Structural developments in the German banking sector

The financial and sovereign debt crisis which has afflicted the euro area for more than seven years now has clearly left a mark on the financial market, having prompted monetary policymakers to roll out highly accommodative measures and legislators to make adjustments to the regulatory framework. These changes have fundamentally transformed the landscape, particularly for the banking sector.

This article starts out by looking back at developments prior to the financial crisis before turning to the post-2007 era to shed light on the interplay between regulation, monetary policy and market behaviour as well as their impact on banks' business models. In so doing, it will focus on banks' asset and liability structures, looking particularly into the forms of funding used by German banks.

The wave of financial market deregulation unleashed from the 1990s onwards, combined with the European integration process, had a transformative impact on banks' business models, especially so among larger institutions in Germany. One of the effects of deregulation was to allow banks in Germany to make greater use of market-based funding and broaden their investment banking operations. This was a catalyst for a spell of stellar growth spearheaded by larger German institutions. Smaller banks, on the other hand, tended to be overshadowed by this global phenomenon and stuck to their traditional lines of banking business.

The financial crisis put an end to larger institutions' wave of expansion, which had been focused on capital market business and investment banking and fuelled by institutional funding from banks, insurers, investment funds and money market funds etc. Added to this, the most recent regulatory initiatives define concrete requirements for the structure of banks' funding and aim to ensure that banks have sufficient loss-absorbing capacity, besides introducing, for the first time, a facility for resolving larger credit institutions. This newly created regulatory regime, if rigorously applied, could take pressure off fiscal and monetary policy going forward.

The slump in credit institutions' earnings brought about by the crisis, the transformation of the financial market landscape and reforms to banking regulation have forced Germany's banking sector as a whole to downsize proprietary trading, refocus on core business operations and substitute capital market funding with deposits. This marked the first tentative steps towards reversing the very developments that had been observed in the run-up to the crisis.

In recent years, larger German banks in particular have barely managed to generate sufficient income to build up capital through retained earnings. But the ability to do so is a key prerequisite for a sustainable business model. Only banks which satisfy this requirement in the long run are fully capable of serving their function as providers of finance to the economy.

Structure of the German banking system

Germany's universal banking system

Universal banks – institutions offering a broad repertoire of products and services around a core of traditional deposit-financed lending business – are a hallmark of Germany's banking landscape. They exist alongside specialised banks, which are often affiliated with a universal bank and normally run a narrow business model focusing on selected transactions (*inter alia* building and loan associations and mortgage banks).

Categorisation of business models

Three-dimensional analysis of bank business models

In principle, bank business models can be characterised in three dimensions, the main one being the asset and liability structure, ie a bank's funding sources and lending activities (see the chart on page 37). The funding mix is one of the main factors used to categorise banks in that dimension.[1] Given that a bank's business activities have a major bearing on its earnings structure, which is the second dimension, it is also possible to differentiate between business models in terms of their profitability and risk profile. The third dimension is the institution's legal form, which can largely dictate an individual bank's size, the number of similarly structured institutions and branches as well as the density of the branch network.[2] In this dimension, German banks can be broken down into the country's three-pillar structure, comprising private commercial banks, public sector institutions and institutes in the cooperative sector. For statistical reporting purposes, the banking system is divided into what are known as categories of banks, to which institutions are assigned depending on the nature of their asset and liability structure[3] and their legal form. The most important categories of banks in Germany are big banks, Landesbanken, regional institutions of credit cooperatives, regional banks and other commercial banks, credit cooperatives and savings banks.

Business models of categories of banks: characteristics and development

How business models differ among categories of banks

The big banks stand out in the category of private commercial banks.[4] For the most part, their business operations and funding activities are strongly biased towards international operations and the capital markets, and they aim to make profits. Their activities include acting as the principal banking partners of Germany's major industrial enterprises. Many institutions in the category of regional banks and other commercial banks, on the other hand, tend to be smaller in size, with business models resembling those of savings banks and credit cooperatives.[5] Operating more within a particular region, these institutions mainly focus on supplying credit to non-financial corpor-

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1 See Bank for International Settlements (December 2014), Bank business models, Quarterly Review, pp 55-65; and R Ayadi and W P de Groen (2014), Banking Business Models Monitor 2014 – Europe, Centre for European Policy Studies and International Observatory on Financial Services Cooperatives.

2 A detailed description can be found, for instance, in T Hartmann-Wendels, A Pfingsten and M Weber (2015), Bankbetriebslehre, 6th edition Springer; and M Koetter (2013), Market structure and competition in German banking, Report commissioned by the Council of Economic Experts.

3 The data used in this article to analyse asset and liability structures are extracted from the Bundesbank's monthly balance sheet statistics for German banks (monetary financial institutions, or MFIs). These statistics cover all banks in Germany that are licenced to conduct both deposit-taking and lending business. They are primarily the following: (a) reports by banks operating in Germany with no legally dependent branches abroad; (b) partial reports by German banks operating a foreign branch network with data on their domestic branches; and (c) partial reports by foreign branches operated in Germany by non-resident banks. Not included are reports by foreign branches or by legally independent bank subsidiaries of German banks. The disclosure requirements governing the collection of reporting data are based on the rules set forth in Regulation ECB/2013/33 concerning the balance sheet of the monetary financial institutions sector. In Germany these requirements can be essentially traced back to the financial reporting standards under the German Commercial Code (Handelsgesetzbuch, or HGB) and the Accounting Regulation for Credit Institutions (Verordnung über die Rechnungslegung der Kreditinstitute und Finanzdienstleistungsinstitute, or RechKredV).

4 An itemised list of the institutions covered by the monthly balance sheet statistics can be found in Deutsche Bundesbank, Special Statistical Publication 1, Verzeichnisse.

5 The category of regional banks and other commercial banks comprises an extremely heterogeneous set of institutions, as well as including central counterparties and Germany-based subsidiaries of international banks.

Conceptual framework for distinguishing between business models*

***** Based on R Ayadi and W P de Groen (2014), Banking Business Models Monitor 2014 – Europe, Centre for European Policy Studies and International Observatory on Financial Services Cooperatives. **1** Traditional lending business with non-financial corporations and households funded using deposits. **2** Interbank and capital market business funded using short-term institutional deposits. **3** Strong focus on trading, geared to the international markets and the capital market.

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ations and households, using deposits as their primary source of funding. This makes them direct competitors of savings banks and credit cooperatives. Competition is likely to be less important, on the other hand, among savings banks (on account of the regional principle) and among credit cooperatives (owing to their close links with a particular region). Landesbanken, being the central institutions of savings banks, perform transactions which the savings banks themselves cannot, because they are either too small or operate only in a given region. They are therefore major players in the wholesale banking and capital market businesses, where they go head to head with large private commercial banks, first and foremost the big banks. Regional institutions of credit cooperatives, meanwhile, play a far more active role than the Landesbanken in redistributing liquidity among the affiliated primary institutions, meaning they operate chiefly in the interbank and capital market.

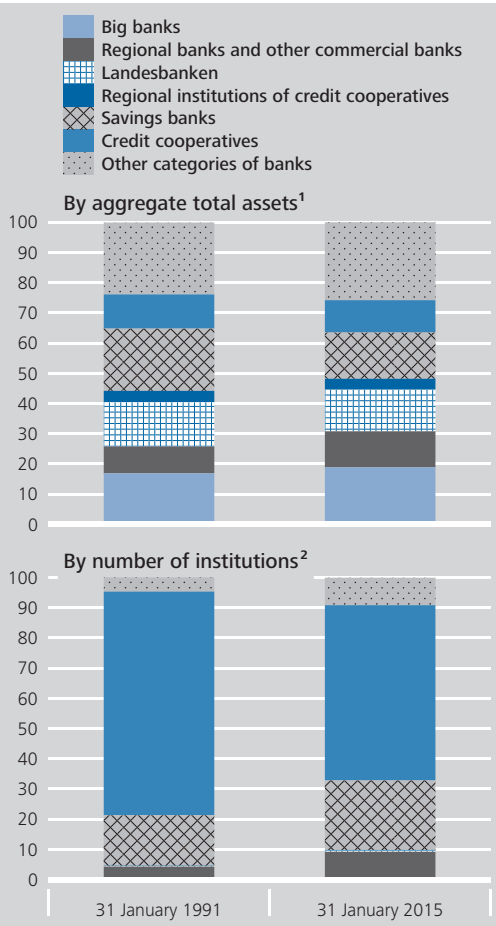
Bulk of smaller banks still regional and engaged in retail business

The business models of the smaller regional institutions have not changed fundamentally over the last 50 years. Their customer-centric approach, plus, in the case of the savings banks, a commitment to serving the public good, make dense regional coverage a necessity, hence the consistently high number of institutions and branches that can be found to this day in this category. More than three-quarters of credit institutions in Germany are savings banks or credit cooperatives, but their combined total assets make up less than a quarter of aggregate total assets in the German banking system. The process of consolidation which had been evident for some time gained traction in the 1990s, notably in the cooperative bank sector with its very large branch network, as credit institutions set out to streamline costs. Momentum waned after the turn of the millennium, however. Networked institutions,[6] which did not want to risk watering down their customer-centric approach by further downsizing their regional footprint, sought to spin off and merge certain business units as specialised entities as noiselessly as possible. But the fact remains that the aggregate number of institutions across all categories of banks shrank by more than half between 1990 and 2015. Advancing digitalisation has further eroded the importance of branches as a sales channel, while the pressure to reduce the cost base through economies of scale has fostered the spread of direct banking. Added to this, many institutions are increasingly looking to break into the online payments business as well.

6 These comprise savings banks and credit cooperatives.

Importance of each category of banks within the German banking system

%



1 Adjusted for the "derivative financial instruments in the trading portfolio" item. **2** The following categories of banks are difficult to identify in the above chart due to their small number: big banks 4 (5), Landesbanken 9 (11), regional institutions of credit cooperatives 2 (4). Figures in brackets as at 31 January 1999.

