapter entitled "Capital markets union – financial stability and risk sharing" on

Interlinkages in the German financial system*

Table 1.1.1

Quarter-end data as a percentage of GDP, as at June 2015

Debtors	Creditors							
	Households ¹	Non-financial corporations	Government sector	Monetary financial institutions	Other financial intermediaries	Insurance corporations	Pension funds	Investment funds ²
Households ¹	–	–	–	50.7	0.5	2.2	0.4	–
Non-financial corporations	14.4	36.6	3.3	27.5	2.1	1.5	0.0	3.1
Government sector	0.4	0.4	0.7	23.3	0.0	4.7	0.6	2.5
Monetary financial institutions	74.8	15.6	8.0	57.7	3.1	10.9	3.4	4.5
Other financial intermediaries	0.4	3.7	0.0	5.0	0.0	0.3	0.0	0.2
Insurance corporations	42.1	0.3	0.0	0.2	0.2	3.9	0.0	0.4
Pension funds	15.3	–	–	0.0	–	0.1	0.0	–
Investment funds ²	9.5	4.3	0.6	5.8	0.7	17.0	9.7	6.1

Sources: Financial accounts and Bundesbank calculations. * The information includes data on claims in the form of deposits, debt securities, loans, listed shares, investment fund shares, claims from insurance technical reserves and trade credits (only for non-financial corporations). ¹ Including non-profit institutions serving households. ² Excluding money market funds.

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pages 85 to 94). At the same time, it is important to further monitor the risks that cross-border holdings could entail for the German financial system.

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Risks in the German banking sector

The low-interest-rate environment is affecting profitability in the German banking system, which has been weakening for some time on account of structural factors. A low interest rate level generally leads to a reduction in net interest margins. Furthermore, the possibilities of maturity transformation are substantially restricted by a flat yield curve. This can result in small and medium-sized banks, in particular, being put under pressure. These traditionally generate a large part of their income from lending and deposit business and conduct maturity transformation on a considerable scale.

So far, the low-interest-rate environment has had a limited impact on the profitability and stability of the banking system. The institutions have become more resilient over the past few years, as the banks have improved their capital position and reduced their leverage. Moreover, at present there are hardly any signs that the banks are systematically assuming higher credit risks in order to stabilise their income. Even so, banks' interest rate risk has increased. This means that they are more vulnerable to an abrupt rise in short-term interest rates.

The combination of a continuing environment of low interest rates together with structurally weak profitability harbours considerable risks for the banking system over the medium term. It is therefore important that banks continue to cut their costs and to reduce their interest rate risk. In addition, the banks should press ahead with increasing their equity capital and lowering their leverage.

Effects of low interest rates on profitability still limited

In the German banking system, margins have been declining for a number of decades.¹ A persistent low-interest-rate environment places additional

At present, the effects of low interest rates on the profitability of German banks are still limited.

pressure on the banks' earnings. At present, the effects of low interest rates on the profitability of German banks are still limited.

A Bundesbank survey on the impact of the low-interest-rate environment shows, however, that earnings are likely to decline markedly, the longer interest rates remain at a low level.²

Risks to the stability of the banking sector are thus increasing. Weak profitability can lead to banks systematically taking higher risks or increasing their leverage in the search for yield. So far, there have been few signs of this, however. Furthermore, low earnings in future could impair banks' resilience, as retention of profits is a major source of capital formation for many institutions.

In order to stabilise their profitability on a sustainable basis, banks should continue their efforts to lower their costs.³ From a macroprudential perspective, it would also be desirable to become less dependent on interest business in favour of expanding other lines of business. Moreover, the banks should press ahead with increasing their equity capital and reducing their leverage.

Resilience of the German banking system stronger overall

The profitability of the German banking system showed a slight improvement in 2014. There was a

marginal year-on-year increase in operating income, for example. At the same time, the institutions became more resilient. For the aggregate of banks active in Germany, the tier 1 capital ratio, defined as the ratio of tier 1

capital to risk-weighted assets, increased between June 2014 and June 2015 by

In 2014, the institutions became more resilient.

0.6 percentage point to 15.6%. This meant it was 6.5 percentage points higher than at the beginning of 2008. The year thus also saw a continuation of the long-term trend of an improvement in the capital position.⁴ As measured by their leverage ratio, defined as the ratio of total assets to tier 1 capital, institutions' resilience has also improved over the past few years (see Chart 1.2.1).

To gain a more nuanced picture of the risk situation in the German banking system, it is necessary to undertake separate analyses of developments in the group of the 12 major banks with an international focus and in the case of the savings banks and cooperative banks.

Situation of large banks continues to be stable despite weak profitability

The major German banks with an international focus are crucial for the stability of the financial system

¹ On structurally weak profitability, see A Brunner, J Decressin, D Hardy and B Kudela (2004), German Council of Economic Experts (2013), and Deutsche Bundesbank (2015a). On the low-interest-rate environment, see R Busch and C Memmel (2015).

² Between 19 May and 28 June 2015, the Bundesbank conducted a survey on the impact of the low-interest-rate environment on the profitability and resilience of German credit institutions; roughly 1,500 institutions were surveyed, including commercial banks, savings banks and cooperative banks.

³ For German banks, the cost-income ratio, a key financial measure of cost efficiency, stood at 73.6% in June 2014, while the median value for the other euro-area countries was 55.3% (according to ECB consolidated banking data).

⁴ Nevertheless, M Behn, R Haselmann and V Vig (2014) show that the probabilities of default for determining the risk weights in internal models could be underestimated.

owing to their size and their interconnectedness with the other institutions via the interbank market.

These banks' profitability has been structurally weak for some years.⁵ The major banks' return on assets – the ratio of the annual profit or loss before tax to total assets – increased in 2014 for the third time in succession and reached its highest level since 2010 (see Chart 1.2.2). Even so, at 0.2%, it was still

The major banks' return on assets increased in 2014 for the third time in succession and reached its highest level since 2010.

at a low level by international comparison.⁶ Moreover, the return on equity of the major banks with an international focus, at just

under 5%, was comparatively small. Poor profitability makes it more difficult to raise equity on capital markets. Even so, a low return on equity does not necessarily imply higher systemic risks as long as the banks possess sufficient capital. By international comparison, the major German banks occupy a mid-table position following an increased build-up of equity capital over the past few years.⁷ This development has been accompanied by a reduction in total assets and a partial withdrawal to the domestic market in the wake of the global financial crisis and the sovereign debt crisis in the euro area.

The major banks have recently been expanding their international business activity again. One instance of this is that their external claims on non-banks showed a marked rise between June 2014 and June 2015 at 6.3%. While increased lending to non-residents was accompanied by heightened

⁵ On the structural factors that influence banks' profitability, see Deutsche Bundesbank (2013) and (2014).

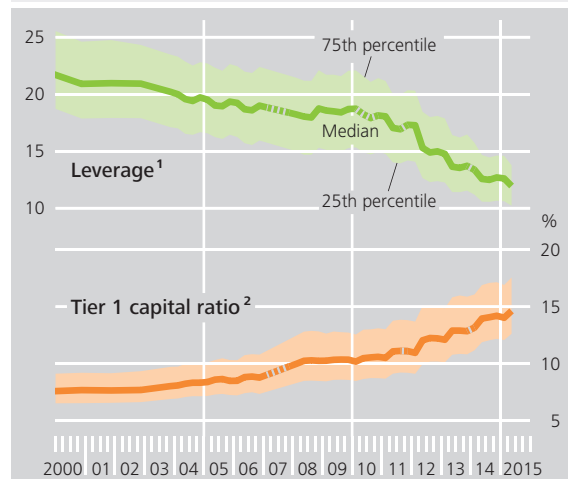
⁶ According to the ECB consolidated banking data, the return on total assets of banks in the European Union (euro area) in the first half of 2014 amounted to 0.33% (0.25%).

⁷ According to the ECB consolidated banking data, the average tier 1 capital ratio of large banks in the European Union (euro area) in the first half of 2014 amounted to 12.97% (12.66%). In Germany, it was slightly above this average in mid-2015 at 14.6%.

Leverage and tier 1 capital ratio of all banks in Germany*

Chart 1.2.1

Up to 2003, annual data; from 2004, quarterly data



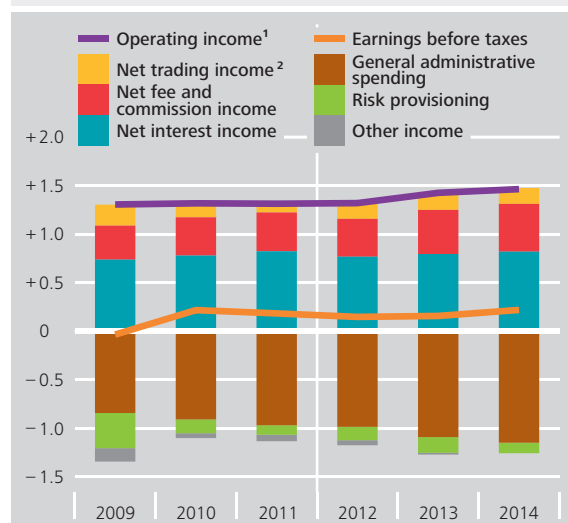
Source: Bundesbank calculations based on individual institution and group reports. * Revised valuations of tier 1 capital and risk-weighted assets apply as of 2007, 2011 and 2014 due to the EU Capital Requirements Directives CRD II, CRD III and CRD IV, respectively. **1** Total assets as a multiple of tier 1 capital; 2010 transition period pursuant to the Act Modernising Accounting Law (Bilanzrechtsmodernisierungsgesetz). Linear interpolation of leverage and tier 1 capital ratio in 2007. **2** Tier 1 capital in relation to risk-weighted assets.

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Profit components of selected banks*

Chart 1.2.2

As a percentage of total assets



Sources: Corporate data and Bundesbank calculations. * Comprises IFRS data of 11 of the 12 major German banks with an international focus which did not transfer positions to resolution agencies in the observation period. **1** Sum of net interest income, net fee and commission income and net trading income. **2** Including income from financial assets carried at fair value.

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Average risk weights* of selected categories of banks in Germany

Table 1.2.1

Weighted mean values in %, annual changes in percentage points, as at June 2015

Categories of banks	Average risk weights by exposure class												Memo item Share of standardised approach in entire portfolio	
	Total		Sovereigns		Banks		Enterprises		Retail business		Other finan- cial assets/ exposures			
		Change		Change		Change		Change		Change		Change		Change
Selected banks ¹	25	+ 0	5	+ 0	15	+ 0	44	- 2	23	- 1	17	- 0	28	- 3
Savings banks	46	- 2	1	- 0	4	+ 0	94	- 1	68	- 4	35	- 0	99	- 0
Cooperative banks	48	+ 0	1	+ 0	8	+ 0	92	- 0	61	- 2	42	- 1	95	+ 0

* The average risk weight within a single exposure class is defined as the ratio of risk-weighted assets to the matching exposures after credit risk mitigation. ¹ 12 major German banks with an international focus which had not transferred positions to resolution agencies at the time of observation.

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risk-taking in the run-up to the financial crisis, there are no obvious signs of this at present. It is true that there has been an increase in exposures to emerging market economies of late. However, the banks have reduced their exposures to the euro-area countries that were particularly affected by the debt crisis.

One indication of the risk taken by the major banks is provided by the risk content of the balance sheet, although this captures systemic risks only to a limited extent. The risk content is defined as the ratio of risk-weighted assets to total assets. This indicator stood almost unchanged at 29% in June 2015 and therefore does not point to heightened risk-taking. Even a close analysis of the risks contained in the exposure classes reveals hardly any changes in the risk propensity of the group of major banks (see Table 1.2.1). In retail business as well as in the funding of enterprises, it is even possible to note slight falls in the average risk weights.

In comparison with savings banks and cooperative banks, the major banks' balance sheets show a smaller risk content. This can be explained, first, by the differing business models. The major banks are, for example, more active in the interbank market

and operate only on a smaller scale in the financing of households and small and medium-sized enterprises. Since the credit assessment for small and medium-sized enterprises is mostly somewhat less favourable than it is for large firms and banks, higher risk weights are often assigned to the relevant exposures. Second, the major banks make greater use of internal models for calculating their risk-weighted assets. This risk measurement generally results in lower values for the risk assets.

The major German banks increased their tier 1 capital ratio to 14.6% at the end of the period under review. On account of weak profitability, they were able to retain profits only to a minor extent. They therefore strengthened their common equity tier 1 capital primarily by issuing new shares. As a result of the improvement in their capital position, their leverage ratio was kept nearly constant at 23.6 in the period from September 2014 to June 2015. The resilience of the major German banks with an international focus was thus strengthened overall.

The major German banks increased their tier 1 capital ratio to 14.6% at the end of the period under review.

Earnings of the savings banks and cooperative banks still stable

The stability of the German banking system is closely linked to the resilience of the savings banks and the cooperative banks as a whole.

So far, the low-interest-rate environment is having hardly any impact on the primary institutions' profitability. The savings banks and credit cooperatives were thus able to increase their operating income slightly in 2014 (+0.8% and +0.2%, respectively).⁸ Net interest income rose, in fact, albeit only marginally (+0.5% and +1.0%, respectively). The institutions were able to offset the decline in the interest margin, ie the ratio of net interest income to total assets, in particular by stepping up lending. Shifting customer deposits towards transferable deposits bearing a lower rate of interest likewise supported net interest income.

Since maturities in lending business were also expanded at the same time, interest rate risks also increased. From a macroprudential perspective, such risks are significant because interest shocks hit all institutions simultaneously. Interest rate risks can

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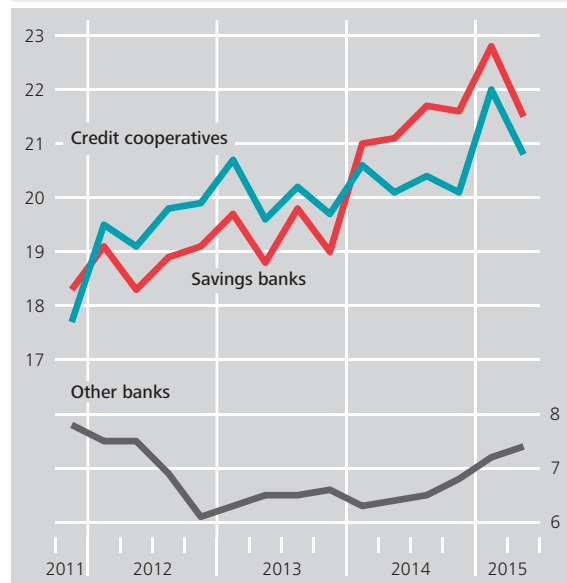
be measured using the Basel interest rate risk coefficient. This interest rate risk coefficient is defined as a present-value loss (relative to own funds) resulting from an abrupt

rise (or fall) in interest rates of 200 basis points across all maturities. It also comprises the off-balance-sheet instruments in the non-trading book. In the case of the savings banks, in the period from end-2011 to mid-2015, the Basel coefficient went up from 18.3% to 21.5%.⁹ During the same period, the cooperative banks' coefficient rose by 3.1 percentage points to 20.8% (see Chart 1.2.3). Given a coefficient above 20%, a heightened

Comparison of interest rate risk coefficients*

Chart 1.2.3

Mean values in %



* The interest rate risk coefficient measures the present-value loss resulting from an abrupt rise (or fall) in interest rates of 200 basis points across all maturities relative to the regulatory own funds.

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interest rate risk is assumed by the banking supervisors.

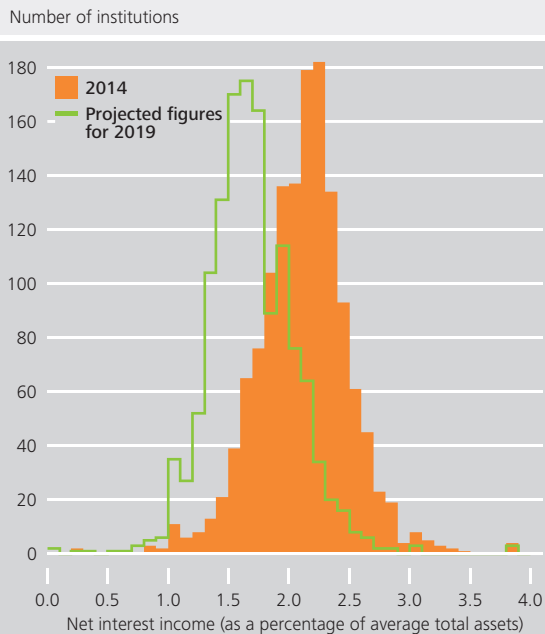
Sharp reduction in the net interest margin expected by 2019

According to the survey on the impact of the low-interest-rate environment, many savings banks and

⁸ A more detailed analysis of profitability in the German banking sector may be found in Deutsche Bundesbank (2015b).

⁹ These calculations are based on the amended Circular 11/2011 (BA) of the Federal Financial Supervisory Authority (BaFin) on the prudential treatment of interest rate risk in the non-trading book. Two scenarios are considered: a parallel upward shift of 200 basis points in the yield curve (scenario 1) and a parallel downward shift of 200 basis points in the yield curve (scenario 2). Only institutions which show a negative change in the risk contribution in at least one of the two scenarios are included in the calculation. If both figures are negative, the larger figure is used. As, in almost all cases, the lower figure appears in scenario 1, the results can be viewed as an approximation of the scenario of a parallel upward shift of 200 basis points in the yield curve.

Distribution of net interest income of savings banks and cooperative banks Chart 1.2.4



Sources: Financial statements of the institutions and Bundesbank survey on the low-interest-rate environment.
 Deutsche Bundesbank

cooperative banks are expecting their net interest margin to fall considerably by 2019. This becomes obvious when comparing the distribution of the interest margin in 2014 with its distribution in line with the institutions' own projections for 2019. The leftward shift of the distribution indicates a systematic deterioration of the net interest margin in the savings bank and cooperative bank sector on account of the low-interest-rate environment (see Chart 1.2.4).

Moreover, a deterioration in the currently positive net valuation result in the wake of a slowdown in economic activity could place a strain on the performance of savings banks and cooperative banks. In recent years, the low costs of credit risk provisioning have been a mainstay of the profitability of the primary institutions, ie savings banks and credit cooperatives.

Little indication of heightened risk-taking by the primary institutions

Risks to the stability of the financial system might arise if the primary institutions respond to potentially poorer profitability in a similar fashion. If the institutions relax their credit standards in an attempt to grant more loans in the low-interest-rate environment, they would be hit simultaneously by a deterioration in economic activity.

An easing of credit standards in the case of loans for house purchase, in particular, poses a potential risk to the stability of the banking system, given that crises in the past were often triggered by price exaggerations on the real estate markets as a result of a sharp expansion in lending activity.¹⁰

Current data show no indication of increased risk-taking in lending by savings banks and cooperative banks.¹¹

Current data show no indication of increased risk-taking in lending by savings banks and cooperative banks.

While these banks have clearly granted more loans to households for house purchase, the average risk weight in retail banking, which comprises lending to private customers, fell in 2014. In the case of savings banks, the figure was down 4 percentage points to 68% (see Table 1.2.1 on page 32). For cooperative banks, the relevant figure dropped by 2 percentage points to 61%. According to the survey on the impact of the low-interest-rate environment, one-quarter of all savings banks and cooperative banks intend to adjust their credit standards if the low-interest-rate environment persists.

¹⁰ In June, the German Financial Stability Committee recommended that the Federal Government create a legal basis to allow macroprudential regulation of the property financing business owing to the importance of the real estate markets for financial stability. See the chapter entitled "Macroprudential policy" on pp 71-83.

¹¹ See the chapter entitled "The macroeconomic and financial environment" on pp 17-27.

There are signs of heightened risk-taking in the securities in the liquidity reserve, as average residual maturities have been extended and investment in riskier products has taken place. Overall, the liquidity reserve accounts for approximately 20% of the aggregate total assets of the institutions participating in the survey.

Resilience of savings banks and cooperative banks still adequate

Last year, the savings banks and cooperative banks were able to increase their tier 1 capital ratio to 15% and 14.2%, respectively, on account of relatively good earnings. According to the survey, the institutions, on aggregate, are planning to build up further tier 1 capital in the coming years despite the expectation of diminishing income. This is intended to be achieved chiefly through the retention of profits. In view of the expected decline in interest income and a possible deterioration in the net valuation result, the institutions' assumptions may prove to be too optimistic in this respect. If the savings banks and cooperative banks, as in the past, release hidden reserves in order to smooth profits, this might also weaken the institutions' resilience over the medium term.¹²

Macro stress tests expose vulnerabilities

If banks, in light of the persistent low-interest-rate environment, are unable to build up enough equity capital in future or if they release reserves to smooth their income, they will be more vulnerable to macroeconomic shocks. The effects of such shocks on the profitability and solvency of German banks can be estimated using macro stress tests.

In an integrated stress test for the German banking system, the Bundesbank simulated the simultane-

ous occurrence of multiple macroeconomic events over a three-year horizon (2015 to 2017).¹³ The stress scenario depicts an extreme macroeconomic event and covers an abrupt rise in short-term interest rates, a major stock market correction, a slump in real economic activity and a significant decline in real estate prices. With this scenario, it is possible to roughly quantify the effects of extremely negative macroeconomic events on banks' solvency and to estimate potential implications for the stability of the banking system.

In an integrated stress test for the German banking system, the Bundesbank simulated the simultaneous occurrence of multiple macroeconomic events.

Specifically, this stress test assumes that the cumulative gross domestic product over the three-year horizon falls by up to 9.3% against the baseline scenario, which is based on the Bundesbank's projections. At the same time, short-term interest rates peak at 4.4% and long-term interest rates peak at 1.2%. Share prices and real estate prices slump by up to 44% and 17%, respectively.¹⁴ A more detailed description of the impact of these variables on the simulated losses of the real estate financing portfolio may be found in the box entitled "Stress test for residential mortgage loans to households in Germany" on pages 37 and 38. The results of the macro stress test show that the average annual profit of the small and medium-sized banks drops by 91% at its most extreme (see Chart 1.2.5). Almost half of the institutions post a negative pre-tax result in this extreme scenario. The large banks, too, have to

¹² S Bornemann, T Kick, C Memmel and A Pfingsten (2012), for example, show that, between 1997 and 2009, German banks made intensive use of reserves pursuant to section 340f of the German Commercial Code in order to avoid a net loss or a year-on-year fall in their net profits.

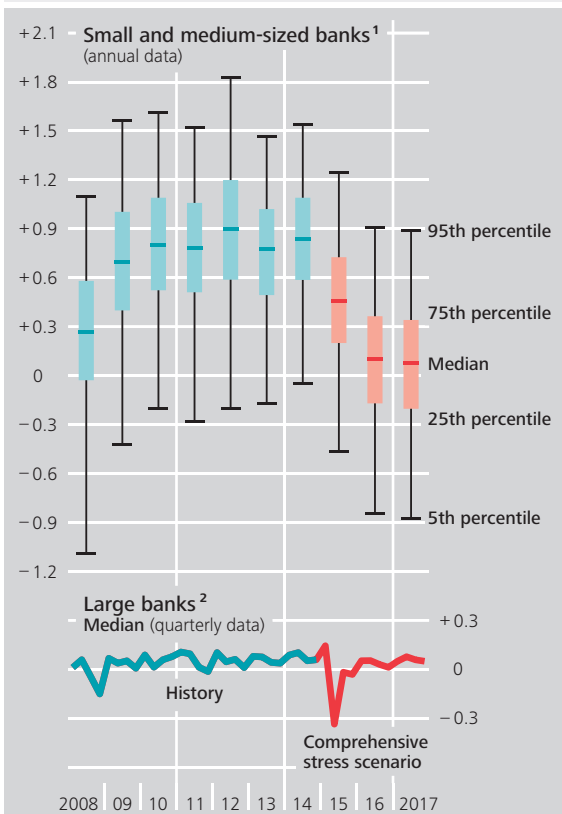
¹³ A top-down stress test was used in this instance. The calculations were performed centrally by the Bundesbank on the basis of balance sheet and prudential reporting data.

¹⁴ Including an additional price drop of 5% for the aggregate of seven large cities.

**Integrated stress test:^{*}
 earnings before taxes**

Chart 1.2.5

As a percentage of total assets



^{*} This stress scenario covers the simultaneous occurrence of multiple negative macroeconomic events. **1** Commercial banks, savings banks and cooperative banks. **2** 12 major German banks with an international focus which did not transfer positions to resolution agencies in the observation period.

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absorb considerable losses, which even exceed the level in the crisis year of 2008. The slump in profits mainly arises on account of losses in the banks' trading business as well as an increase in value adjustments in their lending business. Owing to good capitalisation, however, none of the large institutions runs into difficulties.

When interpreting the results, it should be noted that the stress tests used do not take into account a number of important aspects. Liquidity risk, a major systemic risk, deserves particular mention in this respect. This materialises, for example, when a

bank runs into difficulties and creditors withdraw their funds or do not renew their loans, even from and with banks that are not directly affected. In the financial crisis, this even led to the interbank market drying up. Feedback effects between the banking sector and the real sector are not taken into account by these models either. A shock in the real sector, for instance, may lead to a tightening of lending, further intensifying the economic downturn. This, in turn, can have further negative impacts on the banking sector. For these reasons, the results of the stress tests are more likely to represent the minimum level of what is to be expected in an adverse scenario.

Persistent low interest rates put pressure on earnings of building and loan associations

The current low-interest-rate environment presents particular challenges for the business models of some banks. The banks most affected are those with long-term fixed-rate commitments which are finding it difficult to generate sufficient returns in the low-interest-rate environment. This applies especially to building and loan associations.

However, the stability of the financial sector as a whole is unlikely to be fundamentally jeopardised by the difficulties of the building and loan associations, as this sector is small, accounting for 2.6% of the aggregate total assets of all German banks, and its interconnectedness with other parts of the banking system is low.

The building and loan associations show a strong reliance on lending and deposit business. A narrowing of the net interest margin triggered by sinking interest rates thus has a considerable impact on their profitability.¹⁵ When interest rates fall, the building

¹⁵ See M Köhler (2015) for an analysis of the profitability of building and loan associations and factors affecting it.

Stress test for residential mortgage loans to households in Germany

An *ad hoc* real estate shock was simulated in the 2014 *Financial Stability Review* for the 116 institutions that participated in a special survey.¹ The losses calculated for the granted residential mortgage loans were subsequently extrapolated for the entire banking system. The losses of each individual German bank have now been modelled in the integrated stress test (see pages 35 to 36), taking account of the standard macroeconomic scenarios.²

The expected loss (*EL*) for each bank's mortgage loan portfolio in year *T* is calculated as the weighted product of the probabilities of default (*PD*) and the loss given default (*LGD*), which is estimated for loans of vintage *t* with loan-to-mortgage lending value ratio *K*.

$$EL_T = \sum_{t,K} w_T^{t,K} PD_T LGD_T^{t,K}$$

The weighting $w_T^{t,K}$ corresponds to the estimated *pro rata* volume of loans outstanding. The *LGD* is estimated using the recovery rate (*Rec*),

which is the ratio of the current selling price of the property to the outstanding loan amount.

$$1 - LGD_T^{t,K} = Rec_T^{t,K} = \min \left\{ 1; \frac{(1 + \Delta p_{t,T})(1 - \Delta f_T)}{LTV_K(1 - Amort_{t,T})} \right\}$$

$\Delta p_{t,T}$ corresponds to the percentage rise in real estate prices since the time the loan was granted and Δf_T equates to the percentage discount on the property's market price in the case of foreclosure.³ The denominator shows the average initial loan-to-market value of a property (*LTV*)⁴ in mortgage lending value class *K* and the part of the loan that has not yet been amortised ($1 - Amort_{t,T}$).

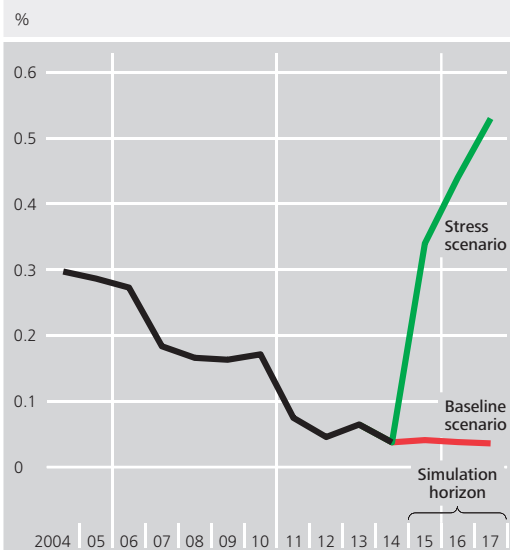
1 See Deutsche Bundesbank (2014), *Financial Stability Review*, November 2014, pp 57-68.

2 The estimated losses only refer to residential mortgage loans to households. The analysis included all banks with outstanding residential mortgage loans of more than €5 million in 2014. Information on outstanding residential mortgage loans was taken from the borrowers statistics. Data on new business and on the loan-to-mortgage lending value ratio were estimated on the basis of MFI interest rate statistics and the special survey on residential real estate.

3 A distinction is made between three regions: large cities (seven), urban areas (17 remaining towns and cities from the special survey on residential real estate) and all other regions. When modelling the *LGD*, it should also be noted that claims of building and loan associations are generally entered in the Land Register on a subordinate basis.

4 A haircut is applied to the loan-to-mortgage lending value ratio to calculate the *LTV*: $BelA_K \cdot LTV_K = (1 - \Delta B) BelA_K$.

Historical loan loss provision ratio and expected losses over the simulation horizon*



* Loan loss provisions on residential mortgage loans to households in relation to total outstanding residential mortgage loans. Up until 2014: all banks. Simulation from 2015: all banks with outstanding residential mortgage loans to households of more than €5 million.

The modelled probability of default is based on the banks' recent estimate of probability of default plus a simulated effect of increasing unemployment in the adverse shock scenario.⁵

In the baseline scenario, which perpetuates the current economic development, the expected loss remains at the current very low level. It rises to up to 0.53% in the stress scenario, however.

This equates to an increase in the aggregated provisioning needs from €0.4 billion currently to up to €5.5 billion per year, which corresponds to a 0.7 percentage point decline in the median tier 1 capital ratio over the three-year simulation horizon. The isolated real estate scenario does not lead to any of the banks included in the simulation undershooting capital requirements, though.

⁵ Due to a lack of data, it is assumed that the probability of default is independent of loan class *K*, which possibly leads to an underestimation of expected losses.

Building and loan associations show a strong reliance on lending and deposit business. A narrowing of the net interest margin triggered by sinking interest rates thus has a considerable impact on their profitability.

and loan associations have to pay interest on the long-term deposits under savings and loan contracts that is above the current rate. However, they can only invest funds at the current interest rate, which they achieve, for example,

by temporarily granting a limited amount of interim and bridging loans.

Finally, falling interest rates cause savers with building and loan associations to refrain from drawing on fixed-rate building loans, while at the same time accumulating more deposits. As a result, the ratio of building loans to deposits under savings and loan contracts is reduced. The building and loan asso-

ciations therefore have more free collective funds at their disposal when interest rates drop; however, they are only able to invest these at low interest rates in the context of interim and bridging loan business.

Against this backdrop, a scenario analysis was used to investigate changes in the net interest income of building and loan associations in three different interest rate scenarios over a period of ten years (see Chart 1.2.6). The scenarios model future developments in the long-term interest rate level (Bunds with a ten-year residual maturity). The baseline scenario corresponds to market expectations and was derived from the implied forward rates.

The baseline scenario assumes the interest rate level continues to decline until 2016 before rising slightly. Here, the net interest margin narrows significantly

at first. However, if interest rates go up from 2017, the net interest margin widens again slightly.

Scenario 1 assumes a persistent low-interest-rate environment in which the long-term interest rate level remains at zero. In this scenario, the net interest margin contracts considerably and also stays at a low level of around 1.4% in the subsequent years.

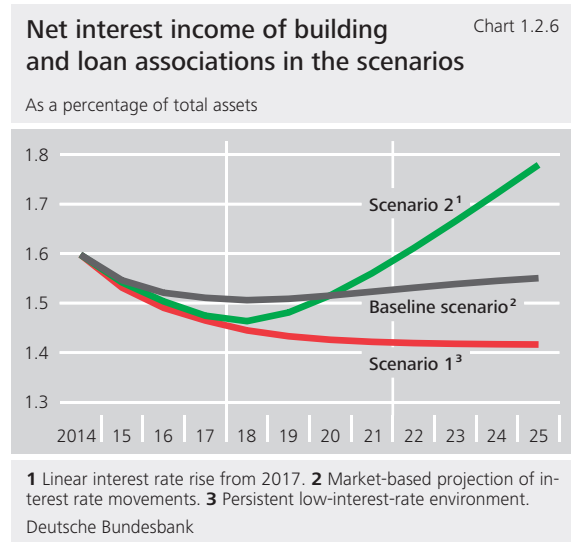
Scenario 2 assumes that the interest rate level initially continues to fall and then climbs linearly from 2017 onwards. Based on these assumptions, the net interest margin expands again from 2018.

When interpreting these results, it should be noted that projections over the long horizon assumed here are subject to considerable uncertainty. The scenario analyses conducted therefore serve more as a qualitative illustration of the impacts of the observed scenarios rather than as a precise computation of future net interest income.

Nevertheless, the results show that if the interest rate level does not return to normal, the profitability of building and loan associations is likely to remain strained.

If the interest rate level does not return to normal, the profitability of building and loan associations is likely to remain strained.

In order to manage in future with a lower interest rate margin, building and loan associations are likely to endeavour to reduce their costs. The fact that their cost-income ratio has barely improved over the past decade suggests that there is still potential for cutting costs.



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■ Risks in the life insurance sector

Two developments have shaped the risk situation and resilience of German life insurers of late. First, interest income from investment has fallen more rapidly than interest expenditure on long-term policies concluded with policyholders. Second, the Life Insurance Reform Act (Lebensversicherungsreformgesetz), which entered into force in August 2014, has reined in the outflow of funds from insurance companies. The findings of a scenario analysis covering a forecast period from 2015 to 2025 reveal that, despite the considerable relief offered by the Life Insurance Reform Act, the prolonged low-interest-rate environment will continue to put pressure on German life insurers and may jeopardise their solvency situation. In the most severe scenario of a stress test conducted by the Bundesbank, life insurers would have a capital shortfall equivalent to 10% of own funds. They are, therefore, facing the ongoing challenge of further boosting their resilience. This is especially important given that the new prudential regime, Solvency II, will impose higher capital requirements on insurance companies as of 2016.

Life insurers have responded to the changing environment by extending the duration of their portfolios. They have done so partly in preparation for Solvency II. The longer maturity of their assets has reduced the duration gap between very long-term liabilities and shorter-term assets and, with that, the insurance companies' vulnerability to long-term capital market risk. At the same time, however, it has made insurers more sensitive to an abrupt rise in interest rates.

If individual or multiple insurance companies were to become distressed, the potential contagion risks for the financial system would be smaller than in the case of banks. For one thing, the insurance sector's intrasectoral links are of only minor importance. For another, insurers' funding is less volatile than that of banks, which are very much dependent on the interbank market. Nevertheless, risks in the insurance sector can impair financial stability and adversely affect the real economy.

Low-interest-rate environment is impairing resilience

Insurance companies perform a core function in terms of financial stability by enabling risk allocation and risk protection in the financial system. They play a key role in the financial markets. Like

Insurance companies perform a core function in terms of financial stability by enabling risk allocation and risk protection.

banks, they invest in the financial system and the real economy. Unlike banks, however, insurers' characteristic business activities involve providing policyholders with cover against risk. Insurers obtain the majority of their funding through policyholders' premium payments and lend each other funds only to a very limited extent. By contrast, intrasectoral links play a pivotal role for banks, as the interbank market is an important source of funding. Insurers' funding is, thus, in principle less volatile than that of banks. In this respect, the potential contagion risks for the financial system in the event of individual or multiple insurance companies becoming distressed are smaller than when banks run into difficulties.

Insurance companies' distress can, nevertheless, impact financial stability and the real economy through various transmission channels. It can affect banks directly, as insurers are an important source of funding for them. In mid-2015, German insurers held 37% of their total investment in the banking sector. This interconnectedness and the risks resulting from it have diminished perceptibly in the wake of the financial crisis. At the end of 2011, this share of the insurers' investment portfolio had still amounted to 47%. Studies bear out that the systemic importance of insurers has lessened since the crisis.¹

Moreover, shocks that hit either the assets side or the liabilities side of insurers' balance sheets can also trigger indirect contagion effects. For instance, the liquidation of investments may lead to negative market price effects (liquidation channel). Ultimately, insurer distress can cast doubt on the stability of banks and other financial intermediaries (confidence channel).²

Life insurers hit particularly hard

In contrast to banks, insurance companies' portfolios contain liabilities with significantly longer maturities than those of their assets. Insurers encounter distress when the income

generated from investment is not sufficient to fulfil their long-term commitments. This is particularly relevant for German life insurance companies as, in

Insurers encounter distress when the income from investment is not sufficient to fulfil their long-term commitments.

the past, they engaged especially in products with fixed guaranteed interest rates. The interest obligations under their long-term insurance portfolios are thus still very high and are declining only gradually owing to the long-term structure of their benefit commitments to policyholders (see Chart 1.3.1). The average maximum technical interest rate in life insurers' portfolios, which mostly reflects the contractually guaranteed return and accounts for the largest portion of the current return, fell by only three basis points to 3.05% in 2014.³ It is, thus, coming into line with the lower general interest rate level only with some delay.

¹ See Deutsche Bundesbank (2014b), pp 67-75, as well as N Podlich and M Wedow (2013).

² For more information on the systemic importance and crucial functions of insurers, see Deutsche Bundesbank (2013), pp 81-85, Deutsche Bundesbank (2014b), pp 67-75, and Bank of England (2015).

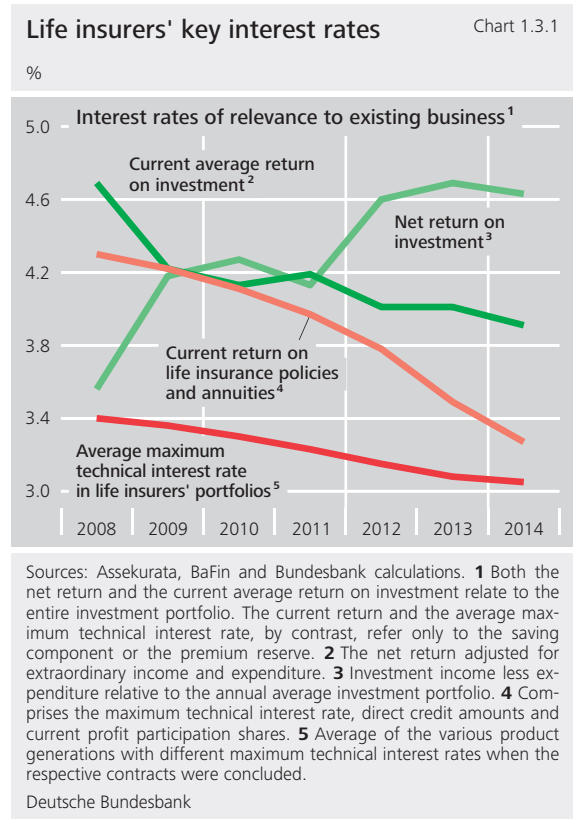
³ For more information on the return metrics used in insurance business, see Deutsche Bundesbank (2014c), p 53.

The net return on investment is one indicator of life insurers' investment policy. In 2014, it decreased slightly to 4.63% (compared with 4.69% in 2013). However, focusing solely on this indicator paints an overly positive picture of life insurance companies' earnings position and prospects as, in 2014, like in previous years, life insurers realised valuation reserves on a large scale, not least to build up additional interest provisions.⁴ Moreover, there were write-ups on securities remaining in the portfolio. Both developments raised the net return. Valuation gains are not sustainable going forward, however. The current average return on investment is an indicator which covers only current income and expenditure in relation to investment without taking valuation gains into account. It has fallen steadily over the past years and, at around 3.9%, was significantly lower than the net return on investment in 2014.

Allowance should be made for hidden reserves and hidden losses

The question of how well equipped life insurers are to deal with the challenges posed by the low-interest-rate environment depends on their resilience, for which the coverage ratio is a regulatory yardstick. The coverage ratio is the ratio of own funds to regulatory own funds requirements. It must be at least 100% to fulfil the regulatory requirements under the Solvency I regime. In 2014, the coverage ratio of German life insurance companies was, in aggregate, 163% and, thus, well above 100% (see Chart 1.3.2). The informative value of the coverage ratio is, however, limited as it makes no allowance either for hidden reserves on the assets side or for hidden losses on the liabilities side. This is particularly relevant in the prevailing low-interest-rate environment.

German legislators introduced the additional interest provision in 2011 to factor in parts of the hidden losses. Under the additional interest provision,

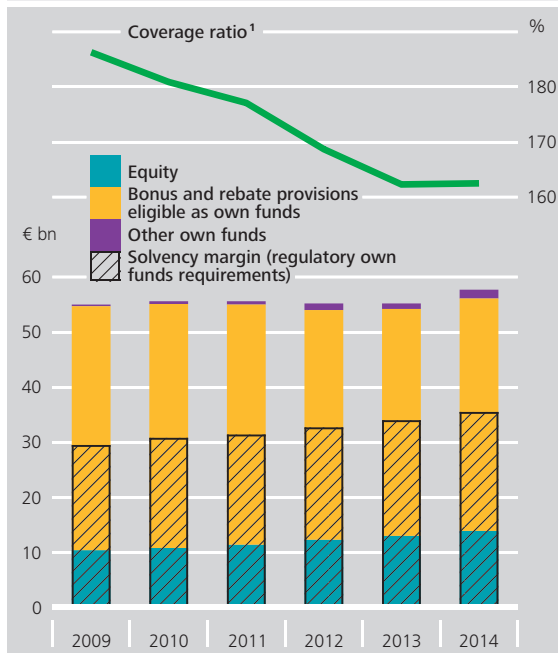


supplementary reserves are built up gradually to enable insurers to fulfil their commitments to policyholders even during a prolonged period of low interest rates. This results in lower reported profits. Thus, the additional interest provision ensures that fewer funds are paid out and that more funds are retained by the companies, instead.

Under the additional interest provision, supplementary reserves are built up to enable life insurers to fulfil their commitments to policyholders even during a prolonged period of low interest rates.

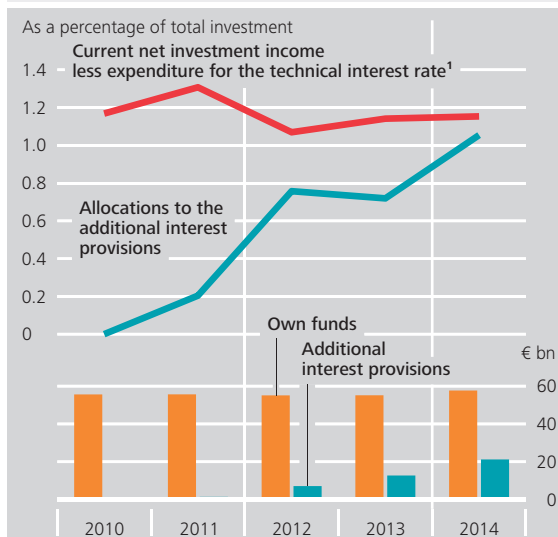
⁴ The additional interest provision is a constituent part of the premium reserve which companies must put in place for policies for which the reference interest rate – derived from the ten-year average of yields on zero-coupon euro interest rate swaps with a maturity of ten years – is lower than the original technical interest rate of relevance for the premium reserves.

Life insurers' own funds Chart 1.3.2



Source: BaFin. **1** Ratio of own funds to the solvency margin.
 Deutsche Bundesbank

Growth of additional interest provisions Chart 1.3.3



Sources: BaFin and Bundesbank calculations. **1** Difference between current net investment income, adjusted for extraordinary income and expenditure, and expenditure to finance the technical interest rate in relation to the premium reserves. Current net investment income does not include income from specialised investment funds.
 Deutsche Bundesbank

It should, in principle, also be taken into account when assessing resilience. In 2014, additional interest provisions grew by €8.5 billion year-on-year and now total €21 billion, compared with insurers' own funds amounting to €58 billion (see Chart 1.3.3). The additional interest provision internalises only parts of the hidden losses, though. This is mainly attributable to the fact that the discount rate which applies to life insurers' future liabilities is not based on the current market interest rate but rather on a moving average of earlier, higher market interest rates.

Coverage ratio can overstate resilience

To interpret developments in life insurance companies' own funds, it makes sense to calculate an adjusted metric for resilience which makes allowance for all hidden losses and hidden reserves. This adjusted metric for resilience expresses the sum of own funds and valuation reserves (hidden reserves) less hidden losses over own funds requirements.

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In this article, the metric is calculated with the aid of data collected from life insurers by the Federal Financial Supervisory Authority (*Bundesanstalt für Finanzdienstleistungsaufsicht* or BaFin) as part of its extended forecast. In this forecast, insurers are asked to provide data on their hidden reserves and hidden losses assuming that the market interest rate remains constant. These data, gathered for prudential supervisory purposes, can be used to calculate a fair value-oriented coverage ratio for the insurance sector to demonstrate the strains arising for the sector from the low-interest-rate environment.

The valuation reserves of German life insurers' investments amounted to, in the aggregate, €136 billion at the end of 2014. This is equivalent to 14% of the market value of their investments. The hidden losses equate to the amount needed to safeguard the interests of continuing policyholders (*Sicherungsbedarf*).⁵ At the end of 2014, this amount stood at €152 billion in the aggregate or 16% of the fair value of the premium reserves.