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Deregulation the catalyst for expansion of big banks

Larger banks differ from their smaller counterparts in that their business models have undergone transformative change over the past 20 years. Financial innovations, increased financial market integration and the deregulation of the financial markets, combined with banks' expansionary ambitions, enabled larger banks to expand their business franchise on an unprecedented scale. Market-based transactions opened the door to fresh sources of earnings and new forms of financing. The upturn in capital market financing was chiefly driven by four sets of financial market promotion legislation in Germany, the third of which, dating from 1998, had the greatest impact on the volume of bank debt issuance (see the box on pages 40 and 41). Although the new regulations were ostensibly addressed to asset management companies, which between 1998 and 2007 counted as credit institutions and thus fell within the scope of the German Banking Act (*Kreditwesengesetz*, or KWG),[7] there were no plans to apply the capital adequacy and liquidity rules (sixth KWG amendment) to these institutions.[8] Furthermore, the Third Financial Market Promotion Act paved the way for the inception of money market funds, and the resulting growth in the investor base was another factor which fuelled banks' capital market financing. The Fourth Financial Market Promotion Act from 2002 was followed by the Financial Market Promotion Plan, which centred around the 2004 Investment Modernisation Act *(Investmentmodernisierungsgesetz)*. The main thrust of this legislation was to authorise hedge funds in Germany and to ease the capital adequacy rules for asset management companies and investment stock corporations. In the banking sector, it was primarily larger institutions which used special purpose entities as a vehicle for the large-scale issue of securitised assets, including asset-backed securities and mortgage-backed securities, (see the chart on page 39). But the evolution of the legal landscape since the 1990s did more than just affect larger German banks' funding structures – it also radically transformed their entire business operations. One such change to the legal groundrules was the decision in 2001 to abolish state guarantees *(Gewährträgerhaftung)* and guarantors' responsibility for ensuring their institutions' solvency *(Anstaltslast)* in the Landesbanken

7 The 2007 amendments to the Investment Act (Investmentgesetz) did away with asset management companies' status as credit institutions. Furthermore, the entry into force of the German Capital Investment Code (Kapitalanlagegesetzbuch, or KAGB) in 2013 replaced the term asset management company (Kapitalanlagegesellschaft) with capital management company (Kapitalverwaltungsgesellschaft).

8 See Y Bellavite-Hövermann, S Hintze, G Luz and P Scharpf, Handbuch Eigenmittel und Liquidität nach KWG, Schäffer-Poeschl Verlag, Stuttgart 2001, p 173. See also Federal Banking Supervisory Office, Announcement of the amendment of the Principles concerning the Own Funds and Liquidity of Institutions, 25 November 1998.

and savings bank sector, which entered into force in July 2005 following a transitional period lasting several years. In hindsight, some larger German banks were evidently so deeply invested in securitised assets that they were jeopardising their solvency. So besides achieving the desired effect of boosting the attractiveness of the German financial market, deregulation also acted as a catalyst for a not altogether sustainable expansion in market-based transactions.

Big banks grew particularly strongly

Both the emergence of market-based transactions alongside traditional banking business and the process of consolidation within the three pillars caused individual banks to swell in size and fuelled concentration within the banking sector. The larger a bank's original size, the more strongly it expanded its business franchise and enlarged its balance sheet. There are two reasons for this. One is that larger banks find it easier to boost their leverage, given that they are more likely to tap the capital markets. Another is that they have greater scope for diversifying their activities than do their smaller competitors, because they can harness economies of scale and scope for different business lines run side by side. This is precisely the development that was seen at the national level, particularly among big banks and Landesbanken but also at a number of larger institutions in the other categories of banks. It is not a phenomenon that is confined to Germany but a global trend in the growth of larger banks.[9]

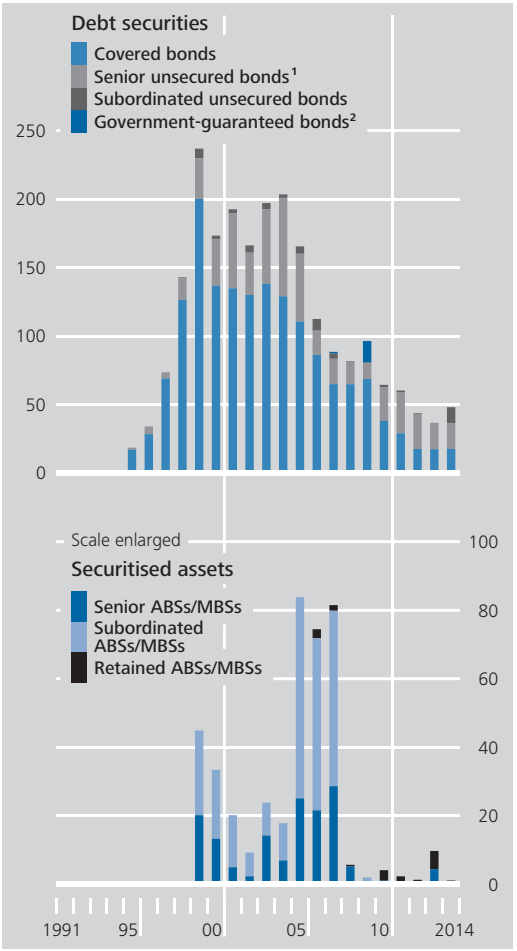
German banks' funding sources

Liabilities structure reflects assets

A bank's business model largely dictates the composition of the liabilities and assets on its balance sheet. Whereas traditional lending business commonly goes hand in hand with traditional deposits-based funding, a market-facing investment policy typically means making greater use of the money and capital market and of institutional investors as a source of funding. Diversification is the first rule of investing, and it is no less pertinent for funding. Being reliant on a single source of funding (or even an individual type of funding or a single creditor) is more risky for a bank's liquidity *ceteris paribus* than having a diversified portfolio of different funding sources.

Gross issuance of bank debt* by German credit institutions

Nominal values in € bn



Source: Dealogic and Bundesbank calculations. * Not including debt securities issued by institutions with a public mandate and by supranational institutions. **1** Not including short-dated senior bonds. **2** Government guarantees include guarantees by central, state and local governments.

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Banks mainly obtain funding from three sources: liabilities to non-banks, liabilities to the MFI sector[10] and securitised debt. The development of innovative financial market instruments

Deposits historically the main source of funding for banks

9 See L Laeven, L Ratnovski and H Tong (2014), Bank Size and Systemic Risk, IMF Discussion Note, May 2014.
10 These also include liabilities vis-à-vis the Eurosystem.

Major changes to German financial market regulation up to 2004[1]

1986
Issuance of certificates of deposit (CDs) authorised

Exchanges open up to electronic trading

1989
German Financial Futures Exchange (*Deutsche Terminbörse*, or DTB) established

February 1990
First Financial Market Promotion Act
(Erstes Finanzmarktförderungsgesetz)
- Stock exchange turnover tax abolished (from 1 January 1991)
- Capital duty and stamp duty abolished (from 1 January 1992)
- Wider range of corporate options and broader investment universe for asset management companies
  - Financial futures contracts and trading in equity and bond options authorised
  - Permission to hold liquidity in certain money market instruments
  - Limited-term bond funds authorised

December 1990
Securities Prospectus Act
(Wertpapier-Verkaufsprospektgesetz)
- Government authorisation procedure abolished for issues of bearer and order bonds
- Broader investment universe for insurers

1995
Second Financial Market Promotion Act
(Zweites Finanzmarktförderungsgesetz)
- Federal Supervisory Office for Securities Trading *(Bundesaufsichtsamt für den Wertpapierhandel)* established
- Regulations on insider trading
- Legal groundwork prepared for establishing commodity futures exchanges
- Money market funds investing up to 100% of their capital in money market instruments authorised
- Asset management companies allowed to invest in money market funds and engage in securities lending

1998
Third Financial Market Promotion Act
(Drittes Finanzmarktförderungsgesetz)
- New types of funds authorised[2]
- Asset management companies classified as credit institutions[3]
- Broader investment universe for asset management companies
  - Limited-term equity funds and equity index funds authorised
  - Investment opportunities in derivatives (up to 49% of contractual investment funds)
- Investor protection and supervisory toolkit improved

2000
Tax Reduction Act
(Steuersenkungsgesetz)
- Capital gains from sales of shares in incorporated enterprises exempted from tax

2002
Fourth Financial Market Promotion Act
(Viertes Finanzmarktförderungsgesetz)
- Official price fixing abolished[4]

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1 This box covers only developments of relevance to the main article. Some of the information contained herein no longer relates to applicable law.
2 Pension-based contractual investment funds, mixed securities and property-based contractual investment funds, funds of funds, and closed-ended funds in the legal form of a public limited company (investment stock corporation) were authorised for the first time. Unlike asset management companies, investment stock corporations were not deemed to be credit institutions pursuant to the German Banking Act (Kreditwesengesetz).
3 The classification of asset management companies as credit institutions was lifted in 2007. Only a small number of Banking Act provisions continue to be applicable to the enterprises which have been regulated since 2013 by the German Capital Investment Code (Kapitalanlagegesetzbuch), such as investment companies and capital management companies.

- Investor protection strengthened
- Asset management companies explicitly exempted from liquidity rules
- Mortgage banks allowed to expand business operations
  - Derivatives transactions authorised
  - Derivatives as cover assets authorised

2004
2006 Financial Market Promotion Plan *(Finanzmarktförderplan 2006)*
- Investment Modernisation Act *(Investmentmodernisierungsgesetz)*[5]
  - Measures affecting asset management companies: capital requirements eased (maximum of €10 million in capital required (initial capital and additional own funds), regardless of contractual investment fund size)
  - Unlimited scope to invest in derivatives[6]
  - Hedge funds authorised
  - Measures affecting investment stock corporations: initial capital reduced from DM2 million to €300,000

4 Exchange prices used to be determined by official brokers who were appointed by the stock exchange supervisory authority. Official brokers were independent trading brokers who participated in exchange trading and were assigned sole responsibility for a given segment in floor trading; they were responsible for determining official exchange prices in that segment. With the advent of the Fourth Financial Market Promotion Act, prices on securities exchanges were fixed either in electronic trading or by lead brokers licenced to determine exchange prices (Skontroführer).
5 Also includes the Investment Act (Investmentgesetz), which was a combination of the Act on Asset Management Companies (Gesetz über Kapitalanlagegesellschaften) and the Foreign Investment Act (Auslandsinvestment-Gesetz).
6 The contractual investment fund's market risk potential may no more than double through the use of derivatives.

since the 1990s has seen derivatives emerging as another major form of liability (eg liquidity swaps).[11] Liabilities to non-banks are the primary source of funds for Germany's banking system as a whole, funding almost 45% of aggregate total assets on a long-run average (since December 1968). Deposits by households and non-financial corporations account for the bulk of these liabilities (taking the form of overnight deposits, savings deposits and time deposits). Furthermore, insurers, which are mostly a source of long-term funding (*inter alia* registered bank bonds), are a major creditor group in the non-bank segment.[12] A further 25% of total assets on average are funded in the form of deposits by other MFIs (two-thirds domestically and one-third from abroad), with short-term interbank liabilities being used chiefly to settle liquidity in the money market. Yet over half of interbank liabilities are more long-term in nature, with an original life of two years or more. Besides intra-group or intra-network funding, these are primarily deposits by development banks. The third source of funding, bond issuance, makes up a further 20% of banks' funding on a long-run average. Banks use bank bonds to raise both short-term and long-term funds.