This metric for resilience stood at an aggregate 98% in 2014, ie significantly less than the coverage ratio of 163%, thus indicating a lower level of resilience. This reflects the fact that the hidden losses remaining are greater than the hidden reserves. The reason

In a low-interest-rate environment, the amount needed to safeguard the interests of continuing policyholders tends to be greater than the hidden reserves.

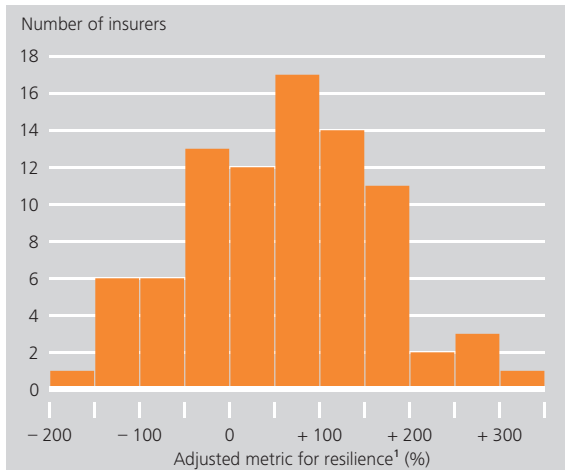
for this is that maturities on the liabilities side of the balance sheet are traditionally longer than on the assets side. A longer maturity implies a higher degree of

sensitivity to interest rate changes, with the result that hidden losses on the liabilities side respond much more strongly to changes in interest rates than do hidden reserves on the assets side. Therefore, in a low-interest-rate environment, the amount needed to safeguard the interests of continuing policyholders tends to be greater than the hidden reserves.

The adjusted metric for resilience differs considerably from one life insurer to another (see Chart 1.3.4). It is greater than 100% for just over one-third (36%) of life insurance companies. The net assets remaining exceed the own funds requirements at these companies. The adjusted metric for resilience at a further 34% of life insurers is between 0% and 100%. Although the value of this group of insurers' liabilities is smaller than their available funds, the net assets remaining would not be sufficient to fulfil the own funds requirements. In the case of 30%

Adjusted metric for resilience

Chart 1.3.4



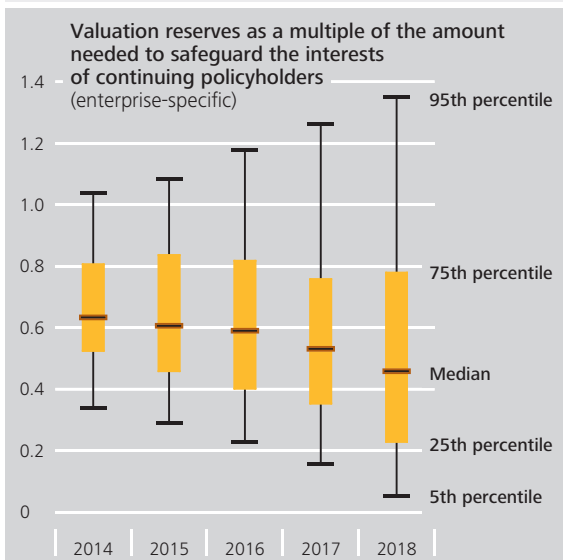
1 Ratio of adjusted own funds to adjusted own funds requirements in 2014. Adjusted own funds are calculated as the sum of own funds and valuation reserves less the amount needed to safeguard the interests of continuing policyholders. Adjusted own funds requirements are calculated as the regulatory own funds requirements plus 4% of the amount needed to safeguard the interests of continuing policyholders. All observations with a value of less than zero derive from an amount needed to safeguard the interests of continuing policyholders which is higher than the sum of own funds and valuation reserves. The analysis covered 86 German life insurance companies. Deutsche Bundesbank

of life insurance companies, own funds and hidden reserves altogether are less than the amount needed to safeguard the interests of continuing policyholders. At the current interest rate level, the value of these life insurers' liabilities including hidden losses is higher than the value of their assets including their valuation reserves.

The adjusted metric for resilience goes some way towards capturing a fair value-based coverage ratio. It illustrates the major challenges which life insurance companies are facing in the current low-interest-rate environment. As of 2016, insurers will have to calculate own funds requirements in a mar-

⁵ The amount needed to safeguard the interests of continuing policyholders is the difference between the premium reserve including the additional interest provision and the present value of an insurer's liabilities when discounting with the ten-year zero-coupon euro swap rate. It was laid down for the first time in the Life Insurance Reform Act.

Life insurers' valuation reserves of fixed-income securities Chart 1.3.5



Sources: BaFin and Bundesbank calculations. A score of less than 1 implies that the valuation reserves of fixed-income securities are not paid out to policyholders when policies lapse. The analysis covered 86 German life insurance companies.
 Deutsche Bundesbank

ket-consistent and risk-appropriate manner under the new Solvency II regulatory framework.⁶ Transitional

The own funds of almost half of all German life insurance companies would fall short of future requirements if Solvency II were to apply immediately without any transitional measures.

measures will still apply for the next 16 years, however. A comprehensive survey conducted by BaFin⁷ with regard to Solvency II found that the own funds of almost half of all German life insurance companies would fall short of

future requirements if the new prudential regime were to apply immediately without any transitional measures.

Solvency II has important macroprudential implications. A solvency balance sheet prepared largely according to market values is better able to cap-

ture future macroprudential strains arising from the low-interest-rate environment than one drawn up under the current prudential regime. However, marking to market also harbours the risk of increasing procyclical behaviour (see the box entitled "Solvency II from a macroprudential perspective" on pages 48 and 49).

Life Insurance Reform Act is reinforcing capital buffers

The Life Insurance Reform Act, which entered into force in August 2014, aims to strengthen German insurers' long-term resilience in a persistent low-interest-rate environment⁸ as, even after the introduction of the additional interest provision, hidden losses have remained

high. The Life Insurance Reform Act caps the outflow of funds from insurance com-

The Life Insurance Reform Act aims to strengthen resilience.

panies, thus boosting their capital reserves. Restrictions on dividend payments and on policyholders' participation in the valuation reserves when policies end are key elements of the Act. With the Life Insurance Reform Act in place, policyholders now participate in their respective valuation reserves of fixed-income securities only if the valuation reserves are greater than the amount needed to safeguard the interests of continuing policyholders.

According to BaFin's extended forecast, the aggregate amount needed to safeguard the interests of continuing policyholders considerably exceeded the aggregate valuation reserves of fixed-income

⁶ The Solvency II own funds requirements are derived from a complex, multi-level estimation process. Various scenarios are factored in, including stress scenarios. The resulting solvency metric is, therefore, not comparable with the adjusted metric for resilience in methodological terms.

⁷ See BaFin (2015).

⁸ See Deutsche Bundesbank (2014a) and Deutscher Bundestag (2014), p 1.

securities in 2014. Only 10% of life insurers had valuation reserves of fixed-income securities which were larger than the amount needed to safeguard the interests of continuing policyholders (see Chart 1.3.5). The forecast suggests that hidden losses will diminish as the additional interest provisions grow between 2015 and 2018, thus significantly cutting the aggregate amount needed to safeguard the interests of continuing policyholders. Nevertheless, the valuation reserves will shrink more quickly than the amount needed to safeguard the interests of continuing policyholders up to the year 2018. It is thus likely that, at least up to 2018, most life insurance companies will not have to give policyholders a share of the valuation reserves of fixed-income securities when policies end. They will still be allowed to participate in the valuation reserves of non-fixed-income securities.

The Life Insurance Reform Act has, all in all, significantly reduced the planned participation of policy-

The Life Insurance Reform Act has significantly reduced the planned participation of policyholders when policies end.

holders when policies end. In the aggregate, policyholders' participation is predicted to average €1.1 billion (2% of own funds) annually in the 2015 to 2017 period. One year earlier, life insurers had still given €2.6 billion (5% of own funds) as the expected participation share for the same period.

Restrictions on dividend payments to shareholders are another component of the Life Insurance

Profit transfers on the basis of intra-group profit transfer agreements are not affected by the Life Insurance Reform Act, however.

Reform Act. This moratorium on dividend payments takes effect where an extant amount is needed to safeguard the interests of continuing policyholders. In 2014,

therefore, most life insurance companies allocated their profit for the year to their revenue reserves. Profit transfers on the basis of intragroup profit transfer agreements are not affected by this legislation, however. Of 86 life insurers, 21 have such a profit transfer arrangement in place. These are principally the subsidiaries of listed insurance groups.⁹ Some life insurers did not actually conclude a profit transfer agreement with their parent company until 2014 with an eye to still being able to distribute profits. The original objective of the moratorium on dividend payments is thus being undermined in individual cases.¹⁰ In 2014, life insurers transferred a total of around €1 billion or 2% of their aggregate own funds to parent companies.¹¹

The original objective of the moratorium on dividend payments is thus being undermined in individual cases.

Scenario analysis reveals risks caused by persistently low interest rates

Stress tests and scenario analyses are two of the key tools used to assess the resilience of the insurance sector. Both analyse the impact of adverse scenarios on individual insurers' solvency situation. From a financial stability perspective, the most important developments are those which materialise at several insurers at the same time, adversely affect the insurance sector as a whole and have potential repercussions for other sectors of the financial system as well as for the real economy.

⁹ See Moody's (2014).

¹⁰ This is communicated accordingly in annual reports with reference to the Life Insurance Reform Act.

¹¹ Assekurata, the credit rating agency that specialises in insurance companies, expects profit transfer agreements to become more widespread in future. See Assekurata (2015).

Solvency II from a macroprudential perspective

Solvency II, a fundamental EU-wide reform of insurance supervision, will enter into effect in 2016.¹ Similar to the solvency regulations applying to the banking sector, the new regulatory framework will be structured around three pillars. It will contain new capital requirements (Pillar 1), provisions relating to insurers' governance and risk management (Pillar 2) and public disclosure and supervisory reporting requirements (Pillar 3). In place of the current risk-independent thresholds for investments under Solvency I, the new rules are centred on the valuation of assets and liabilities at market prices and the application of risk-based capital requirements to all quantifiable risks.

One of the macroprudential implications of Solvency II is that the risks arising from the low-interest-rate environment will become apparent at an earlier stage. However, the solvency balance sheet – which is largely based on market values – can also present a more volatile picture of insurers' resilience than that currently shown by Solvency I. This can have repercussions for insurers' investment policies and engender systemic risk. Insurers' attempts to increase their solvency ratio during crises, for instance, can lead to fire sales, which might further accelerate the fall in asset prices.

The explicit recognition of market risks in Solvency II can impact on insurers' investment behaviour. In future, more capital will have to be held against riskier investments than against less risky investments. That said, the market risk of a given investment will be recognised not just in isolation but also in relation to the other investments making up that portfolio, any expected liabilities and the balance sheet's loss-absorbing capacity. Insurers are thus incentivised to circumvent high-

er capital requirements by adapting their investment portfolios to take account of expected liabilities, for instance by modifying the duration of the investment or the degree of liquidity entailed. This can give rise to risks with respect to insurers' procyclical behaviour.²

To contain the risks arising from procyclicality, the Omnibus II Directive ushered in a set of measures assessing long-term guarantees (known as the "long-term guarantee package").³ This package features adjustments to the risk-free interest rate term structure as well as a 16-year transition period. Both measures determine the amount of provisions to be set aside for future obligations. The solvency ratio of German life insurers is sensitive to changes in the interest rate term structure due to their provision of very long-term return guarantees.

For liabilities with a maturity of more than 20 years, Solvency II prescribes the use of discount rates calculated on the basis of a long-term equi-

¹ As of 1 January 2016, insurance undertakings operating everywhere in the EU will be governed by Solvency II. Two EU directives make up this supreme legislative level: the Solvency II Framework (Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009) and the Omnibus II Directive (Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014). Solvency II was transposed into law in Germany by recasting the German Insurance Supervision Act (Versicherungsaufsichtsgesetz or VAG).

² For more information on the risks of procyclicality; see also Bank of England (2015), Quarterly Bulletin 2015 Q3, Insurance and financial stability, September 2015.

³ See Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014 (referred to as the Omnibus II Directive) and the written statement by the Deutsche Bundesbank for the public hearing of the Financial Committee of the Bundestag on 3 December 2014 regarding the Federal Government's "Draft Act to Modernise the Financial Supervision of Insurers" (Entwurf eines Gesetzes zur Modernisierung der Finanzaufsicht über Versicherungen).

librium interest rate (“ultimate forward rate” or UFR) of 4.2% using an extrapolation method.⁴ The UFR comprises an expected long-term inflation rate of 2% and an expected real interest rate of 2.2%. The Solvency II UFR thus lies well above the market expectations that prevailed in the autumn of 2015. Not least during a prolonged period of extremely low interest rates, the economic value of an insurance undertaking may fall below its value measured according to Solvency II.

The fact that the extended package of measures incorporating the Omnibus II Directive and the discount rates envisaged for use in the long-term segment will result in considerable, but possibly unsustainable, capital relief for insurers could prove critical from a financial stability perspective. Fulfilment of the solvency requirements set out in Solvency II ahead of schedule would make insurers more resilient. Disclosure, coupled with the resultant market transparency regarding transitional measures, is in any case likely to put insurers under pressure to comply with the aforementioned solvency requirements at an earlier stage. Moreover, it would be wise to make it obligatory to additionally disclose the sensitivity of the solvency ratios to a lower UFR than that applied at present (4.2%). This is currently not the case.

One significant exception to the principle of risk-based capital requirements is the preferential treatment of sovereign debt,⁵ for which the capital requirements do not take into account concentration and spread risks. Generally assigning a zero risk weighting to sovereign debt can skew the solvency ratio.

By giving sovereign bonds preferential treatment, Solvency II will set misguided incentives to invest more heavily in sovereign bonds, thus strengthening the nexus between insurers and sovereigns. Studies show that a given country’s risk of sovereign default substantially increases its domestic

insurers’ default risk.⁶ For this reason, it would be a welcome step if the preferential treatment of sovereign debt were discontinued and such instruments priced according to their actual credit risk instead. With respect to the Solvency II standard formula, every effort should be made to achieve this target when conducting the planned 2018 review of the methods, assumptions and standard parameters used to calculate the solvency capital requirement (SCR). Even at the early internal model approval stage, care should be taken to ensure that sufficient capital is being held against all types of risk, including sovereign risk. The European Systemic Risk Board (ESRB) estimates that abolishing the preferential treatment for sovereign bonds would increase the capital requirements for the EU insurance sector by anywhere between €35 billion and €80 billion, depending on the respective assumptions,⁷ or, on average, around 10% of the total SCR.

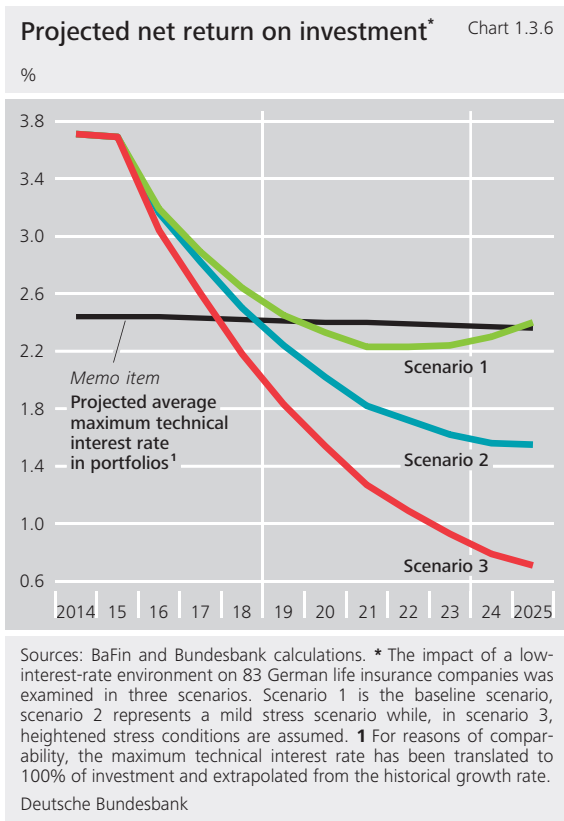
The same risk-based SCR should also be applied to other investment segments. For instance, calls to lower the capital requirements for individual investment categories – especially infrastructure investment and securitisation – should be viewed critically. Regulatory measures should not be used to achieve other economic policy objectives such as reinvigorating the securitisation market.

⁴ In the case of maturities of up to 20 years, market rates are applied for undertakings domiciled in the euro area. As regards longer maturities, the markets are less liquid. The longer the term, the less reliable market rates in this area are deemed to be. For details of the method used to calculate the risk-free interest rate term structure, see European Insurance and Occupational Pensions Authority (2015), Technical documentation of the methodology to derive EIOPA’s risk-free interest rate term structures, October 2015.

⁵ This relates particularly to euro-denominated sovereign bonds issued in the European Economic Area (EEA).

⁶ See R Düll, F König and J Ohls, (2015), On the exposure of insurance companies to sovereign risk – portfolio investments and market forces, Deutsche Bundesbank Discussion Paper No 34/2015, October 2015.

⁷ See European Systemic Risk Board (2015), ESRB report on the regulatory treatment of sovereign exposures, March 2015.



In the scenario analysis outlined here, three interest rate paths are generated for a ten-year period. Their respective effects on income and solvency in the life insurance sector over the same period are then examined.¹² The scenario analysis factors in both the measures introduced under the Life Insurance Reform Act and the lower interest rate level. The simulation of the coverage ratio is the main component of the model, with net investment income having the greatest influence on developments in own funds. Based on the current interest rate level, the net return on investment is simulated for three different low-interest-rate scenarios. The yield on German Federal bonds (Bunds) with a residual maturity of ten years forms the backbone of the scenarios. Enterprise-specific excess returns generated on fixed-income securities, variable-rate assets as well as property and real estate are then added.

In the baseline scenario (scenario 1), the net return is projected using forward interest rates derived from the yield curve for Bunds. The net yield is then calculated as the sum of the computed forward interest rates and the enterprise-specific excess returns. Over time, these excess returns shrink from their current level to the respective enterprise-specific historical mean.

The mild stress scenario (scenario 2) extrapolates the Bund yield using the value observed at the end of June 2015. The excess return is projected in the same way as in the baseline scenario. The more severe stress scenario (scenario 3) uses the same assumptions regarding the Bund yield as the mild stress scenario. However, the enterprise-specific excess returns are eroded to their historical minimum values in all areas. Chart 1.3.6 plots the resulting net return on investment for the aggregate of the life insurers analysed.

The findings of the updated scenario analysis are summarised in Chart 1.3.7. In the baseline scenario,¹³ one of the 83 life insurance companies analysed – for which sufficient data are available – will no longer meet the solvency requirements pursuant to Solvency I in 2025. In the mild stress scenario, seven life insurers have a coverage ratio

In the more severe scenario, the capital adequacy of a total of 21 life insurers, ie virtually every fourth enterprise analysed, would no longer be ensured by 2025.

¹² This distinguishes a scenario analysis from a stress test which, for instance, examines the impact only of a one-time change in interest rates. For more information on the methodology underlying the scenario analysis, see Deutsche Bundesbank (2013), pp 71 ff, as well as A Kablau and M Weiss (2014).

¹³ In comparison with the analysis conducted in 2013, even the baseline scenario forecasts instances in which the aggregate projected net return on investment is lower than the average guaranteed interest rate. In the model, the valuation reserves which are no longer to be paid out to policyholders remain with the enterprises, where they are allocated to own funds and thus enhance solvency.

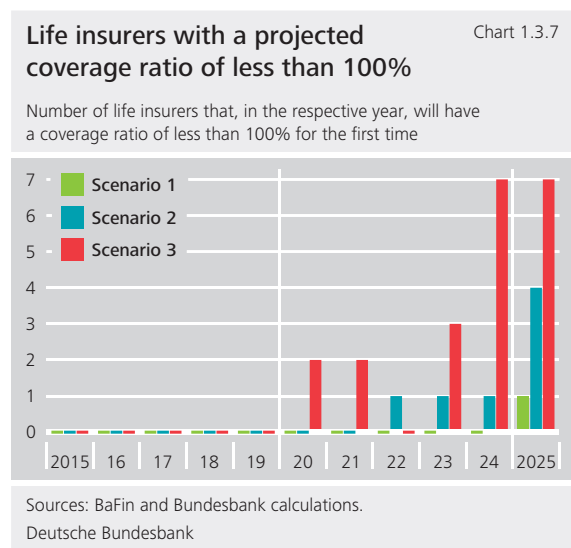
of less than 100% during the observation period. Measured in terms of their gross premium revenue, these enterprises hold a market share of around 6%. The capital shortfall amounts to about €1 billion or approximately 2% of own funds. In the more severe scenario, the capital adequacy of a total of 21 life insurers, ie roughly every fourth enterprise analysed, would no longer be ensured by 2025. These life insurance companies have a market share of about 35%. In this scenario, additional own funds of €5.5 billion would be required to ensure that all life insurers have a coverage ratio of 100% in 2025. This equates to around 10% of currently available own funds.

Without the adjustments provided by the Life Insurance Reform Act with regard to policyholders' participation in the valuation reserves, considerably more insurance companies would be at risk of not meeting the capital requirements. In the baseline scenario, for example, four insurers would have a coverage ratio of less than 100%. In the mild stress scenario, an additional 11 and, in the more severe scenario, an additional 18 insurers would fall short of the 100% requirement. In comparison with the analysis conducted in 2013, which was not yet able to factor in the Life Insurance Reform Act, there is an increase in the number of insurers not meeting the capital requirements as well as in capital needs in all three scenarios. This results from the projected net return being lower than in the previous analysis.

Like the adjusted metric for resilience described above, the scenario analysis illustrates that the prolonged low-interest-rate environment is continuing to put pressure on German life insurers and may jeopardise their solvency situation.

Abrupt hike in interest rates can destabilise

Persistently low interest rates are not the only factor that can jeopardise the stability of life insurance



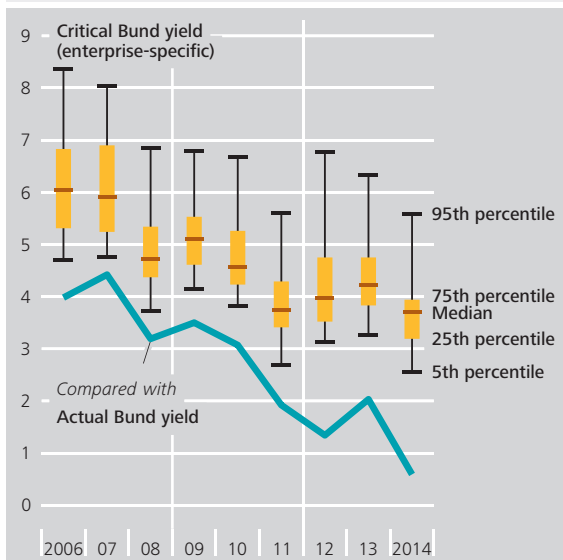
companies. An abrupt hike in interest rates would also pose risks.¹⁴ It could trigger an upsurge in policy lapses. While rising interest rates cause the fixed-income securities in life insurers' portfolios to lose value, the surrender values guaranteed to policyholders pursuant to section 169 of the Insurance Contract Act (*Versicherungsvertragsgesetz*) remain unchanged. In the event of policy lapses in this case, policyholders profit directly from the higher interest rates. If they maintain their policies, by comparison, they participate only in the life insurers' portfolio return, which is encumbered by legacy holdings of low-yielding securities.

If interest rates were to rise above enterprise-specific critical levels, the buffers between the market value of insurers' investments and surrender values would be fully depleted (see Chart 1.3.8). The market value of investments would then be so low that it would no longer be possible to fund payment obligations in full in the theoretical extreme case of a lapse in all policies.

¹⁴ For more information, see also Deutsche Bundesbank (2014c), pp 52 ff.

Critical interest rate level for life insurers given an upsurge in policy lapses* Chart 1.3.8

Year-end data (%)



* Yield on Bunds with a residual maturity of ten years, above which an upsurge in policy lapses could impair life insurers' stability. The analysis covered the approximately 60 largest German life insurance companies with a premium reserve of more than €1 billion each.
 Deutsche Bundesbank

Looking beyond the benefits of having insurance cover against biometric risks¹⁵ as well as the costs of a policy lapse (cancellation fees,¹⁶ loss of tax advantages etc), it may, in this case, be equally rational for any policyholder to lapse their life insurance policy.¹⁷

If interest rates were to rise above enterprise-specific critical levels, it may be equally rational for any policyholder to lapse their life insurance policy.

This holds true regardless of the guaranteed interest rate stipulated in the policies because, if policyholders with lower guaranteed commitments were to lapse their policies, it would also

no longer be attractive for policyholders with promises of higher guaranteed returns to keep their policies. The adjustment mechanisms within the community of policyholders stop functioning if there is a lack of funds to cover the surrender values. An upsurge in policy lapses may, therefore, ensue.

The enterprise-specific critical interest rate levels fell in general in the course of the financial crisis from around 5.9% (end-2007) to around 3.7% (end-2011) as the median for the larger German life insurance companies. After increasing slightly for a time, the critical interest rate level reverted to this median value in 2014. This decline is attributable predominantly to the fact that life insurers have extended the maturity of their fixed-income assets, meaning that the market values now respond more strongly to changes in interest rates. The relief provided by the Life Insurance Reform Act through reining in the outflow of funds from insurance companies and strengthening their buffers is smaller by comparison.

Market participants consider the scenario of an abrupt interest rate hike to be considerably less likely than that of persistently low interest rates.¹⁸ From a financial stability perspective, however, tail risks are also relevant.

Although it is rather improbable that they could arise, they would have a major impact on the financial system if they did. For instance, an interest rate shock could force insurers to liquidate investments, thereby causing asset prices to plummet. Under Solvency II, market value losses with regard to investments will come to light relatively quickly. It is possible that this could trigger a self-reinforcing procyclical effect. The

An upsurge in policy lapses could undermine confidence in the financial system as a whole. This risk hinges on fixed surrender values, as they are independent of the market interest rate.

¹⁵ Biometric risks are mortality, longevity and occupational disability risks.
¹⁶ In its more recent case law, the Federal Court of Justice (Bundesgerichtshof) declared certain contractual clauses on cancellation fees and surrender values to be invalid.
¹⁷ See M Feodoria and T Förstemann (2015).
¹⁸ Between 1972 and 2015, the highest year-on-year increase in the yield on Bunds with a residual maturity of ten years was 2.6 percentage points. Over a two-year period, the largest figure was 3.75 percentage points.

lapse scenario described here would become more likely in the event of interest rates rising abruptly. An upsurge in policy lapses could, furthermore, undermine confidence in the financial system as a whole. This risk hinges on fixed surrender values, as they are independent of the market interest rate. It would not exist if surrender values were sensitive to interest rate changes. Rising interest rates would then be accompanied by falling surrender values.

Investment policy shaped by search for yield and Solvency II

There are incentives to take greater risks in a low-interest-rate environment. Financial stability may be impaired if insurers contribute to a mispricing of risk because of earnings pressure.

The percentage of equities in the investment portfolios of German life insurance companies has increased: the share of direct and indirect holdings of equities in life insurers' total investment grew from 3.4% to 4.2% between the end of 2013 and

The percentage of equities in the investment portfolios of German life insurance companies has increased.

mid-2015.¹⁹ This percentage is small, however, also by international comparison. To this extent, insurers face limited risks from price losses on equity investments and can also achieve diversification effects. With this in mind, equities appear less risky with professional risk management practices in place than, say, large infrastructure investments, for which risk management requires considerable specialised technical know-how. German life insurers have also enlarged the share of corporate bonds in their investment portfolios: the percentage of corporate bonds held directly or indirectly in domestic specialised investment funds went up from 6.2% of total investment

at the end of 2013 to 8.2% in the second quarter of 2015. This in itself could be indicative of a search for yield.

From a macroprudential perspective, a shift in investment towards corporate sector assets could certainly be beneficial, as it may reduce the interconnectedness between the insurance sector and other sectors, such as the government sector or the banking sector.

A certain degree of risk-taking is discernible in investments in government paper. While the share of relatively low-yielding domestic public sector assets in German insurance groups' capital investment diminished from 10.5% at the end of 2013 to 9.5% in the second quarter of 2015,²⁰ the share of investments undertaken in sovereign issues from the rest of the euro area expanded from 11.6% to 12.9%. One reason for this could be the price gains on bonds issued by the countries hit especially hard by the financial crisis.

Even though German life insurers' exposure to corporate bonds and riskier government bonds has increased, the rating structure of the fixed-income assets that they hold showed a slight overall improvement in 2014 compared with the previous year.

Solvency II will change insurers' investment policy as a whole. The preferential treatment of sovereign bonds under the new prudential regime should be viewed critically. For instance, Solvency II exempts sovereign bonds issued by EU member states from capital requirements (see the box entitled "Solvency II from a macroprudential perspective" on pages 48 and 49).²¹ Under the new regulatory framework, insurers will have to back assets with

¹⁹ These figures are based on carrying amounts.

²⁰ According to BaFin surveys, based on fair values.

²¹ See R Düll, F König and J Ohls (2015).

capital commensurate with the risk involved. Insurers thus have an incentive to reduce their inter-

Under Solvency II, insurers will have to back assets with capital commensurate with the risk involved. Insurers are increasingly investing in long-dated bonds in order to close the gap between very long-term liabilities and shorter-term assets.

est rate risk and are increasingly investing in long-dated bonds in order to close the duration gap, ie the gap between very long-term liabilities and shorter-term assets. All in all, the modified duration of the bond portfolio rose to 10 in 2014

from 8.8 in 2013. At the end of 2011, the duration had still been 8.1.²² The duration gap has, thus, narrowed somewhat.

Risk management policies which are more duration-oriented could amplify interest rate movements. The duration gap widens when interest rates decline. To redress the balance, life insurers have to acquire additional fixed-income securities with long maturities. This causes the price of securities to rise, which leads to a further fall in long-term interest rates. A self-reinforcing effect may be produced.²³

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²² See Assekurata (2015).

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Risks in the German shadow banking system

The tightening of banking sector regulation since the financial crisis has created incentives to shift business into other areas of the financial system. Moreover, technological innovations can encourage growth in alternative forms of financing. The shadow banking system, in particular, conducts credit intermediation outside the regular banking and insurance sector. The crisis has shown that vulnerabilities with the potential to jeopardise the entire financial system can emerge in these areas.

The importance of the shadow banking sector within the German financial system has increased. In particular, the investment fund sector, which makes up the bulk of the German shadow banking sector, has been growing strongly for some years now. Factors in this growth are increases in the value of fund assets, but also net inflows from predominantly institutional investors. Rising concentration within this sector has the tendency to increase the systemic importance of the funds and their asset management companies, which, in turn, makes them more important to financial stability.

However, key risk indicators for the German fund sector are not pointing to higher risks. This may be explained, in part, by the regulation of investment funds by the German Investment Code (Kapitalanlagegesetzbuch). In addition, the growing importance of insurers and pension funds, with their more long-term focus, as shareholders of investment funds could have a stabilising effect.

Investment funds nonetheless remain at the centre of macroprudential debate. It is thus vital, on the one hand, to examine the interlinkages between and impact of deteriorating market liquidity and outflows from the fund sector on financial stability. On the other hand, regulatory changes, such as the authorisation for German funds to originate loans, make it necessary to continually enhance the monitoring framework.

Shadow banking sector growing dynamically and changing its structure

Banking sector regulation was tightened in response to the financial crisis, creating incentives to shift business into other areas of the financial system. Technological innovations can also encourage growth in alternative forms of financing outside the banking system.¹

These activities can often be attributed to the shadow banking system, which can be defined as a system of “credit intermediation involving entities and activities outside the regular banking system”.² Alongside shadow banking entities, this definition encompasses credit intermediation chains involving several entities from various areas of the financial system.³ In line with the rather conservative definition used in this article, the shadow banking system includes domestic investment funds (including hedge funds and exchange-traded funds, or ETFs), money market funds and other financial intermediaries.⁴

The financial crisis showed that risks to the stability of the financial system as a whole can emerge from outside the banking system. On the one hand, problems with shadow

The financial crisis showed that risks to the stability of the financial system as a whole can emerge from outside the banking system.

banking activities, such as the securitisation of loans, contributed to the financial crisis. On the other hand, entities attributable to the shadow banking system, such as money market funds, experienced distress. In Germany, for example, linkages to foreign financial vehicle corporations led to numerous credit institutions experiencing acute difficulties and to government rescue measures.⁵

Generally speaking, interconnectedness between the banking system and institutions outside its regulatory framework can result in the transfer of risk. This can occur directly – via credit and funding relationships or liability mechanisms and the granting of guarantees, say – or indirectly, through shared counterparties or investment in the same types of assets.

To be able to identify potential systemic risks at an early stage, alternative forms of credit intermediation must be monitored. The Bundesbank draws on a variety of statistics to analyse the shadow banking system and the interconnectedness of its intermediaries. This approach is necessary since there are no dedicated statistics for monitoring the shadow banking system. The data sources used include the financial accounts as well as primary statistics and datasets from prudential reporting. Specifically, these comprise the statistics on investment funds, statistics on financial vehicle corporations (FVCs) and balance sheet data on securities and derivatives dealers (SDDs), financial corporations engaged in lending (FCLs) and financial leasing and

To be able to identify potential systemic risks at an early stage, alternative forms of credit intermediation must be monitored.

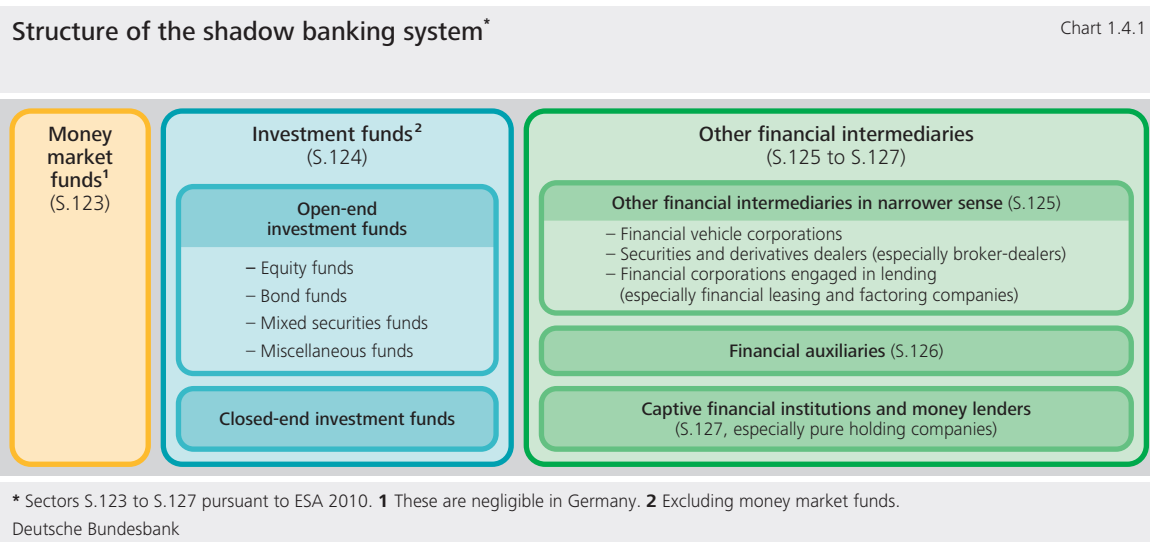
¹ See, for example, J Duca (2015) on the falling costs of information technology as a driver for the provision of short-term credit by the shadow banking system.

² For the definition agreed by the Financial Stability Board (FSB), see Financial Stability Board (2011).

³ For alternative definitions, see, for example, T Adrian, A Ashcraft, H Boesky and Z Pozsar (2010), P Mehrling, Z Pozsar, J Sweeney and D Neilson (2013), S Claessens and L Ratnovski (2014) and A Harutyunyan, A Massara, G Ugazio, G Amidzic and R Walton (2015).

⁴ Other financial intermediaries (OFIs) in the narrower sense comprise the S.125 sector pursuant to the ESA 2010 statistics standard, and in the broader sense (as used in the following, including when not specified), sectors S.125 to S.127.

⁵ For the costs of the financial crisis with budget implications since 2007 in Germany and other European countries, see Eurostat (2015). For the estimated economic costs of systemic crises worldwide, see, for example, L Laeven and F Valencia (2012).



factoring companies. The external position of monetary financial institutions (MFIs) and the reporting of loans of €1 million or more can also provide insights into the interconnectedness between domestic banks and the shadow banking system inside and outside Germany.

The approximation of the size of the shadow banking system is mainly based on the financial assets of shadow banking entities (see Chart 1.4.1). These are supplemented by non-financial assets held by open-end real estate funds, which form a subgroup of investment funds.⁶ Expanding this approach to include analyses based on shadow banking activities is contingent on improved data sources, for which there are plans, particularly in respect of securities financing transactions.⁷

The annual monitoring exercise of the Financial Stability Board (FSB) contributes to the analysis of developments in the global shadow banking system. In its Global Shadow Banking Monitoring Report 2015, the FSB presents a method for calculating a more risk-based measure for the shadow banking system. This method is still evolving.

Shadow banking sector's role in the financial system has grown

The German shadow banking sector more than tripled in size, in nominal terms, between the start of 1999 and the second quarter of 2015, to around €2.6 trillion (see Chart 1.4.2).⁸ In the same period, the shadow banking sector's share of assets in the financial sector as a whole rose from 9% to 18%. This relative gain in significance is attributable to an absolute increase in the financial assets of the shadow banking sector and to a decline in the financial assets of the banking sector

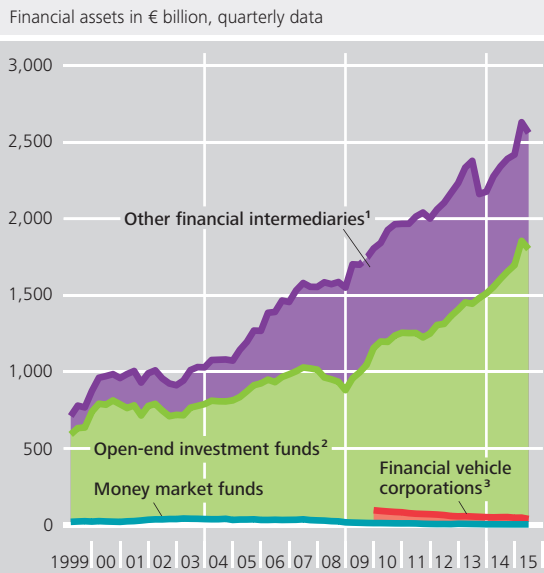
The German shadow banking sector more than tripled in size, in nominal terms, between the start of 1999 and the second quarter of 2015.

⁶ Data on the size and development of the shadow banking sector as an aggregate and of the other financial sectors are based on the financial accounts pursuant to ESA 2010. The data on the non-financial assets of open-end real estate funds are an exception; this information is drawn from the statistics on investment funds.

⁷ Data on securities financing transactions will probably be available from 2018 at the earliest, on the basis of a future Regulation of the European Parliament and of the Council.

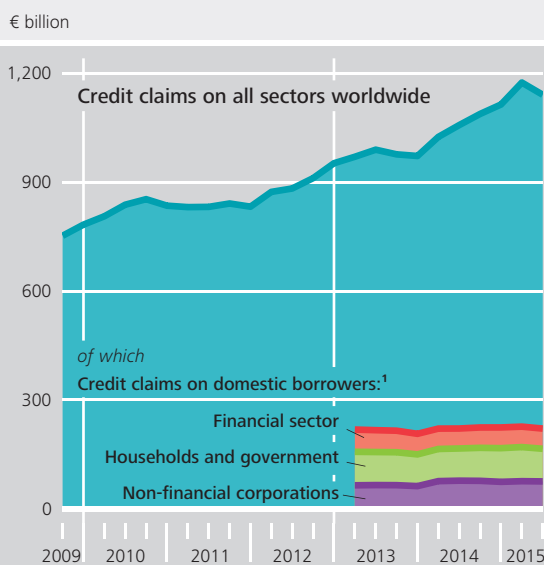
⁸ For a detailed description of the shadow banking system in the euro area, see Deutsche Bundesbank (2014), p 18.

Structure of the German shadow banking sector Chart 1.4.2



Sources: ECB, financial accounts, Bundesbank primary statistics and Bundesbank calculations. **1** From end-2009, excluding financial vehicle corporations. **2** Excluding money market funds. Including non-financial assets of open-end real estate funds. **3** Data available from end-2009 only.
 Deutsche Bundesbank

Credit claims of the German shadow banking sector* on domestic and foreign borrowers Chart 1.4.3



Sources: Financial accounts and Bundesbank calculations. * Credit granted by, and debt securities held by, the shadow banking sector. **1** Breakdown by borrower sector available from 2013 only. Excluding money market funds.
 Deutsche Bundesbank

associated with the process of deleveraging from 2008 onwards.

The growth of the shadow banking sector partly reflects the increases in value in the financial markets that have been recorded over the past few years. The growing importance of the shadow banking sector is therefore probably attributable not only to inflows of funds, but also to the performance of the assets held in the shadow banking system (see the section entitled “Valuation effects a key growth factor” on pages 62 and 63). Should the shadow banking sector hold a higher share of capital market-based products than the banking sector, its assets would respond more strongly to changes in asset prices than those of the banking sector, owing to valuation effects.

German shadow banking sector chiefly lends to foreign borrowers

In the event of stress in the German shadow banking sector, funding risk may materialise on the part of borrowers. A large portion of the refinancing provided by the German shadow banking sector is granted to foreign borrowers.⁹ The percentage of loans extended to foreign borrowers and of foreign-issue debt securities held amounted to roughly 80% of credit claims worldwide in mid-2015, according to data from the financial accounts (see Chart 1.4.3). The German shadow banking sector’s bond and credit exposures to all domestic sectors thus amount to a share of only about one-fifth. In this data source, which is based on the principle of residency, foreign subsidiaries of domestic enterprises cannot be distinguished from other foreign

⁹ Loans and debt securities made up just under half of all of the shadow banking sector’s financial assets in the second quarter of 2015. A more detailed discussion of the role of debt finance in the cross-border capital flows of the EU member states can be found in the chapter entitled “Capital markets union – financial stability and risk sharing” on pp 85-94.

entities. This is likely to overstate the foreign share compared with a consolidated view.

Investment fund sector is biggest player in German shadow banking system

The heavyweight in the German shadow banking sector is the investment fund sector (excluding money market funds). In the second quarter of 2015, it accounted for roughly two-thirds of the shadow banking sector's

The heavyweight in the German shadow banking sector is the investment fund industry.

financial assets. By contrast, money market funds are negligible in Germany, making up around

€4 billion or 0.15% of

the shadow banking sector's financial assets. The remaining third is accounted for by other financial intermediaries, which include a host of more minor entities with varying business models, such as financial vehicle corporations and financial leasing and factoring companies. (Pure) holding companies and broker-dealer companies, which in Germany almost exclusively refer to securities and derivatives dealers, also fall within the category of other financial intermediaries.¹⁰

Risks to financial stability can emanate from investment funds

Investment funds act as intermediaries in the financial system, investing the money provided to them on behalf of their investors.¹¹ Their capacity to contribute to the diversification of investment activity gives them an important intermediary function in the financial system. Against this backdrop, and in view of the growing importance of investment funds, a key role is played by their interconnections,

in particular, as well as the potential interaction with other market participants in periods of stress in the financial markets.¹²

Unlike closed-end funds, open-end funds permit their investors to redeem their fund units promptly. This means that shareholders can react quickly to changing market conditions. However, this may entail liquidity or maturity transformation if the funds invest in less liquid and longer-term assets. In the event of strong liquidity or maturity transformation, the fund sector gives rise to risks to financial stability – particularly in the case of unexpectedly large outflows. Incentives for redeeming fund units as early as possible (first-mover advantage) in the case of illiquid assets and small liquidity buffers can, in such a scenario, trigger self-reinforcing unit redemptions.

The liquidity buffers that funds have to hold against heavy outflows are often calculated by their parent undertakings using stress tests.¹³ Should these liquidity buffers be insufficient, the funds in question could be forced into fire sales of their assets. Moreover, investors might question the risk management of all funds distributed by one parent or funds with a similar investment focus and withdraw their money. As a result, price volatility and market illiquidity could be increased and transferred to previously unaffected market segments.¹⁴

Aside from this contagion via the financial markets, the interconnections between the investment fund

¹⁰ A significant part of the OFI sector cannot be broken down in more detail using the available statistics, however.

¹¹ On the question of whether asset managers and investment funds make a specific contribution to financial instability (in a hypothetical comparison with direct investment by the respective investors), see D J Elliott (2014), pp 5-7.

¹² See, for example, International Monetary Fund (2015) on the current debate about the role of the asset management industry for financial stability.

¹³ See N Dötz and M Weth (2013) on the determinants of funds' liquidity buffers.

¹⁴ See G Cespa and T Foucault (2014) on the self-reinforcing nature of illiquidity in the financial markets.

sector and the rest of the financial system play a major role. On the one hand, the investment structure (assets side) of investment funds can help to identify sources of potential losses. On the other hand, the investor structure (liabilities side) can shed light on the extent to which potential losses of investment funds would have to be borne by other financial intermediaries.¹⁵

Microprudential regulation mitigates risk

German investment funds and their asset management companies have been regulated by the German Investment Code since 2013. The investment funds subject to supervision under the German Investment Code can be structured as undertakings for collective investment in transferable securities (UCITS), for which there are broadly standardised product guidelines throughout Europe on account of the UCITS Directive,¹⁶ or as alternative investment funds (AIFs). The latter form encompasses both retail funds for private investors and specialised funds for institutional investors. Amongst other things, the German Investment Code contains provisions designed to curtail typical risks associated with credit intermediation outside the banking system (such as run risk, liquidity risk and risks stemming from the use of leverage) as well as incentive problems.