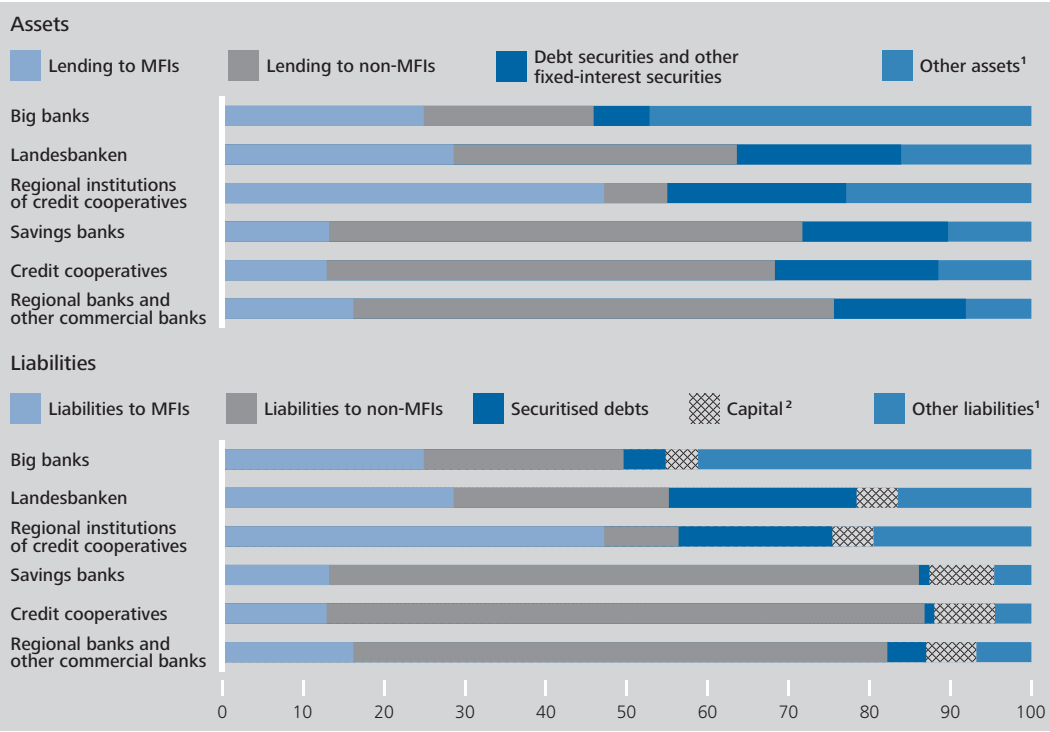
German banks with low reported equity ratio

Banks' own equity capital is another economically significant source of funding. Since a bank's business model typically implies a high level of debt, its equity ratio – capital as a percentage of total assets – is significantly lower than that of non-financial corporations. The German banking system's reported equity ratio amounts

11 See M Koetter (2013), op cit, p 20. Derivatives held in the trading portfolio have only been recorded in the balance sheet statistics since December 2010. See Deutsche Bundesbank, The performance of German credit institutions in 2010, Monthly Report, September 2011, pp 15-57.
12 See Deutsche Bundesbank, The shadow banking system in the euro area: overview and monetary policy implications, Monthly Report, March 2014, pp 15-34.

Asset and liability structure of selected categories of banks

Data as at 31 January 2015



1 Inter alia derivative financial instruments in the trading portfolio. **2** Subscribed capital, reserves, less reported loss, plus the "fund for general banking risks" item from the banking statistics.

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to a long-run average of roughly 4%,[13] which, by European standards, is well below mid-table.[14] This means that they have relatively high leverage ratios.

How the financing structure of the German banking sector evolved in the financial crisis

The collapse of capital market financing …

The financial crisis brought to a halt a trend, which had been unfolding since the 1990s, of financial market liberalisation characterised by rapidly growing interbank and capital markets. The new, and in many cases short-term, financing instruments showed their dark side, with banks suddenly facing high liquidity risk. The spread of the subprime crisis to the money market in summer 2007 and the Lehman Brothers failure in September 2008 made it at once more difficult and more expensive for banks, including German banks, to obtain finance on the interbank and capital markets. Although the German interbank market did not come entirely undone, the financial crisis radically changed the international funding environment, resulting, *inter alia*, in a change in perceptions of risk with regard to liquidity and counterparty default; one of the main consequences was that interbank transactions, which in many cases were unsecured before the crisis, were largely replaced by secured transactions.[15] The environment also deteriorated for new

13 The reported equity ratio is the sum of subscribed capital, reserves and the "fund for general banking risks" item as a percentage of total assets (see Deutsche Bundesbank, Banking Statistics, Statistical Supplement 1 to the Monthly Report, p 9).

14 Source: euro-area harmonised balance sheet statistics reported by the monetary financial institution (MFI) sector. It should be noted that national financial reporting standards can differ both in their definition of capital and in terms of total assets.

15 The trend towards secured lending began roughly around the turn of the millennium – and thus well before the outbreak of the financial crisis. See Deutsche Bundesbank, The financial system in transition: the new importance of repo markets, Monthly Report, December 2013, pp 57-71.

issues in the capital market since investors were demanding much greater risk premiums than in the past while, in addition, uncertainty was causing a quantitative deterioration in sales opportunities. At the same time, central bank refinancing became a considerably more attractive option for banks owing to the changeover of Eurosystem refinancing operations from variable-rate tenders to fixed-rate tenders with full allotment (beginning in October 2008) at the same time that the interest rate on main refinancing operations (MROs) fell drastically.[16] The non-standard monetary policy measures taken in response to the spread of the sovereign debt crisis and particularly the provision by the Eurosystem of long-term refinancing at very low rates at the end of 2011 and beginning of 2012 made capital market funding an increasingly costly proposition. This was one of the key reasons why new issues of bank debt and Pfandbriefe systematically failed to keep pace with redemption volumes. German banks' securitised debt subsequently contracted by nearly one-third (from their level in July 2007). Looking at the other bank debt securities, this decline was focused primarily on the medium maturity segment (having an initial maturity of over one and up to four years).[17]

… did not cause the German banking system to contract, …

Even though the financial crisis has been going on for over seven years, only the Landesbanken and mortgage banks – categories of banks which have been hit hard by restructuring and resolution – have seen their aggregated total assets contract significantly. This is also reflected in trends in the aggregated total assets of the German banking system as a whole.[18] Where German banks not belonging to either of these two categories sought capital market financing, the massive decline in securitised debt must have been made up for by other sources of funding since balance sheets were not shrunk. The targeted substitution of capital market financing by the banks themselves is, strictly speaking, possible only by expanding central bank refinancing or by a capital increase, as deposit-based finance cannot be managed directly by the banks but only indirectly by structuring the terms and conditions. To the banks, deposits therefore tend to be more of a "passive source of funds".

… but led to deposit-based financing as a substitute

However, non-bank-based financing has been undergoing a renaissance across all categories of banks. This is the only source of funding to grow in absolute terms since the outbreak of the financial crisis. A role has surely been played by the advantages of deposit-based financing over interbank liabilities and capital market finance: to the institutions, deposits are inexpensive, unsecured and – despite being callable at short notice – very stable, especially in Germany. The regulatory assessment (in connection, for instance, with liquidity regulation) goes in the same direction, thus helping to make this source of funds an increasingly enticing option. However, portfolio shifts (eg from bonds and equities to bank deposits) and the formation of new financial assets by German households are the primary reason why deposit-based financing grew across the board and not just among individual banks by poaching customer deposits from other institutions.[19]

Financing structure of German banks evolving since the financial crisis

Amidst the wide variety of business models in Germany's banking system, three identifiable characteristics run like a thread through the current financing structure of German banks. One is that liabilities to non-banks have become considerably more important since the financial crisis, though not nearly to the same extent as in the 1960s, when deposits were the primary source of funding not only for savings banks and credit cooperatives but also for com-

16 See Deutsche Bundesbank, Implications of the Eurosystem's monetary operations during the financial crisis, Monthly Report, April 2014, pp 37-59.
17 The category "other bank debt securities" comprises all debt securities excluding mortgage Pfandbriefe, public Pfandbriefe and debt securities issued by specialised credit institutions.
18 The decline in the aggregated total assets is visible even if one takes into account the countervailing effect of the Act to Modernise Accounting Law (Bilanzrechtsmodernisierungsgesetz) adopted in 2010, which introduced measures such as the accounting of derivatives in the trading portfolio.
19 See Deutsche Bundesbank, Change in households' assets and portfolio behaviour in Germany, Monthly Report, February 2014, pp 45-46.

mercial banks (big banks, regional banks and other commercial banks). The second characteristic is that, with the exception of customer deposits and intra-group or intra-association loans, there is hardly any unsecured funding left in banks' balance sheets. The third is that contractually agreed maturities were being shortened on the liabilities side during the financial crisis. The above-mentioned developments will be illustrated in greater detail for specific categories of banks below.