Since 12 May 2015, however, the Federal Financial Supervisory Authority (BaFin) has changed its administrative practice¹⁷ to now permit the direct origination of loans as well as loan restructuring and prolongation by AIFs in Germany. Previously, open-end and closed-end AIFs in Germany were only permitted to purchase unsecuritised loan claims. In its draft Act Implementing the UCITS V Directive,¹⁸ the Federal Government has proposed specific provisions that seek to curb the risks involved in direct lending.

Valuation effects a key growth factor

In Germany, open-end investment funds (excluding money market funds) constitute one of the strongest growing sectors in the financial system, with average annual growth in assets of 9.5% since September 2009.¹⁹

In August 2015, the aggregate total assets of the 6,013 open-end investment funds amounted to €1,753 billion (September 2009: €1,032 billion), according to the statistics on investment funds (see Chart 1.4.4). With a market share of around 75% (€1,328 billion), the specialised funds available exclusively to institutional investors are the most significant type of investment. Retail funds, which are also open to the general public, account for the remaining market share of 25%.

84% of the growth in the investment fund sector between September 2009 and August 2015 can be attributed to increases in the value of fund assets under management and just under 16% to net inflows. Greater use of debt finance, for example a higher debt ratio to leverage

84% of the growth in the investment fund sector between September 2009 and August 2015 can be attributed to increases in the value of fund assets under management and just under 16% to net inflows.

¹⁵ For information on the risk of losses posed to banks and insurers when investing in specialised funds, see Deutsche Bundesbank (2012), pp 68-69.

¹⁶ See Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014.

¹⁷ See Federal Financial Supervisory Authority (2015).

¹⁸ See Federal Ministry of Finance (2015).

¹⁹ Here and in the following, current figures from the statistics on investment funds are compared with figures from September 2009, the point at which a granular overview of the fund portfolios first became available. In future, closed-end funds will also be captured in the statistics on investment funds.

securities positions, played no part in the fund sector's growth.

Market concentration in the fund sector on the rise

In the context of sustained fierce competition in the fund sector, the process of consolidation resulting in fewer but larger asset management companies is continuing.²⁰ To take account of the respective

In the context of sustained fierce competition in the fund sector, the process of consolidation resulting in fewer but larger asset management companies is continuing.

strengths and weaknesses of concentration measures, the following analysis considers both market shares and simple measures of concentration: the Gini coefficient and the Herfindahl index.²¹ The

market share of the five largest asset management companies in Germany rose from 50.3% to 54.3% between September 2009 and August 2015. At the same time, the Herfindahl index went up from 6.4% to 7.8%. The Gini coefficient also increased by ten percentage points to 80%.²² In addition, the market share of the 50 largest funds grew by 2.5 percentage points to 26.2%. This concentration process can give rise to intermediaries whose increased presence in the financial markets can make them systemically important.²³

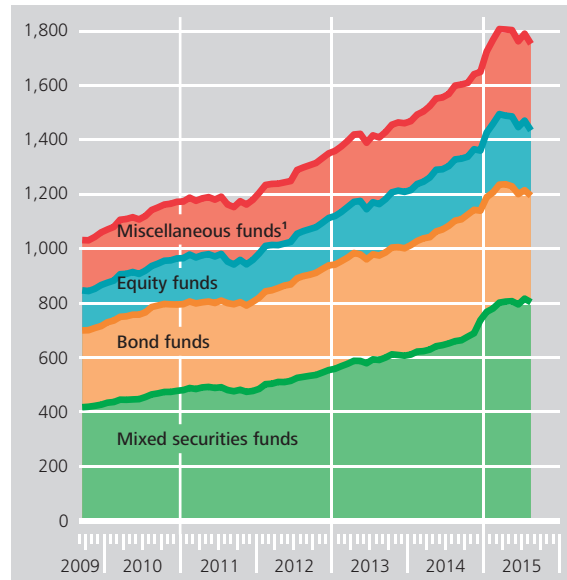
Investment funds are heavily interconnected with the rest of the financial system via both assets and liabilities

The investment structure of investment funds is geared towards the financial sector. At €839 billion, or 53%, the financial sector is the key counterparty for the fund sector's total securities investments of €1,582 billion. The remaining 47% is spread across

Structure of open-end investment funds in Germany*

Chart 1.4.4

Total assets in € billion



* Excluding money market funds. 1 Pension investment funds, funds of funds, derivatives funds, hedge funds and real estate funds as well as other funds.

Deutsche Bundesbank

government and corporate securities.²⁴ Within the financial sector, just under 20% is attributable to banking sector securities and around two-thirds of investments to the shadow banking system (€506 billion). Of the latter, roughly three-fifths is accounted for by the investment fund sector and two-fifths by other financial intermediaries.

²⁰ For information on the consolidation of the fund industry, see Deutsche Bundesbank (2013), p 16.

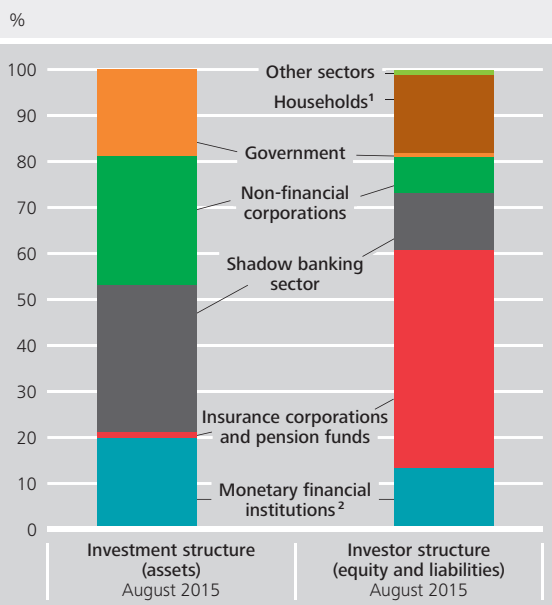
²¹ The Gini coefficient represents the ratio of the area of a line of equal distribution to the area of actual distribution in the fund sector. The Herfindahl index gives the sum of all squares of the market shares of the asset management companies.

²² For information on the increasing market concentration in the European fund sector, see European Central Bank (2014), p 46.

²³ See Financial Stability Board and International Organization of Securities Commissions (2015) on the systemic importance of financial market players outside the banking and insurance sectors.

²⁴ For the structure of the bond portfolios of German investment funds, see Deutsche Bundesbank (2013), p 26.

Balance sheet structure of open-end investment funds in Germany by sector Chart 1.4.5



¹ Including non-profit institutions serving households. ² Excluding money market funds.
 Deutsche Bundesbank

The financial sector not only dominates among the investments of German investment funds, but also among their investors. According to the statistics on securities investments, the financial sector's share rose by just under 8 percentage points to 73% between September 2009 and August 2015. This corresponds to €1,233 billion (see Chart 1.4.5).

Holdings of fund units grew particularly for insurers and pension funds, which traditionally make investments via funds. The market value of the German fund units they held increased by 124% to €801 billion between September 2009 and August 2015 (for information on insurers, see the chapter entitled "Risks in the life insurance sector" on pages 41 to 55). The relative weight of investment funds in the total investments of German insurers thus grew from 24.2% in September 2009 to 32.2% in June 2015.²⁵ By contrast, German credit institutions

reduced their holdings in the German fund sector to 13.3% over the same period, also reflecting the deleveraging process that had taken place.²⁶

Risk indicators for the investment fund sector largely stable

The business model of a fund can be described in terms of its investment focus, such as shares or fixed-income securities, or in terms of its risk features. Similarly to the works of international bodies, the following analysis considers indicators that depict material risks of shadow banking intermediaries.²⁷ For instance, an intermediary's business volume and its growth are used as broad indicators of the entity's systemic importance.²⁸ Furthermore, indicators of maturity transformation and use of debt finance demonstrate the extent to which shadow banking intermediaries obtain finance by borrowing short-term and lending long-term, or leverage investments by debt financing. Liquidity transformation reflects the ratio of liquid assets to total assets that can be used to cover sudden liquidity needs. Interconnectedness with the banking sector indicates possible direct contagion channels between various financial intermediaries. The extent to which shadow banking entities conduct bank-like business is approximated by means of credit intermediation (for the precise definitions, see Table 1.4.1).²⁹

²⁵ Data according to BaFin's statistics on the capital investments of primary insurers.

²⁶ See Deutsche Bundesbank (2013), p 19.

²⁷ See Financial Stability Board (2013) and International Monetary Fund (2014).

²⁸ See Financial Stability Board and International Organization of Securities Commissions (2015).

²⁹ On the suitability of liquidity indicators as macroprudential monitoring indicators, see, for example, M K Brunnermeier, G Gorton and A Krishnamurthy (2012).

Definition of risk indicators for shadow banking intermediaries Table 1.4.1

Risk indicator	Definition	Description	Value range	Proxy for numerator	Proxy for denominator
Size	Total assets	Business volume	Absolute amount	Total financial assets ¹	–
Maturity transformation	Current assets / total assets	Extent of maturity-matched funding of current assets using current liabilities	100% (matched maturities) to 0% (maximum maturity transformation)	Cash and deposits + short-term debt securities + short-term loans	Total financial assets ¹
Liquidity transformation	Liquid assets / total assets	Balance sheet share of liquid assets that can be sold to cover sudden liquidity needs	100% (no liquidity transformation) to 0% (maximum liquidity transformation)	Cash and deposits + debt securities + listed shares	Total financial assets ¹
Leverage	Total assets / equity	Extent to which investments are leveraged through debt financing	100% (no debt financing) to unlimited (maximum leverage)	Total liabilities ²	Investment fund shares/ units outstanding (liability)
Credit intermediation	Credit assets / total assets	Balance sheet share of bank-like business	0% (no bank-like business) to 100% (exclusively bank-like business)	Debt securities + loans + other assets and liabilities	Total financial assets ¹
Interconnectedness with the banking sector	Assets with credit institutions as counterparty / total assets	Extent of possible direct contagion in the event of problems in the banking sector	0% (no direct contagion risk) to 100% (maximum direct contagion risk)	Demand deposits + other deposits + debt securities issued by monetary financial institutions (MFIs) + loans to MFIs ³ + listed shares of MFIs + derivatives	Total financial assets ¹

¹ Including non-financial assets of open-end real estate funds. ² This may differ from total financial assets. ³ Item not available.

Deutsche Bundesbank

For the German fund sector, these risk indicators can be calculated on the basis of data from the financial accounts and from the statistics on investment funds (see Table 1.4.2). Aside from growth, the risk indicators have shown no noticeable change since the end of 2013.

Maturity and liquidity transformation in the sector remain largely stable, for instance. Nor is there any notable risk of excessive use of debt finance. This

may also be partly due to the regulation of the fund sector. Its interconnectedness with the banking sector is lower than 10%, which indicates only minor assets-side contagion risk in the event of stress in the banking sector.

Owing to the heterogeneity of the entities in the fund sector, however, it is also necessary to look at risk indicators at the fund level. To minimise complexity, a cluster analysis can be used, on the basis of the funds' risk indicators, to assign the funds to clusters that have similar business models (see the box entitled "Risk indicators for individual

Aside from growth, the risk indicators have shown no noticeable change since the end of 2013.

Risk indicators for individual segments of the investment fund sector

Individual investment funds are considered fairly unimportant for the financial system as a whole on account of their mostly small size. However, the turbulence that affected money market funds between 2007 and 2009 showed that risks may also be posed to financial stability where a plurality of funds have a similar business model, eg in respect of their investment policy or funding model.

With a view to assessing the risk situation in the German investment fund industry, funds are classified according to their risk profile. In order to derive a risk profile, risk indicators are calculated on the basis of the investment fund statis-

tics at fund level. These show the maturity and liquidity transformation along with the degree of leverage, credit intermediation and interconnectedness with the banking sector (see Table 1.4.1 on page 65). To identify the various fund clusters, the individual funds are assigned to a group which has similar risk indicators using cluster analysis.¹

¹ These clusters are defined using the k-means algorithm. This minimises the deviations of the risk indicators of the individual funds within the same cluster and at the same time maximises the difference vis-à-vis funds of other clusters. The optimum number of clusters needed to describe the fund industry is determined iteratively by minimising the sum of the squared differences.

Cluster analysis: risk indicators of open-end investment funds in Germany*

Risk indicator	Cluster 1		Cluster 2		Cluster 3		Cluster 4	
	Sep 2009	Aug 2015	Sep 2009	Aug 2015	Sep 2009	Aug 2015	Sep 2009	Aug 2015
Size (total assets) in € bn	377.8	437.6	32.8	333.9	414.4	797.2	211.0	184.6
Maturity transformation in %	6.6	5.0	53.7	7.6	5.3	3.5	8.1	7.5
Liquidity transformation in %	45.2	11.2	93.1	92.6	94.4	91.7	95.3	91.4
Leverage in %	114.8	113.0	102.7	101.8	100.5	101.2	101.0	102.8
Credit intermediation in %	6.5	7.6	24.0	8.4	80.2	81.7	85.6	80.3
Interconnectedness with the banking sector in %	13.7	8.3	70.3	15.4	23.6	18.5	57.8	54.1

* Excluding money market funds. The clusters group together funds with similar risk indicators. The cluster analysis used for this is based on the k-means algorithm. The total assets show the aggregate per cluster. All other risk indicators show the average risk indicator of all funds belonging to the cluster weighted by total assets. The maturity and liquidity transformation as well as the credit intermediation and interconnectedness with the banking sector were calculated with the total assets as the denominator.

Funds strongly interlinked with the banking sector on the decline

As a result of this cluster analysis, the German investment fund industry can be broken down into four clusters. These differ more strongly with regard to the risk indicators credit intermediation and interconnectedness with the banking sector than for the risk indicators maturity and liquidity transformation and leverage, which are regulated directly by the German Investment Code (see the table on page 66). The low share of credit intermediation in clusters 1 and 2 indicates that these mostly contain equity and mixed securities funds. By contrast, clusters 3 and 4 seem to include mainly bond funds, which are engaged in credit intermediation to a significantly higher degree.

From a financial stability perspective, two developments between September 2009 and August 2015 may be regarded as positive. First, all fund clusters reduced their interlinkage with the banking sector, thus lessening the direct potential contagion risk of losses from the banking sector spilling over to the fund industry. Second, those funds which both invest their fund assets chiefly in the banking sector and are intensively involved in credit intermediation became less significant (cluster 4). In contrast to all other fund segments, the aggregated balance sheet total of these funds decreased by 12.5%, which lowered their relative share of the German investment fund industry from 20.4% to 10.5%.

segments of the mutual fund sector” on pages 66 and 67).

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Risk indicators for open-end investment funds in Germany* Table 1.4.2

Risk indicator	30 June 1999	30 June 2005	30 June 2010	30 June 2015
Size (financial assets) in € bn	609.9	837.2	1,107.5	1,762.6
Maturity transformation in %	5.9	8.4	5.9	5.2
Liquidity transformation in %	97.8	95.7	75.1	72.0
Leverage in %	101.6	103.9	104.5	103.2
Credit intermediation in %	.	.	54.8	49.8
Interconnectedness with the banking sector in %	.	.	.	8.5

Sources: Financial accounts and Bundesbank calculations. * Excluding money market funds. Financial assets including non-financial assets of open-end real estate funds.
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Strengthening the resilience of the German financial system

■ Macroprudential policy

The global financial crisis demonstrated in no uncertain terms how systemic risk can impair financial stability and also spill over into the real economy. This painful lesson was the cue for the emergence of macroprudential policy – a new policy area that is dedicated to safeguarding the stability of the financial system as a whole and which augments traditional financial supervision, with its microprudential perspective.

The bulk of the macroprudential policy instruments have so far targeted the banking sector. For example, recovery and resolution regimes for banks are already at a relatively advanced stage of development. In particular, the requirement for institutions to maintain sufficient total loss-absorbing capacity (TLAC) will act to shield taxpayers from the recovery or resolution of global systemically important banks (G-SIBs). Less progress, meanwhile, has been made in alleviating the too-big-to-fail problem elsewhere in the financial system, such as the insurance sector.

Several macroprudential instruments for the banking sector have their origins in the Basel III package. The Capital Requirements Directive (CRD) and the Capital Requirements Regulation (CRR), which transpose Basel III and other legislation into European law, have given supervisory authorities an extensive toolkit which includes capital buffers for systemically important institutions as well as the countercyclical capital buffer (CCB). The latter instrument, which is scheduled to become operational in Germany in 2016, seeks to curtail the risk posed by excessive credit growth.

Germany has so far been insufficiently equipped to cope with the risks which the mortgage lending market might pose to financial stability. This deficit prompted the German Financial Stability Committee, in June 2015, to recommend that the Federal Government create legal foundations for a set of new macroprudential instruments regulating residential real estate loans.

Macroprudential policy: safeguarding the stability of the entire financial system

One of the key takeaways from the financial crisis is that systemic risk can wreak havoc on financial stability before spilling over into the real economy. This painful lesson was the cue for the emergence of a new policy area which augments traditional financial supervision. Unlike microprudential supervision, which safeguards institution-level stability, the new field of macroprudential supervision sets its sights on the robustness of the financial system as a whole. Macroprudential policy covers both rulemaking, ie macroprudential regulation, and the application of those rules, such as the activation of a macroprudential capital buffer.

The macroprudential policy toolkit¹ is still very much on the drawing board in many countries, but elsewhere, such as in a number of Asian emerging market economies, it has already been long used. Macroprudential regulation in the broader sense of the term also includes regimes which facilitate the orderly resolution of systemically important financial institutions in insolvency without undermining the stability of the financial system as a whole. Such resolution regimes for banks are already quite highly developed. International bodies are currently working on requirements for systemically important financial institutions to maintain sufficient total loss-absorbing capacity (TLAC). The ultimate objective is to minimise, or eliminate altogether, the need for taxpayers to contribute to the recovery or resolution of a failed institution.

Some instruments can already be deployed, their legal foundations having been established immediately in the wake of the financial crisis. The European Capital Requirements Regulation (CRR) and the Capital Requirements Directive IV (CRD IV) contain a number of these instruments. In Germany,

CRD IV has been incorporated into the Banking Act (*Kreditwesengesetz*).

Macroprudential policy is conducted not only on an international and European scale but to a large extent at the national level as well. This is a crucially important insight, especially when it comes to addressing systemic risk emanating from real estate markets, because national property markets and the real estate financing business itself are highly heterogeneous. In Germany, the macroprudential toolkit for addressing systemic risk in the real estate market is largely confined to instruments which address banks' capital. This shortcoming prompted the Financial Stability Committee, in June 2015, to recommend that the Federal Government create legal foundations that will bring housing loans directly into the firing line of macroprudential regulation.

Headway in curbing the too-big-to-fail problem

In the past, failing financial institutions often had to be rescued using taxpayers' money to avoid destabilising the financial system. Large institutions in particular were thought to be too systemically important to be resolved (too big to fail). Scaling back these implicit subsidies expected by market participants is a crucial step in bolstering the credibility of the regulatory reforms which the Group of Twenty (G20) set in motion in the wake of the financial crisis. In an effort to resolve the too-big-to-fail problem, the Financial

In the past, failing financial institutions often had to be rescued using taxpayers' money to avoid destabilising the financial system.

¹ A summary of macroprudential instruments can be found in European Systemic Risk Board (2014c). S Claessens, S R Ghosh and R Mihet (2013) use panel data for 48 countries to investigate the impact of macroprudential measures.

Stability Board (FSB) joined forces with international standard-setters to draw up a coordinated package of measures. These measures, some of which have already been implemented, seek to achieve two key goals. First, they are designed to improve financial institutions' loss-absorbing capacity. Their second aim is to enable financial institutions that nonetheless fail to be resolved at no cost to the taxpayer and without destabilising the financial system. All that it now takes for the package of measures to come into effect is for the outstanding rules to be quickly adopted and implemented.

More capital means more resilient institutions

The stricter standards for the quantity and quality of regulatory capital introduced by the Basel III regime have already significantly improved banks' loss-absorbing capacity. However, the binding rules as they currently stand only address banks' risk-weighted assets (RWAs). More comprehensive regulation is needed here to accommodate potential discrepancies between banks' computed risk weightings and

Stricter standards for the quantity and quality of regulatory capital have already significantly improved banks' loss-absorbing capacity.

the actual risk content of their operations, and to curb the risk to which banks in general are inherently exposed because they run much more highly leveraged business models than other enterprises. Regulators are therefore planning to augment the stricter capital adequacy requirements with a cap on institutions' leveraging. This is where the leverage ratio – a bank's tier 1 capital as a percentage of its total exposures – comes into play. This metric is geared to both the institution's total assets and its off-balance-sheet transactions,² and is set to become mandatory at the beginning of 2018.

To reduce the likelihood of government rescue measures and further bolster the resilience of global systemically important banks (G-SIBs), these institutions will be required, as from 1 January 2016, to start building up an additional capital buffer composed of common equity tier 1 (CET1) capital. The FSB issued guidelines on this G-SIB capital buffer in 2010, which have since been transposed into European and national law. The G-SIB buffer rate is set according to each institution's systemic importance and currently ranges between 1% and 3.5% of the total risk exposure amount determined pursuant to Article 92 (3) CRR.³ The FSB publishes the global systemically important banks in its annual G-SIB List, stating the additional capital buffer they each must maintain.⁴

Similarly, starting in 2016, financial institutions which are systemically important elsewhere, ie only at the domestic level or in the European Economic Area, can also be required to maintain a CET1 capital buffer of up to 2% of the total risk exposure amount. The methodology for identifying such institutions in Germany was formulated by the Bundesbank in cooperation with the Federal Financial Supervisory Authority (BaFin).

Resolution regimes for banks set in motion

Requiring institutions to maintain additional capital buffers boosts their loss-absorbing capacity and thus enhances the stability of the financial system as well. However, in a

In a market economy it must be possible for systemically important institutions to fail. Functioning resolution systems for financial institutions are crucial for an orderly market exit.

² See Deutsche Bundesbank (2013), p 62.
³ See section 10f (1) of the Banking Act.
⁴ See Financial Stability Board (2015b).

market economy it must also be possible for systemically important institutions to fail. Functioning resolution systems for financial institutions are crucial for an orderly market exit.

Major milestones have already been reached in the development of effective resolution regimes for banks. The FSB published the final TLAC minimum standard for G-SIBs on 9 November 2015.⁵ The Bundesbank sees the TLAC standard as a key component in efforts to alleviate the too-big-to-fail problem. Starting in 2019, G-SIBs will be required to maintain a minimum TLAC safety buffer of at least 16% of RWAs or 6% of the denominator of the leverage ratio. The higher of the two values will be binding. From 2022 onwards, these figures will climb to at least 18% of RWAs or 6.75% of the denominator of the leverage ratio. The calibration of the TLAC buffer rate and the macroeconomic impact of the new standard were reviewed in impact studies lead-managed by the FSB.