Big banks

Crisis called time on expansion of big banks' capital market and interbank funding …

Prior to the financial crisis, the interbank market and liabilities to non-banks, usually in the form of households' and non-financial corporations' deposits, each accounted for a little over one-third of big banks' funding. Securitised debt, by contrast, was far less material (12% of total assets). The financial crisis brought to a halt the expansion of big banks' interbank and capital market funding observed primarily in the 1990s. Since the onset of the crisis, the bottom has fallen out of the prices of securitised debt; since 2010, this debt has been continuously run off, which means that today balance sheets have only around two-thirds of their pre-crisis levels of securitised debt. In contrast to the decline in securitised funding, the interbank market – especially the foreign interbank market – has not relinquished any of its importance to big banks for their funding; the volume of their interbank debt is only marginally below pre-crisis levels. A little over one-third of debt consists of derivative financial instruments. However, it is impossible to reliably say whether this share has changed since the crisis, as the reporting of derivative financial instruments in the trading portfolio for the banks' monthly balance sheet statistics has been mandatory only since December 2010.[20] The primary purpose of derivatives is probably to generate profits and hedge against interest rate risk. Owing to their short-term nature, they are also an extremely flexible method of funding which enables liquidity risk to be managed to the exact day; its usage is accordingly highly volatile.[21] After steadily accumulating these instruments during the intensification of the sovereign debt crisis up until May 2012, big banks shed massive amounts from their balance sheets. This was likely due primarily to the current interest rate environment, in which the profit outlook for this type of business is minimal, and to new regulations as part of the process of implementing Basel III in Europe.[22]

… and led to increased deposit-based financing

Moreover, big banks are observably soliciting deposits. Their portfolio of deposits has increased slightly since the pre-financial crisis period; following derivative financial instruments in the trading portfolio, deposits now represent the second most important type of debt. On balance, although big banks' funding is diversified to a similar extent as in the stage of financial market liberalisation and globalisation, the relative weights have shifted markedly. Capital market financing, in particular, is significantly less important than prior to the financial crisis and in the stage of financial market liberalisation in the 1990s. The high ratio of overnight debt (deposits and interbank debt) to total debt is also new (40% as against 26% in July 2007). There was, in particular, a shift from short maturities to overnight debt, which is why the percentage of the total of both types of liabilities, at 64%, is high but, by historical standards, not exceptionally so.[23]

Networked institutions

Networked institutions grew in the crisis

The business model pursued by the savings banks and cooperative banks is entirely different from that of big banks, which is heavily focused on the global market and investment banking activities. Both categories of banks be-

20 See Deutsche Bundesbank, September 2011, op cit.
21 See M Koetter (2013), op cit, p 20.
22 Basel III introduced capital requirements to cover the counterparty risks associated with over-the-counter (OTC) derivatives.
23 Although the share was just as high in the years 2005 to 2008, the percentage shares of the two components were reversed.

long to networks and, within these networks, generally function as the regionally focused credit institution which conducts mostly retail banking business. Its funding is therefore heavily dependent on deposits of households and enterprises (which make up around 70% of total assets). Just under 15% are acquired via the interbank market (mainly through the respective central institutions). The capital market, however, is hardly accessed directly by either category of banks. Both network systems have set out a clear-cut division of roles in this regard, with issuance being the prerogative of the central institutions (Landesbanken and cooperative central banks); these then provide the necessary financial resources to primary institutions as loans. The savings banks' aggregated total assets have grown 10% since 2007, whereas the credit cooperatives have expanded theirs by one-quarter over the same period.[24] Both banking categories achieved this growth through a strong expansion in their portfolios of deposits, which moreover replaced capital market funding, which had been scaled back to virtually zero. In addition, the savings banks reduced their interbank debt by 25% during the financial crisis (both to the Landesbanken and to the rest of the banking system), slashing mainly long maturities (-30%) which nonetheless still represent the greater part of their interbank debt. By contrast, the credit cooperatives increased their long-term interbank debt – the majority of which is to the central institutions – to the same extent as they did customer deposits (each by one-third).

High share of very short-term financing among networked institutions

The central significance of deposits as a source of funds for savings banks and credit cooperatives involves maturities on the liabilities side being shortened more extremely than is the case for other banking groups. Interest rates, which have fallen and have been low for quite some time across all investment horizons, have been encouraging customers to invest mainly in short-term, very liquid vehicles, provided they do not wish to invest in riskier vehicles. At present, some 90% of customer deposits at savings banks and credit cooperatives have an original maturity of up to one year. Shorter maturities for customer deposits and a growing share of deposits as a percentage of overall funding have caused the percentage share of all liabilities with an original maturity of up to one year to rise from just over 60% in July 2007 to now over 70% of overall liabilities of savings banks and credit cooperatives. This has also been observed, albeit to a somewhat limited extent, among regional banks, the majority of which – much like the savings banks and credit cooperatives – are oriented towards classic deposit and lending business. Since their funding structure is quite similar to that of the savings banks and, in addition, the composition of this category of banks may fluctuate sharply over time, they will be ignored below.

Regional institutions of credit cooperatives

Liquidity redistribution function within the collective still a key element for regional institutions of credit cooperatives, …

In their financial network, the two regional institutions of credit cooperatives occupy a central position in redistributing liquidity among affiliated credit institutions. This is not only because of the, on the whole, small size of the 1,047 credit cooperatives but also the strictly subsidiary organisational structure of the financial network, amongst other factors. Nearly half of funding is from the interbank market, though only just over one-third of these funds are taken up in the network – mostly short-term. The financial crisis has not changed this situation in any way. One-fifth is obtained via long-term capital market issuance, which, bucking the general trend, rose by one-third during the financial crisis. The credit cooperatives are the largest group of creditors, alongside domestic households. Unsecuritised debt to non-banks, by contrast, is immaterial. The

24 This comparison is based on the figures reported in the monthly balance sheet statistics; however, the savings banks' business volume is slightly understated since S-Kreditpartner does not have MFI status – it conducts only lending business, not deposit business. On the other hand, TeamBank AG, which performs a similar role for credit cooperatives, is included in the statistics because it fulfils the definition of an MFI.

main investors here are insurers and investment funds. Regional institutions hold next to no household deposits, since this is the role of the credit cooperatives.

Landesbanken

… but on the decline among Landesbanken

Although the Landesbanken, as the central institutions of the savings banks, have played a similar role to that of the regional institutions of credit cooperatives, the business model of several institutions in this category has, in the past few years, clearly become more similar to that of the big banks. The abolition of the state guarantees and guarantors' responsibility for ensuring their institutions' solvency, along with the conditionality imposed by the European Commission in the financial crisis, have led to a fundamental change in the funding structure of the Landesbanken. In the wake of the financial crisis, funding via foreign banks and the capital market was slashed. The aggregate total assets of the Landesbanken contracted by nearly one-third, and the number of institutions fell from 12 to nine.[25] All three main funding sources account for a more or less equal share of the current funding structure of the Landesbanken, which is attributable to their role in the savings bank network, amongst other factors. Notwithstanding the similarities between the Landesbanken and big banks with regard to business model, the Landesbanken are thus still making significantly greater use of securitised debt for funding than big banks. Although the Landesbanken, relative to the regional institutions of credit cooperatives, are less active than in the past in fulfilling their role in redistributing liquidity throughout the network, since many major savings banks are no longer dependent on such redistribution, they are discharging this function for the large number of smaller institutions, in particular.

Discussion of developments in the financial crisis

Diversifying the funding structure

Funding structure of banking categories can be divided into two "camps"

A look at the funding structure of the individual banking categories shows that the banks can be divided into two "camps": institutions which obtain funding largely from private non-banks (for savings banks and credit cooperatives, nearly three-quarters of total assets, and for regional banks, two-thirds of total assets), and institutions with more highly diversified funding. The latter group encompasses mainly the larger banks, though the weighting of the individual sources of funds can vary significantly depending on the bank's business model. Such business models range from regional institutions (regional institutions of credit cooperatives and Landesbanken) to major universal banks with extensive trading activity.

Diversified funding structure has fundamentally stabilising effect

Concentration on a single source of funding carries with it a fundamental hazard of exposure to a liquidity squeeze in crisis situations, whereas diversified funding structures, in principle, contribute to securing liquidity. However, owing to institution-specific factors, this rule is not readily applicable to all sources of funding. For instance, deposit guarantee schemes mitigate the risk of mass withdrawals of covered

25 This comprises both DekaBank Deutsche Girozentrale and Landesbank Berlin AG, which from around the end of 2014 or the beginning of 2015 began to focus almost exclusively on business with its Berliner Sparkasse brand owing to a reorientation of its business activities. None of the three institutions that fell by the wayside exited the market entirely. Whereas Landesbank Sachsen and Landesbank Rheinland-Pfalz were taken over by Landesbank Baden-Württemberg in 2008, Westdeutsche Landesbank was restructured. It was broken down into the state-owned Erste Abwicklungsanstalt (EAA) and Portigon AG, with only the former being liquidated. The erstwhile WestLB's network business was absorbed by Landesbank Hessen-Thüringen.

deposits[26] and thus render this source of funding comparatively stable even in crisis situations, and even if deposits are concentrated on a single group of customers and region. By contrast, short-term institutional deposits, which do not enjoy statutory protection, are generally withdrawn right away in the event of imminent distress or initial signs thereof.[27] Concentration on this type of funding therefore poses a greater liquidity risk than on customer deposits. Diversification across multiple creditors and regions will hardly mitigate the liquidity risk associated with short-term institutional deposits. Even in the case of capital market-based financing, such as via securitisations, impending disruptions can quickly lead to the respective market segment drying up, which would be tantamount to the elimination of this source of funding. However, a comparative assessment of financing structures based solely on the composition of the liabilities side is hardly possible since the structure of the assets side likewise presents opportunities for acquiring liquidity.

Incentives for secured funding

Trend towards secured funding …

The disadvantages of funding via short-term institutional deposits ("wholesale funding") became subject to intense public scrutiny during the financial crisis, as this was the first time that the attendant risks materialised on a large scale. Nevertheless, this form of funding continues to play an important role for banks, functioning as a buffer for short-term liquidity requirements. As the respective marginal cost of a bank's debt refinancing is determined by wholesale funding in conjunction with the costs of capital market funding, wholesale funding is also used internally for the purposes of loan pricing. Generally speaking, wholesale funding is what larger banks focus on for the purposes of financing and, in particular, liquidity management in order to ensure efficient operations. However, the financial crisis has not only highlighted the danger of basing a funding strategy primarily on short-term institutional deposits – it has also made investors more aware of counterparty credit risk, prompting them to hedge such risks and increase their demand for collateralised products. For example, since the start of the financial crisis, short-term interbank loans have no longer been granted on an unsecured basis, but chiefly on a secured basis as repo transactions. Uncovered debt securities are also increasingly being displaced by covered bonds. This trend towards secured funding, which began even before the crisis ensued, has been reinforced by the crisis and further boosted by recent regulation.

… is being boosted both by liquidity regulation …

The Liquidity Coverage Ratio (LCR),[28] which is being gradually phased in as of 2015, is very much influenced by the principle that short-term secured funding, particularly from institutional investors, is less frequently withdrawn than short-term unsecured funding and can also be more readily substituted by the borrower. That being said, the collateral is subject to certain liquidity requirements to ensure the underlying funding can be categorised as more stable.[29] Institutions with a large portion of short-term funding are therefore likely to make increased use of secured funding as a way of fulfilling the LCR. However, such institutions

26 Covered deposits are deposits protected by a European Economic Area (EEA) member state up to the amount of €100,000 per depositor. See Article 6 of Directive 2014/49/EU of the European Parliament and of the Council (2014).
27 See R Huang and L Ratnovski (2011), The dark side of wholesale funding, Journal of Financial Intermediation, Vol 20, pp 248-263.
28 The LCR is the ratio of the stock of highly liquid assets to the projected net cash outflows within 30 days in a severe liquidity stress scenario. The LCR is being phased in gradually from 1 October 2015 (minimum required LCR: 60%) until 2018 (minimum required LCR: 100%). See Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions.
29 For this purpose, the LCR defines the degree of liquidity that can be applied to the various assets. Secured funding transactions with the central bank are given special treatment in this regard. For example, if a bank that is subject to LCR requirements borrows from a central bank, such funding is regarded as the most stable type of funding, irrespective of the liquidity of the collateral provided. It is therefore assumed that this type of funding can always be renewed upon maturity at the same conditions. See also the box on pp 53-54.

Adjustment of German banks to the liquidity coverage ratio

Obligatory compliance with the liquidity coverage ratio (LCR) as of 1 October 2015 is not likely to require the majority of German banks to make any further adjustments. According to the report on the Basel III monitoring exercise for German institutions as of 30 June 2014,[1] all banks in the sample[2] already had an LCR above the 60% minimum requirement (capital shortfalls totalling €1.2 billion) at the end of June 2014, with the exception of one of the larger institutions (Group 1) and two smaller banks in Group 2. More than three-quarters of the banks in Group 2 already even have an LCR above 100%, while the remaining institutions will still need to raise a total of 0.7% more liquid assets by 2018. Four banks in Group 1 still have to boost their liquid assets by 6.7% compared to the current level until they fully meet the LCR.

Convergence towards the minimum requirement was primarily achieved by accumulating liquid securities holdings (above all government bonds), which account for approximately half of the eligible holdings of high-quality liquid assets for the German banking sector as a whole. Particularly in the euro-area aggregate, liquid securities (such as government bonds) are the most important components of high-quality liquid assets. For the larger banks (Group 1), the cash and central bank reserves component is, however, of equal importance.[3] According to studies by the European Banking Authority (EBA),[4] convergence of European banks towards the LCR requirements has, to date, not had a dampening effect on lending to small and medium-sized non-financial corporations. However, given the current generous provision of liquidity by the Eurosystem, a regime for liquidity regulation might not impose any binding restrictions on the majority of banks at the current juncture.

1 Deutsche Bundesbank, Ergebnisse des Basel III Monitoring für deutsche Institute, Stichtag 30. Juni 2014, March 2015.
2 The sample comprised 44 institutions on the reporting date, eight of which fell under the group of larger institutions (Group 1), which, as such, achieves a high coverage compared with the German banking system as a whole, while 36 fell under the group of smaller institutions (Group 2), which should be considered less representative. More detailed information is provided in the monitoring report (available in German only).
3 See European Banking Authority, CRD IV – CRR/Basel III monitoring exercise, Results based on data as of 30 June 2014, March 2015.
4 See European Banking Authority, Report on impact assessment for liquidity measures under Article 509(1) of the CRR, December 2013.

(above all, larger private banks) usually have large stocks of highly liquid assets, such as sovereign bonds with a 0% risk weighting. This provides them with an additional means of fulfilling the LCR, as these assets can be used to compensate for high outflows of short-term unsecured funding.[30] The adjustments made by German banks to date for the LCR are presented in the box above. The box on pages 50 and 51 explains the extent to which liquidity regulation could affect the structure of a bank's holdings of assets and liabilities.

… and bail-in rules

The incentive for secured funding has already been strengthened by regulatory changes and will potentially be further bolstered by another legal innovation that has applied in Germany since the start of 2015: the bail-in instrument.[31] This is because, as it is now possible to enforce creditor liability in the event of a bank being resolved, holders of unsecured claims must now anticipate a haircut even if no insolvency proceedings are carried out.[32] Creditors of secured liabilities, on the other hand, are excluded from the bail-in procedure and in the event of liquidation may, in a best-case scenario, be able to escape losses by selling the provided collateral. However, a high share of secured funding in a bank's balance sheet means that a large portion of assets are used as collateral and are therefore encumbered. For creditors of unsecured liabilities, this tends to

30 In fact, in an initial assessment of the possible effects of the liquidity measures on European banks, the European Banking Authority (EBA) finds that well diversified large cross-border banks have thus far used large volumes of particularly liquid assets (securities) to compensate for their high level of potential short-term cash outflows. See EBA (2013), Report on impact assessment for liquidity measures under Article 509(1) of the CRR.
31 For a more precise description of the new rules on the recovery and resolution of banks, see Deutsche Bundesbank, Europe's new recovery and resolution regime for credit institutions, Monthly Report, June 2014, pp 31-55. The bail-in instrument must be in force across Europe only as of 2016, but has already been implemented in Germany as of 2015.
32 The bail-in procedure is also subject to the provision that, following the application of the bail-in instrument, no creditor is left worse off than they would have been in the event of insolvency.

reduce the liable capital that can be drawn on in the event of liquidation. The introduction of the bail-in instrument could therefore bolster the trend towards secured funding by increasing investor demand. However, the effects of this depend in large part on whether the bail-in appears credible to market participants. In order to ensure that, in spite of such effects, there is sufficient liable capital in the event of a bail-in, institutions must fulfil minimum requirements in terms of their holdings of equity capital and bail-in-able liabilities. The issuance of unsecured bonds is therefore likely to become more expensive for banks in light of the higher loss given default that they entail.[33] Covered retail funding, as a source of unsecured funding excluded from the bail-in regime, could therefore become considerably more attractive still.[34] Moreover, deposits from natural persons and small and medium-sized enterprises that exceed the covered volume enjoy priority over the majority of other bail-in-able liabilities held by other categories of creditors.[35]

Significance of funding through deposits

Customer deposits classified as a very stable funding source in the LCR …

If increased funding through customer deposits leads to fiercer competition for these deposits, individual banks could find that such deposits become less stable if the average holding period (average time in which a deposit remains at the bank irrespective of the agreed maturity) decreases as a result of adjustments in customer behaviour. This effect is likely to be limited, however, as German households are generally fairly inactive in terms of reallocating assets. In comparison to other types of funding, regulators therefore continue to regard the deposits of private customers as a very stable source of funding alongside equity capital. In the LCR, this is reflected, above all, in the defined outflow rates for certain types of funding in a liquidity stress situation. For example, the outflow rate for short-term unsecured funding (residual term of up to 30 days) through financial corporations is assumed to be 100%, while the estimated outflow rate for deposits of private clients and small and medium-sized enterprises is likely to be a mere 10% in most cases.[36] Higher outflow rates are assumed in some cases, for instance for very large deposits. In terms of fulfilling the LCR requirements, this approach is likely to chiefly benefit savings banks and credit cooperatives. These institutions compensate for their relatively low holdings of easy-to-sell liquid assets through high levels of deposit holdings (which are often not subject to interest rate fixation periods or only subject to such periods over the short term).

… and in the NSFR

The Net Stable Funding Ratio (NSFR), which is still under discussion, provides similar incentives for short-term funding. Compliance with the NSFR is meant to make banks' funding more stable in order, amongst other things, to prevent liquidity bottlenecks that can arise as a result of the low liquidity of (long-term encumbered) assets.[37] The introduction to the Basel Committee's draft rules explicitly mentions the counterparty, alongside residual maturity, as an indicator of a funding type's stability.[38] Accordingly, deposits of private households as well as non-financial small and medium-sized enterprises are always considered to be more stable than liabilities vis-à-vis larger non-financial corporations, let alone liabilities vis-à-vis financial corporations. This assessment seems justified in light of past experience, which during the

33 The extent of this price effect also depends on the exact form taken by the aforementioned minimum requirements. The EBA is planning to recommend technical standards for these in July 2015. In addition, the standard for loss-absorbing capital currently being developed by the Financial Stability Board could also become relevant for global systemically important banks.
34 For more on the discussion on the share of the costs covered by deposit guarantee schemes, see Deutsche Bundesbank, June 2014, op cit, p 39.
35 See Deutsche Bundesbank, June 2014, op cit.
36 The assumed run-off rate for stable deposits is just 5% or, as of 2019, potentially just 3%.
37 The NSFR is the amount of an institution's available stable funding in relation to the stable funding required as a function of its assets. The draft NSFR of the Basel Banking Supervision Committee is currently in an evaluation phase. The ratio is to be introduced in 2018 at the earliest.
38 See Bank for International Settlements – Basel Banking Supervision Committee (October 2014), Basel III: The net stable funding ratio.

Internalising the costs of externalities by introducing new liquidity standards

In their function as service providers to the real economy, banks provide long-term loans to enterprises, which they finance with short-term liabilities. Thus, a key purpose of the banking system is to transform maturities. For performing this service, bank owners receive a premium, which, in effect, is their remuneration for creating liquidity. Given that interest rates normally climb the longer capital is tied up, there is an incentive for banks, from an earnings perspective, to keep the terms of their liabilities as short as possible and to maximise the maturities of their claims. However, if maturing debt is not rolled over, banks run the risk of no longer being able to meet their short-term obligations if their claims cannot be readily converted into cash at short notice (without incurring major losses) because they are tied up for the long term. As much as a bank can assume it will be bailed out by government in such a situation – and can therefore pass on some of the risks associated with this behaviour to society – it will incorporate ("internalise") only part of the potential systemic costs of its behaviour into its operational calculations.[1] Hence, from a macroeconomic perspective, that bank engages in an excessive degree of maturity transformation.