The additional capital buffer to be used in a resolution event is composed of own funds and eligible liabilities. These resources need to be suited to absorbing the losses and costs of a recovery or resolution. Their purpose is to (re)capitalise viable areas of the failed bank and to ensure the continuity of its critical functions without taxpayer support. The overall objective is to make the resolution of systemically important institutions a more credible prospect. In tandem with the existing prudential capital adequacy requirements, this additional safety buffer will improve the loss-absorbing capacity of G-SIBs in resolution.

At the European level, the Bank Recovery and Resolution Directive (BRRD) sets minimum requirements for own funds and eligible liabilities (MREL), which institutions are required to maintain should they need to be resolved. Unlike TLAC, the MREL metric is set as an institution-specific rate by the competent resolution authority. Starting on 1 January

2016, MREL compliance must be achieved by every institution falling within the scope of the BRRD subject to a transitional period of up to 48 months. From a financial stability perspective, however, it is worrying that banks are permitted to hold an unlimited quantity of each other's MREL, so long as the resolution authority gives its consent. Should a crisis occur, this interconnectedness could contribute to an increased risk of contagion. To address this shortcoming, generally binding requirements along the same lines as the TLAC standard need to be added to the European regulations to prevent banks from becoming interconnected through the MREL channel.

The measures mentioned above would go a long way towards alleviating the too-big-to-fail problem. But at the end of the day, these measures will only really deliver the desired outcome if the rules are transposed into national law in a timely and consistent fashion. As long as the rules have not been fully implemented, the failure of a systemically important financial institution will expose taxpayers to quite substantial risks indeed. Ultimately, it is impossible to rule out all possibility that taxpayer support will be needed. But effective resolution regimes can reduce both the likelihood and the scale of taxpayer support for failed financial institutions. The sluggish and sometimes incomplete transposition of the BRRD into national law in some European countries is a worrying sign of reform fatigue.

The sluggish and sometimes incomplete transposition of the BRRD into national law in some European countries is a worrying sign of reform fatigue.

Germany transposed the BRRD into national law on time, with the Recovery and Resolution Act (*Sanierungs- und Abwicklungsgesetz*) coming into

⁵ See Financial Stability Board (2015a).

force on 1 January 2015 as part of a legislative initiative which also introduced the bail-in instrument ahead of schedule. The creation of the new Single Resolution Mechanism (SRM) meant that changes were made to the institutional set-up for bank resolutions. These changes are being accommodated by way of the Resolution Mechanism Act (*Abwicklungsmechanismusgesetz*). At the same time, legislators added a special insolvency rule to the Banking Act⁶ which makes unsecured bearer, order and registered debt securities as well as borrowers' note loans of banks subordinate to other senior liabilities. This legal provision, which will enter into force on 1 January 2017, will make it easier for German banks to promptly meet minimum capital requirements, should they need to be resolved. Here too, the overall objective is to make the resolvability of institutions without taxpayer support a more credible prospect. However, this rule might render these bank debt instruments ineligible as collateral for Eurosystem credit operations owing to the provision contained in the ECB's monetary policy guidelines prohibiting subordination.⁷

Quantifying the success of the measures taken to alleviate the too-big-to-fail problem is a difficult undertaking. Changes in external ratings and in banks' funding costs can offer an indication of whether implicit government subsidies have dwindled. Analyses suggest that the progress made so far has been modest at best. While implicit subsidies have been scaled back in most countries since the onset of the crisis – a development which has already fed through to the ratings of European banks⁸ – for G-SIBs, tacit government backing has actually become more firmly rooted than before.⁹ Whether this tendency will persist as further progress is made in implementing the measures outlined in this article remains to be seen.

Less headway made in developing resolution regimes for other financial market agents

The too-big-to-fail problem is not confined to the banking sector.¹⁰ Central counterparties (CCPs) are also financial agents that provide systemically important services. CCPs are financial market infrastructures (FMIs) that transpose themselves between the original counterparties of a financial market transaction and, in so doing, mutualise and reduce counterparty credit risk and bring stability to the financial system.

The too-big-to-fail problem is not confined to the banking sector.

CCPs attained greater systemic importance in the wake of the G20 agreement in September 2009 that OTC derivatives contracts should be cleared through CCPs. An appropriate regulatory framework including dedicated recovery and resolution regimes is therefore needed to ensure CCP stability. The European Commission is currently drafting a legislative proposal which will accommodate the need for international consistency in regime design.

The legal design of CCP recovery and resolution mechanisms has to strike a balance between mobilising additional financial resources to support a distressed CCP and respecting clearing participants' capacities for absorbing losses. Risk and liability must remain two sides of the same coin at all times. Losses on financial market transactions must be

⁶ See section 46f (5) to (7) of the Banking Act.

⁷ See Article 64 of Guideline ECB/2014/60 of the European Central Bank of 19 December 2014 as well as No 3.3 of the Opinion of the European Central Bank dated 2 September 2015 on the German draft law (CON/2015/31).

⁸ Two major credit rating agencies downgraded European banks this year, citing reduced implicit government subsidies owing to the introduction of the BRRD.

⁹ See German Council of Economic Experts (2014), pp 171 ff; and International Monetary Fund (2014), Chapter 3.

¹⁰ Nor is the too-connected-to-fail problem.

absorbed within the private sector so that taxpayer support is not needed to rescue FMI.

The financial market transactions of direct and indirect clearing participants can inflict heavy losses on a CCP which go beyond its financial capacities as defined in its risk management strategy. And with CCPs running a different business model to banks, say, it also follows that there are differences in the choice and degree of loss-absorbing capacities. Seeing as a CCP manages the risk inherent in the financial market transactions of third parties (clearing participants), it is appropriate for this exposure to be covered primarily by clearing participants' margins, rather than predominantly by the CCP's own capital. Recovery and resolution instruments need to be suited to allocating losses in a manner which does not pose a threat to financial stability. For instance, they must be capable of mutualising liability across all of a CCP's clearing participants. The CCP's own funds could also be tapped to make up any shortfall.

Progress towards alleviating the too-big-to-fail problem has been relatively sluggish elsewhere in the financial system. The FSB publishes a list of global systemically important insurers (G-SIIs) once

Progress towards alleviating the too-big-to-fail problem has been relatively sluggish elsewhere in the financial system.

a year.¹¹ One question which still has not been resolved, however, is whether reinsurers should also be given G-SII status. The process of developing capital add-ons for G-SIIs is already largely complete,¹² but comprehensive capital standards for international insurance groups still need to be finalised. Further analysis is needed before a methodology can be developed for identifying other systemically important financial agents (eg asset managers).

Countercyclical capital buffer: making banks more resilient

Progress has also been made in adding capital-based instruments to the macroprudential toolkit. Excessive credit growth is a particularly worrying development from a financial stability angle.¹³ If lending activity is exceptionally strong relative to aggregate economic output, it might indicate that risk is not being given the attention it deserves. These developments can create credit bubbles which, if they burst, could rock financial stability.

Starting on 1 January 2016, another macroprudential instrument will be available to the banking sector: the countercyclical capital buffer (CCB). The idea behind the CCB is to build up additional own funds during spells of excessive credit growth which can then be used to absorb losses in a crisis situation. This will make the banking system more resilient to cyclical systemic risk caused by inappropriate lending.

Starting in 2016, another macroprudential instrument will be available to the banking sector: the countercyclical capital buffer.

The CCB can be reduced in times of stress, with the capital in question then being used to absorb losses, say, or to grant new loans. So a bank that sustains losses will not be forced to stop lending or to offload assets. Thus, the CCB can play a role in ensuring a sufficient flow of credit to the real economy, even in times of stress.

¹¹ See Financial Stability Board (2015c).

¹² The International Association of Insurance Supervisors (IAIS) published proposals for higher G-SII capital requirements in October 2015; see International Association of Insurance Supervisors (2015).

¹³ See inter alia Ò Jordà, M Schularick and A M Taylor (2013), and G Kaminsky, S Lizondo and C Reinhart (1998).

Guided discretion used for operating buffer rate

A suitable indicator is needed to ensure that the CCB targets excessive credit growth. A study based on European Union data found that the credit-to-GDP gap was the best single leading indicator for banking crises.¹⁴

However, since the measurement of the credit-to-GDP gap (see Chart 2.1.1) is also subject to uncertainty, it should not be the sole indicator used when applying the CCB. The Bundesbank published the methodological framework for the CCB, notably the selection of indicators, in November 2015.¹⁵ According to that paper, decisions on an appropriate buffer rate follow the principle of “guided discretion”. In other words, the first step is to calculate the buffer guide, using the credit-to-GDP gap as the basis.¹⁶ The buffer guide represents the rules-based component. The buffer guide turns positive when the credit-to-GDP gap is larger than 2 percentage points. The maximum buffer guide of 2.5% would be reached if that gap were to reach 10 percentage points. As a second step, further quantitative and qualitative indicators are added to produce a comprehensive economic analysis. The output is a buffer rate that can be higher or lower than the calculated guide figure (discretionary scope).

Since the CCB is a new macroprudential instrument, the decision-making process needs to be sufficiently flexible to learn from experience. The discretionary component chiefly makes allowances for the uncertainty over the informative value of certain developments. As a case in point, indicators which signalled systemic risk in the past will not necessarily be as reliable going forward.

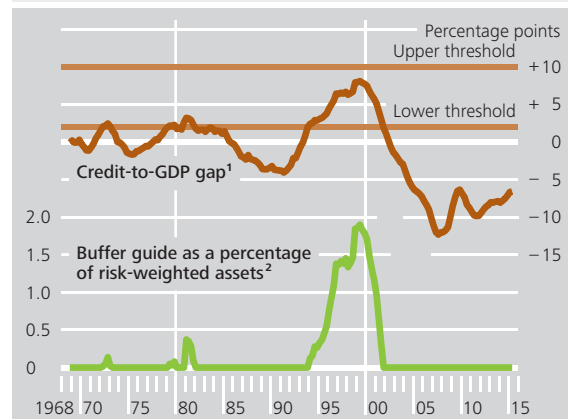
BaFin is Germany’s designated authority

BaFin is the designated authority operating the CCB rate in Germany. As from 1 January 2016, BaFin will

Countercyclical capital buffer for Germany

Chart 2.1.1

Quarterly data



Sources: Deutsche Bundesbank, Federal Statistical Office and Bundesbank calculations. **1** The credit-to-GDP gap shows the deviation of the credit-to-GDP ratio from its long-term trend. A large positive gap can point to excessive credit growth and indicates that the buffer should be activated. **2** The buffer guide increases linearly with the credit-to-GDP gap in the interval between zero and 2.5. The buffer rate will typically lie within this interval. The buffer guide will only ever be greater than zero if the credit-to-GDP gap exceeds 2 percentage points (lower threshold). The buffer guide reaches its maximum of 2.5 when the credit-to-GDP gap reaches or exceeds 10 percentage points (upper threshold).

Deutsche Bundesbank

set the CCB rate as well as the date from which it must be applied on a quarterly basis and decide, where necessary, on the recognition of CCB rates set by other countries. To make the decisions that go into operating the CCB rate transparent, designated authorities will announce and justify the buffer rate they set.

BaFin will set the CCB rate and decide, where necessary, on the recognition of CCB rates set by other countries.

The key pieces of legislation for operating the CCB are the Banking Act and the Solvency Regulation (*Solvabilitätsverordnung*), which are the legislative

¹⁴ See European Systemic Risk Board (2014a). The credit-to-GDP gap is defined as the deviation of the ratio of credit to gross domestic product (GDP) from its long-term trend.

¹⁵ See Deutsche Bundesbank (2015b).

¹⁶ See European Systemic Risk Board (2014b), p 10.

vehicles used to transpose the CCB requirements set out in CRDIV (which in turn are founded on the Basel III regime) into national law. The ERSB has also published various guidance documents on policies, indicators and other matters.¹⁷

Since the CCB is designed to respond to excessive aggregate credit growth, it augments the capital adequacy requirements set out in section 10d (1) of the Banking Act and is applied to the total risk exposure amount determined in accordance with Article 92 (3) CRR. That makes the CCB a macroprudential instrument with a relatively broad range. Excessive credit growth in certain areas such as residential real estate loans does not, when viewed in isolation, automatically trigger the CCB. But mortgage lending, say, is nonetheless relevant for the CCB in as far as it is a component of aggregate lending.

The CCB rate is set individually at the institution level and represents the weighted average of the CCB rates that apply in those countries where the relevant credit exposures of the institution are located.¹⁸ Banks are normally given 12 months to meet the buffer requirements.

International coordination needed

National buffer rates will be set in each EU member state by 2016 at the latest. A failure to coordinate activities might prompt an international bank to respond to the activation of the CCB in one country by shifting parts of its business to a country without a buffer requirement in an effort to evade stricter capital adequacy requirements.

National buffer rates will be set in each EU member state by 2016 at the latest.

The principle of reciprocity, that is the mutual recognition of national buffer rates, is instrumental in preventing such cross-border regulatory arbitrage. CRDIV states that reciprocity is mandatory for buffer rates of up to 2.5%. However, if other countries set CCB rates of more than 2.5%, those rates are only mandatory for domestic institutions if they have been recognised by the country's designated authority. The voluntary recognition of foreign buffer rates of more than 2.5% is highly recommended for EU member states.¹⁹

Reciprocity boosts CCB effectiveness and creates a level playing field across the European Union, internalising possible negative externalities and competitive distortions caused by cross-border lending. BaFin announces the domestic CCB rate, the date from which it must be applied as well as the recognised foreign buffer rates together with a justification for its decision on its website.

Reciprocity boosts CCB effectiveness and creates a level playing field across the European Union.

The onus is on national designated authorities and the ECB, which took charge of directly supervising the euro area's most significant institutions in November 2014, to coordinate their activities as far as possible. Hence the notification procedure stipulated in Article 5 of the Regulation on the Single Supervisory Mechanism (SSM Regulation),²⁰ under which national authorities are required to notify the ECB of their intention to take a macroprudential measure, giving prior notice of ten working days. Where the ECB objects, it shall state its reasons in writing within five working days. The national authority concerned will then duly consider the

¹⁷ See European Systemic Risk Board (2014b).

¹⁸ See section 10d (2) of the Banking Act.

¹⁹ See European Systemic Risk Board (2014b), p 5.

²⁰ See Council Regulation (EU) No 1024/2013 of 15 October 2013.

ECB's reasons prior to proceeding with the decision as appropriate. The CCB rate must also be reported to the ESRB.

Article 5 of the SSM Regulation gives the ECB the power to top up national macroprudential measures, but it cannot water them down. Where the ECB intends to act, the same notification deadlines as for the quarterly setting of the CCB rate by the national designated authorities shall apply.

Transparency and evaluation crucial

The disclosure of the buffer rates set in each country together with a justification for each one renders CCB decisions transparent, boosting the predictability of macroprudential policymaking. Market participants will find it easier to calibrate their expectations and schedule activities such as capital planning accordingly.

As with the use of other macroprudential instruments, an evaluation of instrument effectiveness is needed. That includes an *ex ante* assessment of the instrument's expected impact and an *ex post* evaluation of target achievement. *Ex post* evaluations also help to improve the accuracy of *ex ante* assessments when the instrument is redeployed at a later date, and make the instrument easier to calibrate.

New instruments in the pipeline for housing loans

Financial crises in the past were often sparked by excesses in real estate markets.²¹ The importance of the residential property market for the real economy and in households' asset formation means that systemic crises caused by mortgage lending dysfunction can be a catalyst for painful welfare losses.

Mounting real estate prices in tandem with excessive credit growth and slackening lending standards are particularly perilous for financial stability. Moving forward, macroprudential authorities will need a suitable toolkit if they are to nip such developments in the bud and reduce both the likelihood of financial crises and their fallout for the economy at large. In Germany, that toolkit has so far largely been confined to capital-based instruments which can be used to tighten the capital requirements for bank loans secured by immovable property. Instruments which directly target the lender-borrower credit relationship will be a useful addition to the toolkit, since they will enable supervisors to effectively counter or constrain systemic risk originating from housing loans.

Mounting real estate prices in tandem with excessive credit growth and slackening lending standards are particularly perilous for financial stability.

Property prices may have risen sharply in the past few years, but there are no signs of critical macroeconomic developments in Germany's housing market at the current juncture.²² That is not to say that housing loans cannot gradually emerge as a source of systemic risk. A set of macroprudential instruments which specifically targets housing loans therefore needs to be ready and operational in order to tackle unwelcome developments in the residential real estate market early on.

In a recommendation dated 30 June 2015, the Financial Stability Committee advised the Federal Government to create the legal foundations for new macroprudential instruments addressing residential real estate loans.²³ International organisations (IMF,

²¹ See M K Brunnermeier and I Schnabel (2014).

²² Housing price developments are discussed in Deutsche Bundesbank (2015a), pp 55-57.

²³ See Financial Stability Committee (2015).

Micro data and macroprudential policy

The Bundesbank analyses factors that are important to financial stability and identifies potential risks.¹ It also provides the analytical basis for the work of the Financial Stability Committee, Germany's macroprudential forum. The Bundesbank's analyses are therefore a prerequisite for macroprudential policy in Germany.

An analysis of purely aggregate data can conceal important details. This is because such analyses measure only changes relating to an "average" bank, an "average" enterprise or an "average" borrower. A concentration of possibly systematically important risks in parts of the system or interlinkages between institutions go unrecognised. Information regarding the change in the distribution of the underlying micro data is required for a meaningful risk assessment. The lessons learned from the US experience tell us, for instance, that a loosening of credit standards for subprime households can be a key cause of financial crises.² A development of that kind can only be identified from granular data.

Micro data are not only useful for macroprudential risk assessment and risk monitoring purposes, they are also important for calibrating policy interventions. Micro data can be used to more reliably determine which target groups are likely to be affected by macroprudential policy measures and to what extent. Furthermore, granular data are indispensable when analysing the costs and benefits of macroprudential interventions. When planning measures, for instance, they can be used to more accurately gauge the necessary degree of intervention and the resulting costs as well as to increase the effectiveness of macroprudential policy.

Macroprudential policy is a relatively new policy area, and knowledge about the transmission channels is still very limited. This makes it all the more important to examine the effectiveness of policy measures once they have been implemented and to identify any credible causal relationships. This, too, requires granular data, as they are necessary to determine whether the previously identified objectives were actually achieved as planned and, above all, whether they reached the intended target groups. Granular data also allow unintended side-effects to be identified and undesirable evasive action to be detected.

By establishing its Research Data and Service Centre (RDSC),³ the Bundesbank has taken an important step towards meeting the need for granular data. In future, the RDSC will maintain and link micro datasets and then make them available to both internal and external researchers in strict compliance with the relevant data protection and confidentiality provisions. A similar development is also unfolding at the European level. Back in 2007, the Governing Council of the ECB resolved on a paradigm shift towards granular collection procedures and micro databases in the euro area. This approach is now being resolutely pursued in the form of the

¹ See section 1 of the Financial Stability Act (Finanzstabilitätsgesetz).

² A Mian and A Sufi (2010), The great recession: lessons from microeconomic data, *American Economic Review* Vol 100 Issue 2, pp 51-56, as well as A Sufi (2014), Detecting 'bad' leverage, in M Brunnermeier and A Krishnamurthy (eds), *Risk topography: systemic risk and macro modelling*, University of Chicago Press, Chicago and London.

³ For further information on the RDSC, see <http://www.bundesbank.de/Navigation/EN/Bundesbank/Research/RDSC/rdsc.html>

Analytical Credit Datasets (AnaCredit) project, which will be operated at the level of the European System of Central Banks (ESCB).

As things currently stand,⁴ AnaCredit will initially collect loan-by-loan data on loans and deposits, with information on credit lines, selected off-balance-sheet instruments as well as derivatives to be included incrementally at a later date. The Bundesbank already collects data on single borrower units as part of its procedure for reporting large exposures (*Millionen kreditmeldewesen*). However, the reporting threshold of €1 million *de facto* excludes an analysis of the household sector as well as various other uses outside of banking supervision. This constitutes a major gap in macroprudential oversight.

The reporting threshold in AnaCredit is expected to be fixed at €25,000 for commercial borrowers and other legal persons. This means that SME loans can also be recorded, and the possibilities for analysis are widened significantly. The greater number of loans and exposures that are to be recorded and the predominantly monthly reporting frequency will result in a broader range of potential uses. This regular collection of data allows macroprudential supervisory authorities to analyse developments in the financial system in a timely manner. This is particularly important for the early identification of structural changes.

Collecting granular data entails IT investment costs for the reporting parties. Once the system has been implemented, AnaCredit can, however, provide savings over the medium term. The individual solutions that would otherwise be required in this area are no longer necessary, nor are the bulk of the cost-intensive special surveys. Existing reporting requirements could also be successively frozen, and then scaled back or even

done away with completely once AnaCredit is up and running.

Micro data are indispensable for well-founded policy decisions. The data collected by AnaCredit will, however, presumably not include all the information required to plug important gaps in macroprudential oversight. Additional granular data are necessary, in particular to allow a better assessment of systemic risks stemming from residential property loans.⁵ The information needed for these analyses is currently obtained using household samples and special surveys. However, these data are available neither in a timely manner nor on a regular basis, and collecting them usually entails relatively high costs. To close existing data gaps as efficiently as possible, micro data should be collected as part of regular reporting. When developing this reporting system, analytical requirements and cost-benefit considerations should be heeded, while taking due account of the relevant data protection and confidentiality rules.

⁴ As this report went to press (20 November 2015), the ESCB had still not formed a final opinion on this matter.

⁵ Deutsche Bundesbank, Financial Stability Review, November 2014.

FSB, ESRB and the European Commission) have also recommended that Germany review and, where appropriate, augment its macroprudential toolkit.²⁴

The four new instruments to be established would be as follows.

- A cap on a borrower’s total debt in a residential real estate loan as a share of the market value of the property used as collateral (loan-to-value ratio, LTV).
- The setting of a final deadline for the amortisation of a certain fraction of a loan or the setting of a maximum maturity (amortisation requirement).
- A cap on a borrower’s capacity to service debt as a share of their income (debt-service-to-income ratio, DSTI).
- A cap on the borrower’s total debt relative to their income (debt-to-income ratio, DTI).

These instruments are already operational in many countries.²⁵

A comprehensive toolkit is needed to tackle a broad spectrum of risk drivers – such as an inappropriately high debt burden combined with an ambitious interest and principal repayment schedule – and to combat possible evasive action.

The LTV ratio, for instance, requires borrowers to contribute a sufficient share of equity capital towards financing the property. The DSTI and DTI metrics, meanwhile, prevent households from running up too much debt overall relative to their income, a situation which might occur if they overestimate their future income patterns, say. Last but not least, the amortisation requirement constrains borrowers’ ability to extend the tenor of their mortgage loan and can be activated if they attempt to

circumvent income-based instruments or take other evasive action.