This is where the liquidity standards come in. Their objective is to more comprehensively internalise the potential systemic costs associated with maturity transformation, defining minimum requirements for a liquidity buffer which banks must hold for periods of stress as well as for the maturity structures of their assets and liabilities. In Europe, these minimum requirements will be regulated in future on the basis of harmonised and standardised liquidity standards such as the liquidity coverage ratio[2] (LCR) and the net stable funding ratio[3] (NSFR).

Liquidity is determined by the structure of both the assets side and the liabilities side of the balance sheet. The longer the maturity structure on the assets side and the less readily disposable its components are, and the more the liabilities side is biased towards short-term funding instruments that can easily be withdrawn by investors, the lower the bank's liquidity will be. The further a bank's existing assets-side and liabilities-side structures stray from the regulatory liquidity standards, the higher the costs it will need to internalise in the future.

The LCR requires banks to have a stock of unencumbered high-quality liquid assets (HQLA) that can be converted easily into cash to cover total expected net cash outflows in a 30-calendar-day liquidity stress scenario. The objective, then, is to ensure that every bank can survive a stress scenario marked by increased cash outflows and reduced cash inflows lasting roughly one month – if need be, by selling liquid assets from the liquidity reserve it is to maintain specifically for this purpose. The impact of the conditions for, and the volume of liquidity provided by the central bank on a bank's

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1 This also depends on the new recovery and resolution regime for credit institutions, and notably the bail-in tool, being applied credibly in future. See Deutsche Bundesbank, Europe's new recovery and resolution regime for credit institutions, Monthly Report, June 2014, pp 31-55.
2 Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions. To be phased in from 1 October 2015.
3 Basel Committee on Banking Supervision, Basel III: the net stable funding ratio, October 2014. Currently in the observation period, earliest implementation from 2018.

scope for building up this regulatory liquidity reserve should also be borne in mind (see the box on pages 53 and 54).

Under the LCR standard, run-off and inflow rates are influenced primarily by the type of counterparty and degree of collateralisation, with the assets and liabilities sides largely being treated symmetrically, especially in the case of short-term transactions with other financial agents. Short-term interbank loans collateralised by assets of similar liquidity, for instance, do not act to constrain intermediation chains within the banking sector given that rates of inflows from maturing loans and run-off rates from maturing funding are identical (both are high) in the 30-day window. These rates are lower for small and medium-sized enterprises because of the assumption that some of the inflows from maturing loans will be immediately lent out again. It is also considered very unlikely that their deposits will be withdrawn. Therefore, the banks that face the prospect of having to internalise more costs are primarily those with mismatches, in terms of their counterparties and the degree of collateralisation for short-term capital market transactions, between the assets side and the liabilities side of their balance sheets.[4]

Compliance with the NSFR, meanwhile, is particularly costly for institutions with huge mismatches between residual maturities on their assets side and liabilities side. Short-term liabilities are only recognised as required stable funding (RSF) for long-term assets (with residual maturities of one year or more) subject to capital deductions which vary according to their residual maturities and counterparties. A lower level of RSF is needed for assets maturing within one year. Hence, increased maturity transformation is one of the main reasons for a mismatch between RSF and available stable funding (ASF).

The comparison of liquidity characteristics on the assets and liabilities sides from the perspective of these standards means that an institution can generally adjust to meet the minimum liquidity provisions by contracting its balance sheet (scaling down long-term assets and short-term liabilities), by expanding its balance sheet (building up long-term liabilities and short-term assets), or by substituting balance sheet items (swapping long-term assets/short-term liabilities for items with the opposite maturity structures). If the bank's owners are not prepared to (fully) assume what might be a lower margin required for compliance with the liquidity standards – for example, by tolerating a lower dividend – the bank will try to pass on the costs that need to be internalised to creditors and borrowers. Whether and how far a bank will venture down these paths is likely to depend *inter alia* on whether it faces the prospect of losing market shares to competitors with lower costs to internalise, or on how much scope it has to save costs elsewhere in order to avoid putting an additional strain on its customers.

4 The central bank has a particular counterparty status. It is assumed, for example, that central bank loans can always be renewed at the same conditions upon maturity. See the box on pp 53-54.

financial and sovereign debt crisis has shown that large depositors and institutional lenders have reacted more quickly to changes in institution-specific and market-wide risks.

Increased maturity transformation

Heightened maturity-transformation risk for networked institutions

However, the advantages of funding through deposits (low volatility, no need for collateral and low costs) are coupled with poor control over the maturity structure, which is becoming particularly apparent in the current interest rate environment. As already stated, a clear shortening of maturities on the liabilities side has been observed, particularly for categories of banks that rely heavily on deposits as a source of funding. However, as the maturities for loans on the assets side have not shortened to the same degree over the last seven years, savings banks and credit cooperatives are subject more than most to an increased maturity transformation risk in their balance sheets. Beyond the liquidity risk effect, an increased interest rate risk also arises from the differences in the interest rate fixation periods, which have also widened, between the liabilities side and the assets side.[39] While the big banks are also subject to a relatively high maturity transformation risk, this risk has not risen sharply during the crisis. This is because although big banks have increased their recourse to funding through deposits, this represents a comparatively minor source of funding for them and they have not expanded their use of short-term institutional funding. By contrast, the regional institutions of credit cooperatives as well as the two categories of banks heavily affected by restructurings – Landesbanken and mortgage banks – have scaled back their short-term funding, though to differing extents. All other things being equal, this points to a lower liquidity risk from maturity transformation.

Regulation seeks to limit maturity transformation …

The experience of the financial crisis has shown that there is a strong correlation between the probability of an institution becoming distressed and it having a high level of maturity transformation and/or having a large proportion of short-term institutional funding in relation to overall funding. It is these risks that the various regulatory changes implemented in recent years, or currently at the planning stage, aim to influence. The objective is to constrain maturity transformation more strongly than in the past, while at the same time providing incentives for sustainable funding. However, an explanation is provided on pages 53 and 54 as to why the call for banks to maintain liquidity buffers in no way impinges on the central bank's role in the provision of liquidity. With regard to the fulfilment of the NSFR, liabilities with a residual maturity of more than one year are considered 100% stable. In a similar fashion to the arrangement under the LCR, the stability of short-term funding under the NSFR will probably be recognised in staggered percentages depending on the residual maturity and the respective counterparty. The available stable funding must be at least as high as the required stable funding calculated on the basis of the residual maturities of assets and the characteristics of borrowers. Assets with longer residual maturities need to be backed by higher levels of stable funding than those with shorter residual maturities. However, if an institution encumbers a short-term asset that is otherwise classed as liquid – for example by using a security as collateral for a longer-term refinancing operation – this reduces the liquidity of the assets side, which must be balanced accordingly through stable (long-term) funding.

… and to impose stricter capital requirements

Furthermore, the transposition of Basel III into European law in 2013 took account of the fact that a comfortable capital base and adequate capital buffer can significantly improve a bank's stability. The stricter requirements for banks' capital adequacy are a step in the right direc-

39 On aggregate, the increased revenue from maturity transformation has had a stabilising effect on interest income. See Deutsche Bundesbank, The performance of German credit institutions in 2013, Monthly Report, September 2014, pp 53-87.

Liquidity regulation and provision of liquidity by the central bank

The key objective of achieving liquidity regulation that is harmonised at the European level and internationally coordinated is to internalise the costs of macroeconomic external effects resulting from excessive maturity transformation by the banking system. The purpose of the liquidity coverage ratio (LCR) is to ensure that certain liquidity buffers are available at the single-entity level in the event of a stress phase. As a consequence, excessive maturity transformation, as witnessed in the run-up to the financial crisis for some institutions, entails additional costs, thus making a non-sustainable assumption of risk less attractive to banks. At the same time, the LCR is to reduce this risk by "making credit institutions less dependent on […] central bank liquidity provision" according to the recitals of the Regulation[1] (see first recital).[2] During the financial crisis, it became necessary for central banks to provide liquidity at favourable conditions and in generous amounts in order to help protect banks against a shortage of funds. The cost of external effects resulting from excessive maturity transformation, which was essentially taken on by the central bank through its extensive provision of liquidity, was not internalised by the banks to the specified extent.

The LCR-based buffer could, however, prove ineffective for several reasons. First, institutions may choose not to make use of their liquidity reserves during tense market phases. For reputational reasons, they would prefer to avoid falling below the liquidity coverage ratio despite being allowed to do so by the supervisory authorities. They could achieve this by, for example, selling long-term assets to increase their holdings of highly liquid assets – even if this can only be done at unfavourable conditions on account of being in a stress phase. Second, the protective LCR shield installed by the central bank may be flawed if some of the extra costs to be carried by the banks as a result of the regulation are essentially taken on by the central bank in advance. Although the liquidity regulation can determine which assets are deemed to be liquid for the purpose of fulfilling prudential ratios, the liquidity characteristic of an asset does not necessarily have to conform with this regulatory assessment at all times. This is mainly due to the fact that the central bank's ability to set the volume and conditions for creating central bank reserves largely determines which assets can ultimately be converted into central bank reserves and, therefore, also into cash at a given point in time.

It is not least due to this role of a central bank that the regulation stipulates that – unlike most other short-term liabilities – recourse to central bank loans must not entail any additional costs under the LCR, ie no highly liquid assets have to be held to cover such lending.[3] Hence, it is assumed for LCR purposes that central bank loans scheduled to be repaid within the next 30 days may constantly be renewed, regardless of the regulatory quality of the

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1 Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions. Gradual implementation from 1 October 2015.

2 Recital (3) is even more specific: "During such a [30-day stress] period, a credit institution should be able to convert quickly its liquid assets into cash without recourse to central bank liquidity or public funds, which may result in its liquidity coverage ratio falling temporarily below the 100% level."

3 All other things being equal, holding such buffers results in lower earnings. For detailed information, see the box on pp 50-51.

collateral held. This rule originates from the fact that central bank loans are, in principle, the most important standard refinancing operation in the Eurosystem. Furthermore, claims on the central bank are largely considered highly liquid assets as they represent a final means of payment, ie liquidity in the strict sense of the term. The LCR cannot be abstracted from the role of the central bank given that the refinancing of banks through the central bank is absolutely imperative due to cash outflows alone and cannot, therefore, be equated with refinancing via other sources. Since the central bank can determine the volume of central bank reserves and the conditions for creating these, it can, in principle, greatly extend the definition of liquidity formulated in the LCR as and when it wishes.

However, this opens a window for regulatory arbitrage on the part of institutions, especially in times when there is an abundance of monetary policy refinancing operations. Banks are then able to submit assets which are not or only to an extent recognised as being liquid for LCR purposes due to a lower level of liquidity in the market (ie level 2 A/B assets) to the central bank for refinancing and also deposit the funds received with the central bank. Subsequently, these assets are deemed highly liquid (level 1 assets) and are in principle fully recognised under the LCR.[4] Given the special role of the central bank in regulatory terms, the LCR can easily be exceeded, even in liquidity stress phases, through recourse to central bank loans. By means of its conditions – eg regarding the scope of the collateral framework, the level of haircuts and the refinancing costs – the central bank determines how easily banks can obtain central bank reserves and, by extension, assets deemed liquid by the regulators.[5]

However, in an environment where central bank loans are becoming more attractive compared with other sources of funding for a longer period of time, this bears the risk of the LCR not being able to work preventively and, therefore, losing its power as a protective shield against using the central bank as lender of last resort. This would mean that a share of the costs resulting from excessive liquidity and maturity transformations that need to be internalised would be shouldered by the central bank and, thus, ultimately, by the taxpayer. The LCR may fail to have a preventive effect as it does not necessarily reflect institutions' resilience to liquidity shortages in the market and is, instead, largely shaped by the behaviour of the central bank. It will be all the more important for institutions to define the necessity and scope of further individual liquidity reserves beyond the minimum requirements prescribed by the LCR. Together with the central bank, regulators are called upon to monitor this process in a farsighted manner with a view to reducing the probability of future liquidity risks and promoting the broadest possible internalisation of costs arising from increased liquidity and maturity transformations by the proprietors of banks.

4 The treatment of minimum reserves in this context is based on agreements between the supervisory authority and the central bank (see Article 10 (1b) point (iii) of Commission Delegated Regulation (EU) 2015/61.
5 When pursuing an expansionary monetary policy strategy, of which the main monetary policy instrument is bond purchases, recourse to central bank operations improves an institution's LCR only if bonds are purchased that, unlike central bank reserves, are not regarded as highly liquid for LCR purposes.

tion. Nevertheless, banks' resilience is not something that can be created through regulatory provisions alone. Indeed, it depends, amongst other things, on the extent to which banks can generate equity capital internally on a sustainable basis; ie the extent to which they have a tenable business model.

Earnings structure of German banks

Impact of the financial crisis

Networked institutions stabilise income through increased maturity transformation

The business models of German banks have been put to the test by the financial crisis. Credit institutions that focus primarily on deposit-financed lending have thus far gone almost entirely unscathed. These include the majority of savings banks and credit cooperatives, as well as numerous regional banks, which have therefore scarcely needed to change their business activities at all in recent years.[40] However, due to their strong dependence on interest income from the traditional lending business, the current low-interest-rate environment presents a great challenge for these banks. By expanding the volume of their lending and deposit business and increasing maturity transformation, the institutions in question are attempting to sidestep the downward pressure on profitability caused by the current interest rate environment. Therefore, the profitability of savings banks and credit cooperatives, which has hardly changed on aggregate, has been maintained largely at the expense of higher interest rate risks. Stable profitability is of major importance for these categories of banks, as they are almost exclusively dependent on profit retention for building up equity capital. If the extreme low-interest-rate environment persists, this could require adjustments to be made at the relevant institutions. This could also include shareholders having to shoulder a greater burden.

By contrast, as described in the previous sections, business models that do not focus primarily on the traditional lending and deposit business have been hit hard by the crisis. From the 1990s to 2007, a clear expansion of financial market exposure and interbank transactions was observable among larger German banks on both the assets and the liabilities side, particularly among the big banks and Landesbanken. The expansion into the field of investment banking went hand in hand with a greater diversification of income sources, with income from trading and commission becoming significantly more important, alongside interest income, in relation to total assets. However, this expansion was also accompanied by higher income volatility. By contrast, the expansion in interbank market activity entailed a less volatile business area, yet one with relatively low margins (see the chart on page 56).

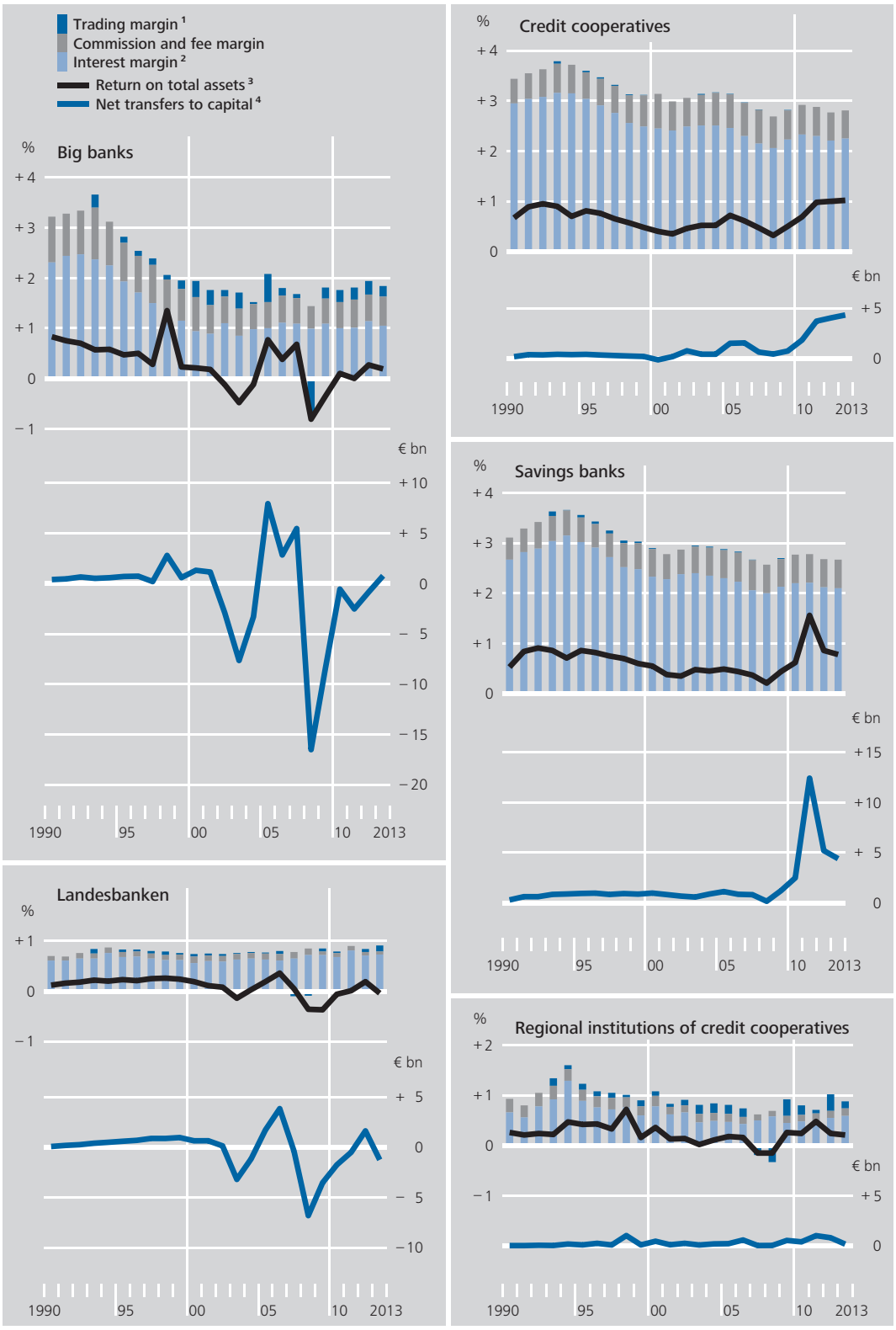
Investment banking increases profit volatility, …

Although, on aggregate, the business volumes of both areas grew strongly, the individual banks did not expand uniformly in each field. Some of the big banks placed their strategic focus on investment banking, while the remaining large institutions among the various categories of banks were either relatively strong in the retail business or expanded vigorously on the interbank market by virtue of their role as a regional institution of a networked banking group. The large share of relatively low-margin interbank business in relation to their total business volume is the reason why the regional institutions of credit cooperatives and the Landesbanken have historically had rather low returns and profits compared to other larger institutions (see the chart on page 56).[41] By contrast, up until the financial crisis, the big banks had a superior profitability ratio to most other larger German banks, particularly compared to Landesbanken that pursued a similar business model. The greater size of their trad-

… but provides higher earning opportunities than interbank business

40 As there are certainly heterogeneous developments among the savings banks too, this statement cannot be automatically applied to every institution. However, it applies to the majority of the institutions and thus to this category of banks in aggregate.
41 Here, the interest margin is used as a measure of return, while return on total assets is used as the measure of profitability.

Income structure of selected categories of banks*



***** Data based on annual accounts pursuant to the German Commercial Code (HGB). Margins calculated from the operating income of the respective income stream in relation to total assets. Total assets excluding derivatives in the trading portfolio. **1** Net profit or loss on financial operations only recorded since 1993. **2** Interest received includes interest income from traditional lending business as well as interest income from money market transactions and from debt securities and debt register claims. The cost of equity is not included under interest expenditure. **3** Pre-tax profit for the financial year as a percentage of total assets. **4** Including the fund for general banking risks and excluding participation rights capital.

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ing portfolio in relation to their overall business volume is likely to have contributed to this. However, the higher profits and more diversified income structure go hand in hand with the trading business's higher earnings volatility, which in turn implies increased vulnerability to crises. Thus, during the financial crisis, poor profitability was largely attributable to losses in the trading business.