Granular loan-level data such as the percentage of debt capital are needed to facilitate risk analysis and, where appropriate, for instrument calibration purposes. Such data are not collected in Germany at the present time, raising the question of whether and to what extent national or European initiatives are conducive to closing such data gaps (see the box entitled “Micro data and macroprudential policy” on pages 80 and 81).

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Capital markets union – financial stability and risk sharing

The European Commission launched the capital markets union project with a view to strengthening the development and integration of European capital markets beyond the banking sector. At present, the bulk of cross-border investment in Europe takes the form of debt capital, with a significant share of capital flows being channelled via banks.

From a microeconomic perspective, bank loans perform an important function where information asymmetries and incentive problems exist between enterprises and investors. However, financial stability risks can arise if debt levels are too high and debt capital constitutes an excessively large share of international capital flows. As debt capital is usually provided to the borrower for a defined period and must be repaid, it cannot be used by enterprises to cushion the impact of losses. Moreover, enterprises can become insolvent if creditors do not roll over maturing loans. Equity capital, by contrast, is provided for an unlimited period with no repayment obligation and can be used to absorb corporate losses. A greater amount of equity capital therefore has the potential to strengthen the resilience of financial and non-financial corporations and boost financial stability.

The structure of European capital markets is also reflected in weak cross-border risk sharing in the euro area. The development and integration of various capital market segments (such as securitisation or equity capital) could play a part in improving the distribution of private-sector risks in the currency union.

In conjunction with other projects such as the European banking union, the capital markets union has the potential to help remove obstacles that are currently distorting enterprises' financing structures and the composition of capital flows in the EU. The objective should be a framework in which the market can operate efficiently.

Capital market integration in the euro area focused on debt capital

In 2014, the European Commission launched the capital markets union project with the aim of strengthening the development and integration of European capital markets. The initiative – in conjunction with previous changes to the EU’s institutional framework, which include the banking union and the reformed Stability and Growth Pact – is essentially a welcome one. While the capital markets union cannot address all of the causes and symptoms of the banking and sovereign debt crisis in the euro area, it can improve the conditions necessary for the efficient cross-border allocation of private-sector risks via capital markets.¹ In this way, the capital markets union can make an important contribution to reducing the euro area’s vulnerability to crises and generate a double dividend of stronger growth and greater financial system resilience.

Capital market integration in the euro area intensified in the years before the financial crisis, above all via debt capital markets. Debt capital accounted for around 65% of foreign investment in the euro area before the onset of the financial crisis. In the countries that were later hardest hit by the crisis, it accounted for 76% when the crisis hit its peak in 2008. Investment abroad by individual euro-area countries also took place primarily in the form of debt capital (see Chart 2.2.1).

The prevalence of debt capital is a reflection of Europe’s predominantly bank-based financial system. The assets of the

The prevalence of debt capital is a reflection of Europe’s predominantly bank-based financial system.

EU’s banking sector amounted to 334% of gross domestic product (GDP) in 2013. The banking sector in the EU is thus of consider-

ably greater significance than in Japan (196%) or the United States (88%). What is more, the ratio of bank assets to the total market capitalisation of equity and bond markets in EU member states is far higher than in many other countries.²

Different functions of equity capital and debt capital

An enterprise’s financing structure depends on many different factors.³ The legal characteristics of the various forms of financing play an important role here. These are what make it possible for corporate risks to be priced and split between different investors. Major differences exist, for example, between equity capital and debt capital.

Equity capital is provided by investors for an unlimited period. Dividends are dependent on an enterprise’s economic situation and can be suspended if this situation deteriorates. Losses are absorbed by equity capital. In return, equity investors are entitled to a share of corporate profits. They therefore bear the greatest risk amongst all investors.

Equity capital is provided by investors for an unlimited period. Losses are absorbed by equity capital.

Debt capital is usually provided for a limited period, resulting in refinancing risks for enterprises. Except where loan terms are renegotiated, interest and principal payments to lenders are defined

¹ At the heart of this chapter is the relationship between the capital markets union, effective cross-border risk sharing via capital markets, especially in the euro area, and financial stability. For details on the capital markets union in general, see Deutsche Bundesbank (2015).

² See S Langfield and M Pagano (2015).

³ For details on the determinants of enterprises’ financing structures, see Deutsche Bundesbank (2012), pp 13-27.

in advance in terms of timing and amount and are generally independent of an enterprise's business

Debt capital is usually provided for a limited period. Lenders typically only participate in loss sharing in the case of insolvency.

situation. Lenders typically only participate in loss sharing if the enterprise becomes illiquid or overindebted (ie in the case of insolvency). However, they are not generally

entitled to participate in corporate profits. In practice, financing instruments take on a large number of different forms, including hybrid forms combining features of equity and debt capital.

Bank loans, as one form of debt financing, are of major significance from a microeconomic perspective if there is a large degree of information asymmetry between investors and enterprises. This is the case if investors cannot sufficiently monitor an

Bank loans are of major significance from a microeconomic perspective.

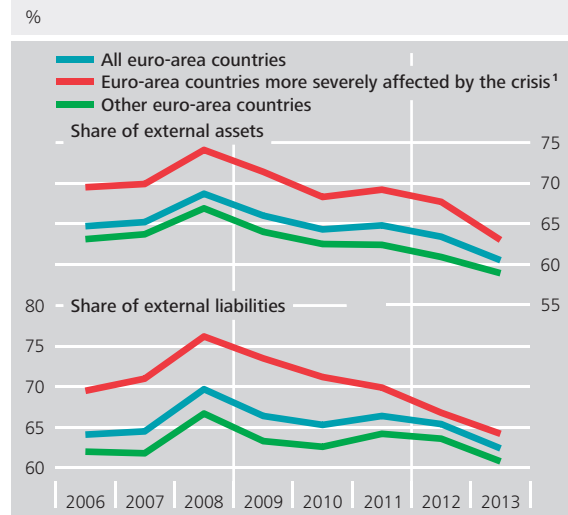
enterprise's risk-taking behaviour or if enterprises are significantly better informed about themselves and the profitability of their

investments.⁴ Banks can contribute to the dismantling of information asymmetries by means of credit scoring and monitoring. Beyond this, the fixed repayments and the fact these are generally independent of an enterprise's business situation mitigate the risks that investors might face as a result of information asymmetries.

Information asymmetries between investors and enterprises are particularly pronounced in the case of cross-border investment (especially in small and young enterprises). Nevertheless, the legal characteristics of debt capital – coupled with credit scoring and monitoring by (local) banks – can enable enterprises to access foreign capital.

Debt capital's share of external assets and liabilities*

Chart 2.2.1



Sources: IMF International Investment Position Database and Bundesbank calculations. * Assets and liabilities each cover direct investment, portfolio investment and other investment (including loans) pursuant to the Balance of Payments and International Investment Position Manual (BPM6); debt capital encompasses direct investment loans, debt securities and other investment (less TARGET2 claims and liabilities) excluding other equity. ¹ Cyprus, Greece, Ireland, Italy, Portugal and Spain.

Deutsche Bundesbank

On capital markets, investors set higher (public) transparency requirements for enterprises seeking debt and equity financing. Here it is in the enterprises' own interest to satisfy the information needs of potential investors in order to gain access to the markets and secure improved financing terms. Furthermore, the enterprises are subject to statutory prospectus and disclosure requirements. There are also specialised market participants, such as analysts and rating agencies, which analyse information about enterprises and pass on risk assessments to investors. An enterprise's transparency is important to equity investors, in particular, so that they can sufficiently assess risks.

⁴ The significance of banks and loan contracts in dissolving information asymmetries between lenders and borrowers has been analysed, inter alia, in the works of D W Diamond (1984), D Gale and M Hellwig (1985) and G Gorton and J Kahn (2000).

Focus on debt capital harbours risks for financial stability

A strong focus on debt capital in corporate financing can help alleviate information asymmetries at the micro level. However, at the same time it can also impair financial stability and negatively impact economic growth.⁵

A strong focus on debt capital in corporate financing can impair financial stability and negatively impact economic growth.

In the past, excessive debt increased the likelihood of financial crises, intensified their effects on the real economy and delayed the economic recovery once recessions were over.⁶ Equity, on the other hand, acts as a loss buffer for financial and non-financial corporations. All other things being equal, more equity can therefore increase the resilience of enterprises and thus the financial system as a whole, with correspondingly positive effects on the real economy.

A high proportion of debt capital in cross-border capital flows can adversely affect financial stability, too, as there is a particularly high risk of follow-up financing not being provided for maturing loans and bonds. The lack of follow-up financing by foreign investors (sudden stops) is a phenomenon that has often been observed in the financial crises of emerging market economies, where it has had a considerable impact on financial stability.⁷

The volatility of debt capital flows from abroad can also cause fluctuations in macroeconomic variables such as credit growth, output, inflation, asset prices and real exchange rates. By contrast, equity capital flows from abroad are, based on past experience, more stable and do not cause comparable macroeconomic volatilities. International direct investment in the form of equity capital, in particular, is less volatile, tends to strengthen economic

growth, reduces the risk of financial crises and alleviates their effects.⁸

Sudden reversal of private debt capital flows in the euro area following the onset of the crisis

A sudden reversal of private debt capital flows was also observed in the euro-area banking and sovereign debt crisis.⁹ In the years before the onset of the financial crisis, cross-border debt capital flows to the euro-area countries that were later hardest hit by the crisis increased sharply. However, debt-financed investment in these countries fell rapidly in the wake of the crisis (see Chart 2.2.2).¹⁰ There were net outflows of foreign debt capital between 2010 and 2013, despite capital inflows via loans from the EU's assistance programmes and the IMF.

By contrast, equity investment in the euro-area countries hardest hit by the crisis remained comparatively stable. The only fall observed was in 2008, and this was followed by a rapid recovery (see Chart 2.2.2).

⁵ See S G Cecchetti, M S Mohanty and F Zampolli (2011).

⁶ The relationship between debt and financial crises and the effects of these are shown, inter alia, by M Schularick and A M Taylor (2012) and Ò Jordà, M Schularick and A M Taylor (2013, 2015). For information on the development of debt in enterprises in the euro area, see Deutsche Bundesbank (2014), pp 53-66.

⁷ See G A Calvo, A Izquierdo and L-F Mejía (2004).

⁸ For information on the effects of the composition of international capital flows, see, inter alia, R Albuquerque (2003), C Calderón and M Kubota (2012), P R Lane and P McQuade (2014) and J S Davis (2014).

⁹ See S Merler and J Pisani-Ferry (2012).

¹⁰ A considerable share of banks' cross-border liabilities in these countries was substituted by increased refinancing by their national central banks. The resulting international payment flows manifested themselves in the accumulation of TARGET2 balances. These were eliminated from the assets and liabilities in Chart 2.2.1 and Chart 2.2.2 in order to show the actual development of private capital flows.

Weak cross-border sharing of private-sector risks in the euro area

The structure of international capital flows also has an impact on the extent of cross-border risk sharing via capital and credit markets. Risk sharing via integrated markets can generate welfare gains. In integrated markets, local risks are shared amongst investors from different regions. Individual investors can safeguard themselves against local income risks by diversifying their equity and debt-financed investment across borders.¹¹

As equity capital is provided for an unlimited period and equity investors participate in corporate profits and losses, international equity capital flows enable direct cross-border risk sharing. Integrated markets

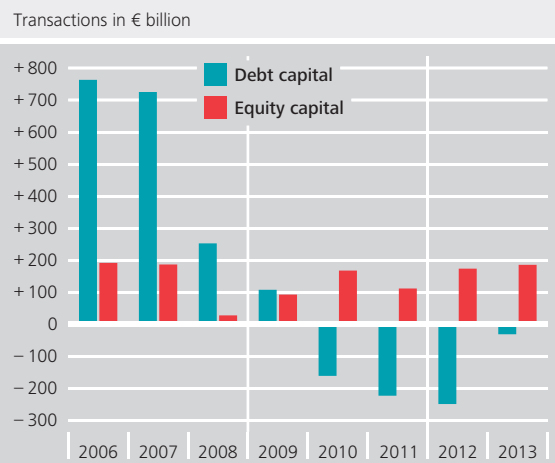
As equity capital is provided for an unlimited period and equity investors participate in corporate profits and losses, international equity capital flows enable direct cross-border risk sharing.

for debt capital (eg credit markets) or the securitisation of credit claims can also facilitate cross-border risk sharing.¹² However, debt investors only participate in the losses of an enterprise in the event of insolvency, which means

that cross-border risk sharing via debt capital is not direct. Cross-border risk sharing is constrained if the integration of capital markets is concentrated on financial instruments whose payout streams are not contingent on an enterprise's business situation.¹³

The cross-border sharing of private-sector risks is of particular importance in a currency union. The effectiveness of a single monetary policy diminishes if local shocks and divergent macroeconomic developments require different monetary policy responses for individual countries. As there are no exchange rate adjustments in a currency union, cross-border

Net investment by non-residents in the euro-area countries more severely affected by the crisis*
 Chart 2.2.2



Source: IMF Balance of Payment Statistics and Bundesbank calculations. * Cyprus, Greece, Ireland, Italy, Portugal and Spain. Net investment covers direct investment, portfolio investment and other investment (including loans) pursuant to the Balance of Payments and International Investment Position Manual (BPM6); debt capital encompasses direct investment loans, debt securities and other investment (less TARGET2 liabilities) excluding other equity. Negative net investment occurs when repayments from a given country exceed new investment in that country.

Deutsche Bundesbank

risk sharing plays an important role in balancing asynchronous business cycles and thus in supporting the stability of the currency union.¹⁴ The EU is not a federal state and the introduction of a fiscal system for cross-border risk sharing is not envisaged under the EU's current framework. It is therefore all the more important that capital markets and credit markets function as channels for risk sharing within the euro area.

Cross-border sharing of private-sector risks is of particular importance in a currency union.

11 See S Kalemli-Ozcan and B E Sorensen (2012).
 12 See M Hoffmann and I Shcherbakova-Stewen (2011) and M Hoffmann and T Nitschka (2012).
 13 See M Baxter and M J Crucini (1994) and L L Tesar (1995).
 14 See P de Grauwe (2014), pp 173 ff and 232 ff.

The degree of risk sharing can be empirically examined by decomposing the fluctuations in individual countries' GDP into the changes of individual GDP components. In the case of full international risk sharing, GDP fluctuations are balanced out via international capital markets and credit markets or by fiscal transfers. As a result, they do not lead to ups and downs in local consumption.

Estimates show that risk sharing via capital markets is weak in the euro area compared with other currency areas such as the United States or Canada. Between 2000 and 2007, only 6% of fluctuations in the GDP of euro-area countries were evened out

Estimates show that risk sharing via capital markets is weak in the euro area.

via capital markets. A total of 46% of the differences were not smoothed and impacted local consumption.¹⁵ In the United

States, by contrast, according to an analysis for the years 1964 to 1990, 39% of uneven economic developments were smoothed by interregional capital markets and only 25% of fluctuations impacted local consumption.¹⁶ Following the onset of the crisis in the euro area, cross-border risk sharing in the member states hardest hit by the crisis came to a virtual standstill.¹⁷

The weak risk sharing via capital markets and credit markets during the crisis in the euro area can be attributed first to the fact that systemic and policy-related risks are difficult to diversify. Second, it is a reflection of the structure of the financial system in the euro area. Cross-border investment predominantly takes the form of debt capital. Equity capital markets are comparatively poorly developed and, with the exception of the stock market, less well integrated.

Before the onset of the crisis, a significant proportion of cross-border capital flows within the euro area were the result of interbank lending. Banks in

the euro-area countries that were later hardest hit by the crisis were increasingly refinancing via the European interbank market.¹⁸ However, after the onset of the financial crisis, many institutions from the creditor countries retreated to their domestic markets. Banks in the countries hardest hit by the crisis were often only able to obtain liquidity via their respective central banks. The Eurosystem stepped into the breach and substituted private capital flows in order to safeguard the refinancing of the national banking systems. This was reflected in the national central banks' high TARGET2 balances. Cross-border sharing of private risks via credit markets largely failed to materialise. Moreover, in the countries hardest hit by the crisis, the share of banks' equity capital held by foreign investors was low. This limited the potential sharing of risks via international banking markets.¹⁹

Capital markets union has potential to help strengthen risk sharing and financial stability in the EU

Together with the concentration of risks in the banking sector, the high proportion of volatile debt capital flows among the international capital movements of euro-area countries is a potential source of financial stability risks and could weaken cross-border risk sharing in the euro area. One reason for the high proportion of debt capital is the particularly pronounced information asymmetries between investors and enterprises in international capital markets. In essence, enterprises' financing struc-

¹⁵ See F Balli, S Kalemli-Ozcan and B E Sorensen (2012).

¹⁶ See P Asdrubali, B E Sorensen and O Yosha (1996).

¹⁷ See S Kalemli-Ozcan, E Luttini and B E Sorensen (2014).

¹⁸ See F Allen, T Beck, E Carletti, P R Lane, D Schoenmaker and W Wagner (2011).

¹⁹ See C M Buch, T Körner and B Weigert (2015).

tures and the composition of cross-border capital flows are shaped by market processes. However, the question arises as to whether decisions made by enterprises and investors are distorted by existing frameworks.

The creation of a European capital markets union provides an opportunity to identify and remove distortions affecting investment and financing decisions. The objective should not be to establish a certain politically desired finance structure, but rather to create a framework in which the markets can operate efficiently.

The capital markets union provides an opportunity to identify and remove distortions affecting investment and financing decisions.

Remove obstacles to capital market development and integration

A number of individual measures addressing obstacles in various markets are necessary in order to strengthen and integrate capital markets in Europe.

A number of individual measures addressing obstacles in various markets are necessary in order to strengthen and integrate capital markets.

For example, the revision of the Prospectus Directive,²⁰ which is already under way, could make it easier for potential issuers to gain access to the capital markets. In addition, harmonised frameworks for capital market products (eg securitisations, private placements or covered bonds) could facilitate the development and integration of the various markets. Existing quality standards in functioning markets (such as for covered bonds) should be maintained.

Special significance should be attached to removing obstacles to the development and integration of European equity capital markets in the capital markets union. The potential for further development varies from segment to segment in the equity capital market. While stock markets in Europe are already well integrated, other market segments have a considerable amount of catching up to do. Dismantling institutional barriers to mergers and acquisitions (M&A), for instance, would spur on cross-border equity capital investment. The discretion given to member states in implementing the European Takeover Directive²¹ or the legal options available to national governments to block M&A transactions can give rise to obstacles in this regard. Moreover, an analysis should be carried out as to whether corporate governance regulations (eg special voting rights for shares) impede M&A.

The development and integration of European venture capital markets is a source of further potential for boosting equity financing. There are only a few functioning venture capital markets in the EU, and the volume of cross-border investment is low. This is attributable, on the one hand, to the low number of experienced venture capital managers and, on the other, to the low number of potential portfolio enterprises in many member states. Identifying best practices in promoting research and development and facilitating the foundation of start-up businesses would increase the number of potential portfolio enterprises for venture capital funds. Moreover, public

The development and integration of European venture capital markets has the potential to boost equity financing.

²⁰ The Prospectus Directive (Directive 2003/71/EC of the European Parliament and of the Council of 4 November 2003) stipulates the form and content of the prospectuses that securities issuers must publish.

²¹ See Directive 2004/25/EC of the European Parliament and of the Council of 21 April 2004.

or market-based initiatives could help enterprises fulfil the requirements laid down by venture capital funds. An improved environment for equity issuance and M&A transactions could also increase the supply of venture capital in Europe, as it would make it easier for investors to subsequently exit their investments.

Reduce false incentives for debt financing

Not only can institutional and regulatory incentives affect decisions about cross-border investments, they can also distort the financing decisions made by individual enterprises. For example, the unequal tax treatment of equity capital and debt capital results in false incentives to take on excessive amounts of debt. According to most tax codes in Europe, enterprises' debt costs are tax deductible. Such tax incentives influence enterprises' investment and financing decisions.²² As proposed by the European Commission in its action plan of 30 September 2015, the creation of the capital markets union should be accompanied by efforts to establish equal tax treatment for equity capital and debt capital on an EU-wide basis.

Scale back dependency on the banking sector as a risk-sharing channel

It will be vitally important that banks are able to fulfil their function as financial intermediaries without financial stability risks arising as a result. For example, revitalising the securitisation market in Europe could enable banks to reduce uncertainty in the lending process regarding enterprises' business situation and risks. The securitisation of claims from granted loans would subsequently enable the partial transfer of credit risks to capital market investors and hinder any concentration of risks in the banking sector.

However, in order to prevent the emergence of financial stability risks, the regulatory framework for securitisations should not set any false incentives. It is therefore important that banks that securitise credit claims still have incentives to observe high credit standards. At the same time, investors should not be given incentives to dispense with in-depth risk assessments for their investments in securitisations. To this end, it is essential that transparency requirements for securitisations be further enhanced.

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²² See R A de Mooij (2011) and L P Feld, J H Heckemeyer and M Overesch (2013).

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■ Chronology of macroprudential policy measures

- German Financial Stability Committee (*Ausschuss für Finanzstabilität*)
- European Systemic Risk Board (ESRB)
- Measures in other EU countries

■ 2014¹

8 December 2014 **The United Kingdom reduces capital requirements for small and medium-sized investment firms**

The Financial Policy Committee of the Bank of England exempts small and medium-sized investment firms from the capital requirements resulting from the countercyclical capital buffer and the capital conservation buffer.²

■ 2015

7 January 2015 **The Netherlands reciprocates higher risk weights for residential mortgages in Belgium**

De Nederlandsche Bank reciprocates the higher risk weights for residential mortgages in Belgium pursuant to Article 458 (5) of the Capital Requirements Regulation (CRR). This measure is expected to have only a minor impact as Dutch banks' activities in Belgium are limited.

15 January 2015 **Croatia sets countercyclical capital buffer**

The Croatian authorities set the countercyclical capital buffer at 0%.³ The measure is to be applied as of 1 January 2016 and is justified by a negative credit-to-GDP gap (-13 percentage points) and a buffer guide of 0%.

¹ Measures up to and including 21 November 2014 are outlined in the 2014 Financial Stability Review.

² All notifications can be found on the ESRB's website: <http://www.esrb.europa.eu>

³ Unless otherwise stated, percentages for capital requirements refer to common equity tier 1 capital as a share of risk-weighted assets.

20 January 2015 **Denmark sets countercyclical capital buffer and reciprocates the buffers of other member states that have chosen a shorter transitional period**

The countercyclical capital buffer is set by the Danish authorities at 0% and will apply as of 1 January 2016. The decision is based on a qualitative assessment which finds, *inter alia*, a sharply negative credit-to-GDP gap and a buffer guide of 0%. In addition, Denmark reciprocates the countercyclical capital buffers of other member states of the European Economic Area (EEA) that have chosen a shorter transitional period.

4 February 2015 **Latvia sets countercyclical capital buffer**

The countercyclical capital buffer is set by the Latvian authorities at 0% and will apply as of 1 February 2016. The decision is justified by a negative credit-to-GDP gap (-36.2 percentage points) and a buffer guide of 0%.

6 February 2015 **The Czech Republic sets countercyclical capital buffer**

The buffer is set at 0% and will come into effect for banks, credit unions and investment firms as of 1 January 2016. The decision is based on a qualitative assessment which finds, *inter alia*, a negative credit-to-GDP gap (-2.6 percentage points) and a corresponding buffer guide of 0%.

20 February 2015 **The Netherlands identifies one financial institution as a G-SII**

ING Bank N.V. is identified as a global systemically important institution (G-SII). In line with the list⁴ updated annually by the Financial Stability Board, ING Bank is reported in the lowest of the five sub-categories.⁵ The capital requirements are thus raised by 1 percentage point. As a result of transitional periods, the additional capital that ING Bank N.V. is required to hold in 2016 amounts to 0.25%.

⁴ See Financial Stability Board, Update of list of global systemically important banks (G-SIBs), November 2014.

⁵ See Basel Committee on Banking Supervision, Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement, July 2013.

27 February 2015 **The United Kingdom identifies four financial institutions as G-SIIs**

The Prudential Regulation Authority of the Bank of England identifies HSBC (sub-category 4), Barclays (sub-category 3), the Royal Bank of Scotland (sub-category 2) and Standard Chartered (sub-category 1) as global systemically important institutions. Consequently, the four institutions have to increase their capital ratios by 2.5 percentage points, 2 percentage points, 1.5 percentage points and 1 percentage point, respectively. Due to the gradual implementation, only 25% of this additional capital buffer has to be maintained in 2016.

2 March 2015 **France identifies four financial institutions as G-SIIs**

The French Autorité de Contrôle Prudentiel et de Résolution identifies BNP Paribas (sub-category 3) as well as Société Générale, Groupe BPCE and Groupe Crédit Agricole (sub-category 1) as global systemically important institutions. Consequently, BNP Paribas has to maintain an additional capital buffer of 2% and the other three institutions of 1%. As a result of transitional periods, only one-quarter of these buffers has to be maintained in 2016.

2 March 2015 **Italy identifies one financial institution as a G-SII**

The Italian authorities identify Unicredit Group spa as a global systemically important institution (sub-category 1). Consequently, the institution has to increase its capital requirements by 1 percentage point. As a result of transitional periods, Unicredit Group spa only has to maintain 25% of this additional buffer in 2016.

10 March 2015 **The ESRB publishes its report on the regulatory treatment of sovereign exposures**

The ESRB report presents a systematic analysis of the sovereign exposures held by banks and insurers and the associated macroprudential risk. The report comes to the conclusion that the current regulatory treatment of sovereign exposures has contributed to excessive investment by monetary financial institutions in sovereign exposures. The report contains various reform options.⁶

⁶ See European Systemic Risk Board, ESRB report on the regulatory treatment of sovereign exposures, March 2015.

20 March 2015 **Denmark exempts small and medium-sized investment firms from certain capital requirements**

Investment firms with fewer than 250 employees and either an annual turnover of less than €50 million or total assets of less than €43 million are exempted from the capital requirements resulting from the countercyclical capital buffer and the capital conservation buffer.

27 March 2015 **Finland sets countercyclical capital buffer and makes use of the option not to activate various other macroprudential instruments**

Finland sets the countercyclical capital buffer at 0%. Furthermore, it decides not to use instruments to tighten capital requirements for mortgages pursuant to Article 124 CRR nor to tighten capital requirements pursuant to Articles 164 and 458 CRR.

27 March 2015 **Hungary limits maturity mismatch for mortgages**

The central bank of Hungary stipulates that as of 1 July 2016 financial institutions must back at least 15% of mortgages issued in forint with mortgage-backed long-term liabilities denominated in forint.

8 April 2015 **The United Kingdom reciprocates Hong Kong's countercyclical capital buffer**

The Bank of England will reciprocate the countercyclical capital buffer of 0.625% set by the Hong Kong authorities for exposures located in Hong Kong with effect from 27 January 2016.

14 April 2015

Hungary changes existing and creates new macroprudential instruments to limit currency and maturity mismatches

In order to reduce the banking system's dependence on short-term foreign currency loans, the central bank of Hungary no longer recognises foreign exchange swaps in the existing foreign exchange funding adequacy ratio (FFAR). This brings the FFAR closer into line with the net stable funding ratio (NSFR), established as part of Basel III, and aids in the move towards backing all long-term foreign currency loans with long-term foreign currency liabilities, which is to be concluded by 1 October 2015. In addition, the permissible currency mismatch between assets and liabilities is set at 15% of total assets.

14 April 2015

The ESRB presents a follow-up report on the implementation of its recommendation on US dollar-denominated funding of credit institutions

The report provides an assessment of the implementation of the ESRB's recommendation issued in 2011 by the various EU member states. The ESRB assigns Germany and a further 15 of the 28 member states assessed the grade "fully compliant". Three member states are graded "largely compliant" and a further nine member states are found to have "sufficiently explained" deviations from the recommendation.⁷

23 April 2015

Lithuania sets countercyclical capital buffer and capital conservation buffer

Lithuania introduces the countercyclical capital buffer and the capital conservation buffer without any transitional provisions. While the amount of the countercyclical capital buffer to be maintained as of 2016 has yet to be set and notified, the capital conservation buffer has to be maintained in the full amount of 2.5% as of 30 June 2015.

24 April 2015

Lithuania introduces an exemption regulation for the countercyclical capital buffer for small and medium-sized investment firms

Certain small and medium-sized investment firms are exempted from the capital requirements resulting from the countercyclical capital buffer.

⁷ See European Systemic Risk Board, Recommendation on US dollar denominated funding of credit institutions, Follow-up report – overall assessment, April 2015.

29 April 2015

Slovakia reciprocates countercyclical capital buffers with shorter transitional periods and exempts small and medium-sized investment firms from certain capital requirements

The National Bank of Slovakia reciprocates the countercyclical capital buffers of other EEA states that have chosen shorter transitional periods. It also exempts small and medium-sized investment firms from the capital requirements resulting from the countercyclical capital buffer and the capital conservation buffer.

5 May 2015

Germany identifies one financial institution as a G-SII

The Federal Financial Supervisory Authority (BaFin), in agreement with the Deutsche Bundesbank, identifies Deutsche Bank as a global systemically important institution and requires that this institution maintain an additional capital buffer consisting of common equity tier 1 capital of 2%. This capital buffer is to be implemented gradually as of 1 January 2016 and consequently only 25% thereof must be maintained in 2016.

13 May 2015

Italy announces early introduction of capital conservation buffer and exempts small and medium-sized investment firms from this requirement

The Bank of Italy announces that a capital conservation buffer of 2.5% has been in force since 1 January 2014. Small and medium-sized investment firms are exempted from this requirement.

2 June 2015

The ESRB publishes an overview of national macroprudential authorities

The overview provides information about the national competent or designated authorities for the various macroprudential instruments in all EU member states.⁸

⁸ See European Systemic Risk Board, National competent or designated authorities for CRD IV/CRR instruments and current or future implementation of macroprudential instruments, June 2015.

4 June 2015

Slovakia identifies five institutions as O-SIIs and activates the systemic risk buffer

The National Bank of Slovakia sets a capital buffer for other systemically important institutions (O-SIIs). As of 1 January 2016, a buffer of 1% is to be implemented for five other systemically important institutions. This is to apply to all relevant exposures. In addition, the systemic risk buffer is activated for relevant domestic exposures on an individual and sub-consolidated basis.

16 June 2015

The Czech Republic recommends stricter provisions for residential mortgages

The Czech National Bank recommends that institutions maintain a loan-to-value limit of 90% for all retail loans secured by residential property and a loan-to-value limit of 100% only for a maximum of 10% of new retail loans secured by residential property as well as set internal additional limits regarding a borrower's ability to service loans and their level of debt.

23 June 2015

Sweden identifies one financial institution as a G-SII

The Swedish authorities identify Nordea Bank AB as a global systemically important institution (sub-category 1). Finansinspektionen, the Swedish Financial Supervisory Authority, thus sets an additional capital buffer of 1%, 25% of which is to be maintained in 2016.

23 June 2015

The ESRB presents a follow-up report on the implementation of its recommendation on lending in foreign currencies

The report provides an assessment of the implementation of the ESRB's recommendation issued in 2011 by the various addressees. The ESRB assigns Germany and a further 12 of the 28 member states assessed the grade "fully compliant". 14 member states are graded "largely compliant". Only in Bulgaria is the implementation deemed "partially compliant", as in the ESRB's November 2013 follow-up report.⁹

⁹ See European Systemic Risk Board, Recommendation on lending in foreign currencies, Follow-up report – overall assessment, June 2015.

25 June 2015 **The ESRB publishes a report on macroprudential leverage ratio buffers for financial institutions**

This report is an addendum to the handbook on using macroprudential instruments that was published in 2014 and looks at the macroprudential use of instruments to limit financial institutions' leverage.¹⁰

25 June 2015 **The ESRB publishes a report on misconduct risk in the banking sector**

The report looks at the macroprudential dimension of risks arising from misconduct. It analyses misconduct when dealing with customers and investors, when selling financial products, when complying with provisions and when manipulating markets. The report also makes a number of proposals as to how such risk can be addressed at the regulatory level.¹¹

25 June 2015 **The ESRB publishes its annual report on macroprudential policy**

The report documents the macroprudential measures that EU member states have taken one year after the introduction of CRR and the Capital Requirements Directive IV (CRD IV). Overall, around half of the approximately 100 measures were directly binding in economic terms. The measures were based partly on national law and partly on Union law. The focus of these measures was on preventing and mitigating excessive credit growth and leverage, excessive maturity mismatches and misaligned incentives.¹²

¹⁰ See European Systemic Risk Board, Handbook on operationalising macroprudential policy in the banking sector/Addendum on macroprudential leverage ratios, June 2015.

¹¹ See European Systemic Risk Board, Report on misconduct risk in the banking sector, June 2015.

¹² See European Systemic Risk Board, A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR, June 2015.

3 July 2015

Germany recommends creating new macroprudential instruments for residential real estate financing and informs the ESRB accordingly

In its recommendation of 30 June, the Financial Stability Committee recommends that the Federal Government create a legal foundation for new macroprudential instruments to restrict the granting of loans to build or acquire domestic residential real estate secured by a mortgage.¹³

6 July 2015

Finland identifies four financial institutions as O-SIIs

Nordea Bank Finland Plc, OP Group, Danske Bank Plc and Municipality Finance Plc are identified as other systemically important institutions. As of 7 January 2016, they will have to maintain an additional capital buffer of 2% (Nordea and OP Group) or 0.5% (Danske Bank and Municipality Finance).

6 July 2015

The United Kingdom reciprocates countercyclical capital buffers set by Sweden and Norway

The British authorities will fully reciprocate the countercyclical capital buffer rates of 1.5% in Sweden and Norway as of 27 July 2016 (Sweden) and 30 July 2016 (Norway).

10 July 2015

Hungary brings forward the introduction of the liquidity coverage ratio

Hungarian institutions will be required to maintain a liquidity coverage ratio of 100% as of 1 April 2016.

13 July 2015

Sweden reciprocates countercyclical capital buffers of other countries

Sweden will reciprocate all countercyclical capital buffer rates set by other EEA countries up to 2.5% as of 11 August 2015.

¹³ See Financial Stability Committee, Recommendation of 30 June 2015 on new instruments for regulating loans for the construction or purchase of residential real estate, June 2015.

17 July 2015

Croatia exempts small and medium-sized investment firms from certain capital requirements

Small and medium-sized investment firms are exempted from the capital requirements resulting from the countercyclical capital buffer and the capital conservation buffer.

20 July 2015

The ESRB publishes its 2014 Annual Report

The Annual Report contains a detailed assessment of the risks to financial stability. It also provides an overview of the ESRB's work during the reporting period, ie from 1 April 2014 to 31 March 2015. One of the ESRB's key activities was to coordinate the new EU legal acts on banking regulation (CRD IV/CRR), which came into force during the reporting period. It also focused on the regulatory treatment of sovereign exposures.¹⁴

29 July 2015

The ESRB publishes reports on the revision of the EU Regulation EMIR

As part of the public consultation to review EU Regulation No 648/2012 (European Market Infrastructure Regulation: EMIR), the ESRB publishes a report on the efficiency of margining requirements and collateral haircuts to limit procyclical risks as well as an additional report containing proposals on how to improve other aspects of EMIR. The ESRB calls, *inter alia*, for clearer provisions in EMIR on how to avoid procyclical effects as well as a further EMIR review in 2018 to assess whether national supervisory authorities require any additional intervention capacities. The ESRB also makes the case for enhancing the transparency of central counterparties as well as broadening national supervisory authorities' access rights to trade repository data.^{15,16}

¹⁴ See European Systemic Risk Board, Annual Report 2014, July 2015.

¹⁵ See European Systemic Risk Board, Report on the efficiency of margining requirements to limit pro-cyclicality and the need to define additional intervention capacity in this area, July 2015.

¹⁶ See European Systemic Risk Board, Report on issues to be considered in the EMIR revision other than the efficiency of margining requirements, July 2015.

17 August 2015 **Lithuania decides not to impose any transitional provisions for the introduction of the countercyclical capital buffer**

The positive buffer rates set in Lithuania and those up to 2.5% set by other member states that have also chosen a shorter transitional period must be maintained in full as of 30 June 2015.

27 August 2015 **The ESRB publishes a decision on information that it requires**

The ESRB publishes a list of the data that it requires to perform its tasks. The list is broken down according to the parties that are required to provide the data.¹⁷

14 September 2015 **Portugal decides not to impose any transitional provisions for the capital conservation buffer**

Portuguese institutions will be required to maintain a capital conservation buffer of 2.5% as of 1 January 2016.

20 October 2015 **Denmark publishes methodology used to determine O-SIIs and activates systemic risk buffer**

The Danish authorities identify institutions as other systemically important institutions in one of five sub-categories if their total assets exceed 6.5% of GDP, if their share of domestic lending exceeds 5% or if the share of domestic deposits held exceeds 5%. Depending on the sub-category, the institution has to maintain a systemic risk buffer of between 1% and 3%. In line with this methodology, DLR Kredit and Sydbank have to maintain a systemic risk buffer of 1%, Jyske Bank of 1.5%, Nordea Bank Danmark and Nykredit Realkredit of 2% and Danske Bank of 3%. This will come into effect in stages as of 2015 with the full amount applying as of 2019.

¹⁷ See European Systemic Risk Board, Decision of the European Systemic Risk Board of 21 July 2015 on the provision and collection of information for the macroprudential oversight of the financial system within the Union and repealing Decision ESRB/2011/6, August 2015.

26 October 2015 **Belgium identifies eight financial institutions as O-SIIs**

As of 1 January 2016, the financial institutions identified as other systemically important institutions have to maintain an additional capital buffer of 0.25% (Axa Bank Europe, Argenta Spaarbank, The Bank of New York Mellon, Euroclear Bank) or 0.5% (Belfius Bank, BNP Paribas Fortis, KBC Bank, ING België).

10 November 2015 **Spain identifies two financial institutions as G-SIIs**

Banco de España informs the ESRB that Santander and BBVA have been identified as global systemically important institutions. Consequently, they have to maintain an additional capital buffer of 1%.

■ Glossary

AIF	Alternative Investment Fund
BaFin	Federal Financial Supervisory Authority
BLS	Bank Lending Survey
BRRD	Bank Recovery and Resolution Directive
CCB	Countercyclical Capital Buffer
CCP	Central Counterparty
CGFS	Committee on the Global Financial System
CRD IV	Capital Requirements Directive IV
CRR	Capital Requirements Regulation
EBA	European Banking Authority
ECB	European Central Bank
EL	Expected Loss
ESCB	European System of Central Banks
ESM	European Stability Mechanism
ESRB	European Systemic Risk Board
ETF	Exchange-Traded Fund
EU	European Union
FCL	Financial Corporation Engaged in Lending
FSB	Financial Stability Board
FVC	Financial Vehicle Corporation
G-SIB	Global Systemically Important Bank
G-SII	Global Systemically Important Insurer
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IRBA	Internal Ratings-Based Approach
LGD	Loss Given Default
LTV	Loan to Value (loan amount in relation to the market value of a property)
M&A	Mergers and Acquisitions
MFI	Monetary Financial Institution
MREL	Minimum Requirement for Own Funds and Eligible Liabilities (minimum requirements to have adequate loss-absorbing capacity in the form of own funds and eligible liabilities in the event of resolution)
OFI	Other Financial Institution
OTC	Over-the-Counter
PD	Probability of Default
PSPP	Public Sector Purchase Programme
RWA	Risk-Weighted Assets
SDD	Securities and Derivatives Dealer
SRM	Single Resolution Mechanism

SSM	Single Supervisory Mechanism
TLAC	Total Loss-Absorbing Capacity
UCITS	Undertakings for Collective Investment in Transferable Securities
UFR	Ultimate Forward Rate

Bundesbank publications concerning financial stability

This overview lists selected recent Bundesbank publications on the subject of financial stability. The Financial Stability Review and the Monthly Report are available in both German and English, while most discussion papers are only available in English. The publications are available free of charge to interested parties and may be obtained from the Bundesbank's External Communication Division. They are also available online. Additionally, a CD-ROM containing roughly 40,000 published Bundesbank time series, which is updated monthly, may be obtained for a fee from the Bundesbank's Statistical Information Management and Mathematical Methods Division or downloaded from the Bundesbank's ExtraNet platform. Orders should be sent in writing to the addresses given in the imprint. Selected time series may also be downloaded from the Bundesbank's website.

Financial Stability Reviews

Financial Stability Review, November 2014
Financial Stability Review, November 2013
Financial Stability Review, November 2012
Financial Stability Review, November 2011
Financial Stability Review, November 2010
Financial Stability Review, November 2009
Financial Stability Review, November 2007
Financial Stability Review, November 2006
Financial Stability Review, November 2005

Articles from the Monthly Report

November 2015	Monetary policy and banking business
October 2015	German households' saving and investment behaviour in the light of the low-interest-rate environment
September 2015	The performance of German credit institutions in 2014 Recent developments in loans to euro-area non-financial corporations
August 2015	Monetary policy and banking business
July 2015	Slowdown in growth in the emerging market economies
June 2015	Marketable financial instruments of banks and their role as collateral in the Eurosystem
May 2015	Monetary policy and banking business

April 2015	The importance of macroprudential policy for monetary policy
March 2015	Approaches to strengthening the regulatory framework of European monetary union
February 2015	Monetary policy and banking business
January 2015	The Common Credit Assessment System for assessing the eligibility of enterprises
November 2014	Monetary policy and banking business

■ Discussion papers

38/2015	The credit quality channel: modeling contagion in the interbank market	Kilian Fink, Ulrich Krüger, Barbara Meller, Lui-Hsian Wong
36/2015	Asymmetric credit growth and current account imbalances in the euro area	Robert Unger
34/2015	On the exposure of insurance companies to sovereign risk – portfolio investments and market forces	Robert Düll, Felix König, Jana Ohls
32/2015	The winner’s curse – evidence on the danger of aggressive credit growth in banking	Thomas Kick, Thilo Pausch, Benedikt Ruprecht
31/2015	Out of sight, out of mind? On the risk of sub-custodian structures	Thomas Droll, Natalia Podlich, Michael Wedow
30/2015	A macroeconomic reverse stress test	Peter Grundke, Kamil Pliszka
29/2015	German labor market and fiscal reforms 1999 to 2008: can they be blamed for intra-euro area imbalances?	Niklas Gadatsch, Nikolai Stähler, Benjamin Weigert
25/2015	Cutting the credit line: evidence from Germany	Stefan Goldbach, Volker Nitsch
24/2015	The intraday interest rate – what’s that?	Puriya Abbassi, Falko Fecht, Johannes Tischer
23/2015	Many a little makes a mickle: macro portfolio stress test for small and medium-sized German banks	Ramona Busch, Philipp Koziol, Marc Mitrovic
22/2015	Characterizing the financial cycle: evidence from a frequency domain analysis	Christian R Proaño, Till Strohsal, Jürgen Wolters
21/2015	Cross-border banking and business cycles in asymmetric currency unions	Lena Dräger, Christian R Proaño
20/2015	The synchronization of European credit cycles	Barbara Meller, Norbert Metiu
19/2015	Calculating trading book capital: is risk separation appropriate?	Peter Raupach
18/2015	Multinational banks’ deleveraging in the crisis driven by pre-crisis characteristics and behavior	Rainer Frey
16/2015	Banks’ net interest margin and the level of interest rates	Ramona Busch, Christoph Memmel
12/2015	Lethal lapses – how a positive interest rate shock might stress German life insurers	Mark Feodorina, Till Förstemann
10/2015	The interest rate pass-through in the euro area during the sovereign debt crisis	Julia von Borstel, Sandra Eickmeier, Leo Krippner

09/2015	Do exposures to sagging real estate, subprime or conduits abroad lead to contraction and flight to quality in bank lending at home?	Steven Ongena, Günseli Tümer-Alkan, Natalja von Westernhagen
08/2015	Securities trading by banks and credit supply: micro-evidence	Puriya Abbassi, Rajkamal Iyer, José-Luis Peydró, Francesc R Tous
07/2015	Imperfect information about financial frictions and consequences for the business cycle	Josef Hollmayr, Michael Kühl
05/2015	German and the rest of euro area fiscal policy during the crisis	Niklas Gadatsch, Klemens Hauzenberger, Nikolai Stähler
04/2015	Financial frictions and global spillovers	Michael Grill, Björn Hilberg, Norbert Metiu
46/2014	Banking market structure and macroeconomic stability: are low-income countries special?	Franziska Bremus, Claudia M Buch
45/2014	Cross-border liquidity, relationships and monetary policy: evidence from the Euro area interbank crisis	Puriya Abbassi, Falk Bräuning, Falko Fecht, José-Luis Peydró
44/2014	A network view on interbank market freezes	Silvia Gabrieli, Co-Pierre Georg
39/2014	Loan loss provisioning and procyclicality: evidence from an expected loss model	Sven Bornemann, Christian Domikowsky, Klaus Duellmann, Andreas Pfingsten
38/2014	Taxing banks: an evaluation of the German bank levy	Claudia M Buch, Björn Hilberg, Lena Tonzer
37/2014	Decomposition of country-specific corporate bond spreads	Niko Dötz
36/2014	What predicts financial (in)stability? A Bayesian approach	Judith Eidenberger, Benjamin Neudorfer, Michael Sigmund, Ingrid Stein
35/2014	Financial conditions, macroeconomic factors and (un)expected bond excess returns	Christoph Fricke, Lukas Menkhoff
32/2014	Pro-cyclical capital regulation and lending	Markus Behn, Rainer Haselmann, Paul Wachtel