Consequences of low earnings

Low earnings reduce capacity to generate capital internally

When viewed in isolation, persistently low earnings do not initially represent increased solvency risk. However, they restrict a bank's capacity to generate capital internally that can be used to offset losses. Credit institutions with weak earnings are significantly more dependent than comparable better-performing banks on their shareholders' willingness to implement capital increases to cover any losses. The problem of high risk propensity combined with only limited potential to generate capital – on account of weak earnings, for instance – was revealed during the financial crisis, particularly at a number of institutions in the big banks and Landesbanken sectors, which would have had to be liquidated if not for government support measures.[42] In principle, such support measures run counter to a market economy system, especially if they lend credence to the impression that government assistance will be granted more or less automatically in a crisis situation. The rules resolved upon under the German Act Implementing the Bank Recovery and Resolution Directive (BRRD) *(BRRD-Umsetzungsgesetz)*, and notably the bail-in instrument discussed above, aim *inter alia* to facilitate the resolution of institutions in which going-concern risk gives rise to systemic risk and to avoid the socialisation of costs during a crisis, if possible. [43]

Landesbanken

As a result of experiences in the financial crisis, but also due to more restrictive banking regulation (Basel III), the four largest Landesbanken analysed in this article have improved their loss-absorbing capacity (see the chart on page 58). For example, as against 2006 they have deleveraged and reduced the risk contained in their balance sheets, and as a result of this in particular, they have increased their regulatory tier 1 capital ratio. In the aggregate, the above-average balance sheet reductions made by the Landesbanken since the onset of the financial crisis compared with the other German categories of banks are likely to also be closely linked to the poor profit situation.[44] Since the shareholders of the Landesbanken, primarily the public savings banks (associations), were slow to provide additional capital, but at the same time internal capital generation was difficult owing to a lack of profits, the only remaining means by which the Landesbanken themselves could meet the capital requirements was (regulatory) balance sheet reduction.

Landesbanken increasing their tier 1 capital ratios by reducing risk content of their assets

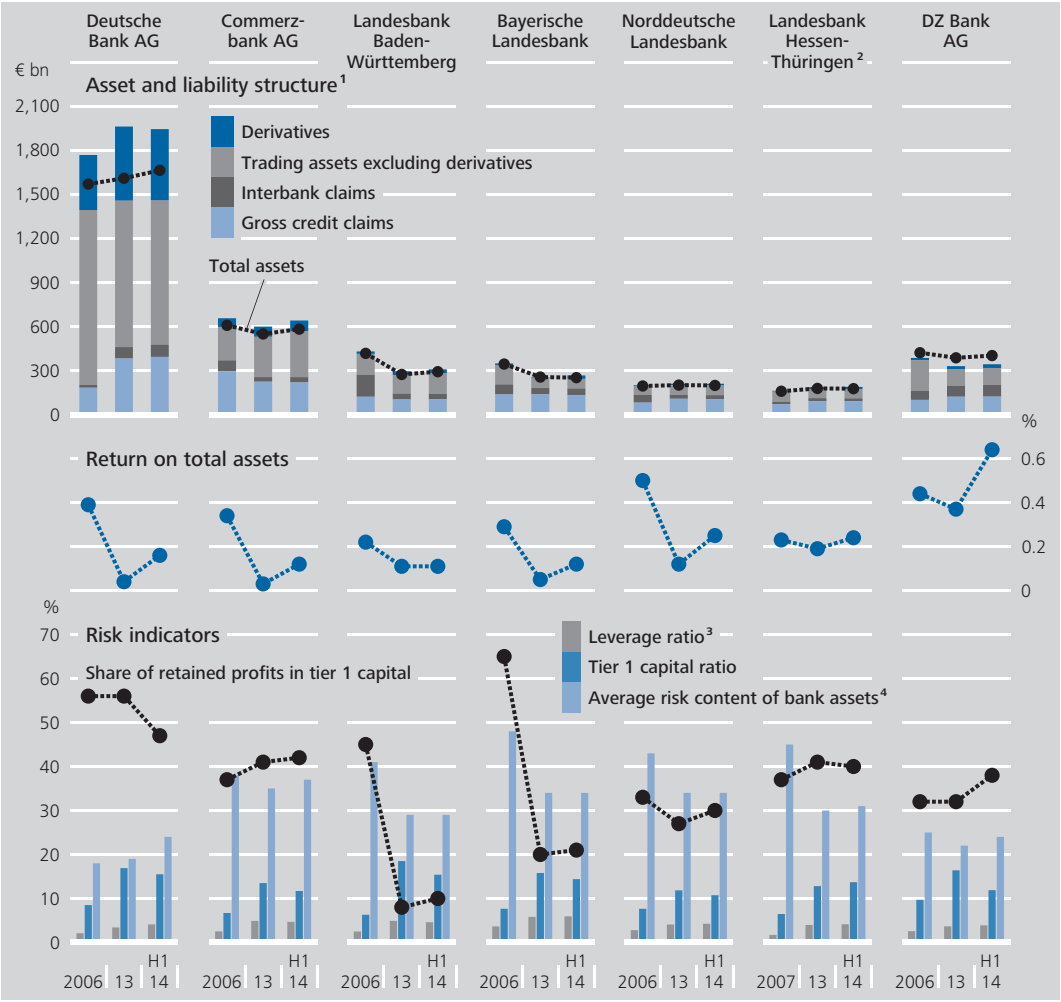
Regional institutions of credit cooperatives

Regional institutions of credit cooperatives managed to generate capital during the crisis

Another development was evident among the regional institutions of credit cooperatives, however, which allowed their business model to focus more strongly than the Landesbanken on their liquidity redistributing function within the collective. Although the biggest regional institutions of credit cooperatives also had to shoulder considerable losses during the financial crisis, the additional capital requirements

42 The following institutions had to draw on government support (SoFFin) in Germany: Aareal Bank AG, Bayerische Landesbank, Commerzbank AG, CorealCredit Bank AG, Düsseldorfer Hypothekenbank AG, Hypo Real Estate, HSH Nordbank AG, IKB Deutsche Industriebank AG, Sicherungseinrichtungsgesellschaft deutscher Banken mbH, Westdeutsche Landesbank. Between 2008 and 2013, the German government granted the financial sector assistance in the amount of around €144 billion (this assistance comprises recapitalisations and relief measures for assets). See Financial Market Stabilisation Agency, Overview of SoFFin measures, Status: 31 December 2014; and European Commission, DG Competition, State Aid Scoreboard 2014 – Aid in the context of the financial and economic crisis.
43 See Deutsche Bundesbank, June 2014, op cit.
44 In addition to this, the Landesbanken banking category was hit heavily by restructuring conditions imposed under the EU state aid procedure, which also influenced the decline in total assets in the aggregate.

Business structure of larger German banking groups*



Source: Bankscope and Bundesbank calculations. * Data based on IFRS financial statements. **1** Key balance sheet items are shown. Credit claims shown in gross terms, ie excluding provisions in lending business. **2** Data on tier 1 capital and risk-weighted assets not available for 2006. **3** Leverage ratio calculated as the ratio of reported capital to total assets. **4** Average risk content calculated as the ratio of risk-weighted assets to total assets.

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that arose as a result of this were covered by the owners – the credit cooperatives. Unlike the Landesbanken, therefore, no balance sheet reduction was seen at the regional institutions of credit cooperatives in the past few years, since the injection of capital meant that toxic assets could be quickly cleaned up.

Big banks

Big banks so far able to cover additional capital needs primarily on the market, …

The big banks – some of which are significantly more active in investment banking than the Landesbanken and regional institutions of credit cooperatives – also had to realise considerable losses in the financial crisis. On aggregate, this prevented this category of bank from building up its capital by retaining profits between 2007 and 2013, which is probably why the big banks pursued the aim of covering their capital needs on the market. However, government recapitalisation could not be avoided in one case.[45] In contrast to the development at the Landesbanken, the average risk content of the assets held by the two parent undertakings domiciled in Germany did not decline during the financial crisis (see the chart above). However, the heavy increase in capital, particularly from external inflows of funds, overcompen-

45 See Financial Market Stabilisation Agency, op cit.

sated for this development and consequently led to a clear increase in their tier 1 capital ratio and a reduction in their leverage.

Dealing with weak earnings

… but probably cannot avoid developing strategies to stabilise their earnings

Not only the negative repercussions of the financial and sovereign debt crisis on financial market activity, especially with regard to riskier bank products (eg subordinated bonds and structured products), but also the push towards separating certain lines of business from the core bank (eg proprietary trading) are likely to make considerable changes necessary to the business models of the big banks in particular.[46] In addition, the persistently weak earnings in the big banks sector since 2007 will probably bring about more far-reaching structural changes, enabling them to remain attractive to investors on the one hand and not be too heavily dependent on external capital sources by generating capital internally on the other. There is already a trend towards renewed activity in their traditional lending business, for instance. In this context, the target group of the big banks, just like the rest of the larger German banks regardless of the category of bank in which they are included, is likely to be major non-financial corporations. The fiercer competition for a customer segment for which financing via bank loans is significantly less important than for smaller enterprises is likely to restrict earnings potential in this business segment, however. An upturn in the capital market would be advantageous from an earnings perspective for the big banks in particular, as their business models are actually geared towards capital market activities. In this setting, the European Commission's plans to create a capital markets union – and notably to harmonise the legal requirements for securitising claims on small and medium-sized enterprises – are likely to open up positive prospects for these banks.

In principle, there are two conceivable options for tackling operationally weak earnings and thus implicit capital restrictions: concentrating on specific business areas that are higher-earning but simultaneously tie up less capital while total assets remain more or less unchanged, or significantly shrinking the bank balance sheet.[47] Traditional lending business, for example, potentially offers good earnings opportunities, but unlike financial market transactions it tends to be more capital-intensive from a regulatory perspective.[48] Furthermore, the still relatively high-margin traditional banking business is already occupied in Germany by a number of categories of banks, especially in the areas of small and medium-sized enterprises and households. Banks' expansion opportunities in business with major non-financial corporations are also limited owing to their funding structure (high significance of internal market funding and capital market funding, amongst other factors). Taken by itself, competition in this field, which is probably growing nonetheless, is likely to involve a narrowing of the interest margin for most of the categories of German banks.

Scarcity of capital at banks entails economic problems

Need for efficient competition in the German banking system

An institution's prospective survival vitally depends on it having a sustainable business model, which means, in other words, that it can access sufficient income sources in the future, too. In this regard, it is not the task of supervisors to stipulate specific business models, but rather to promote competition in the banking system that boosts efficiency and to ensure that credit institutions with structurally weak earnings which are experiencing real

46 The universal banking principle in Germany is not being called into question by the current regulatory initiatives. For an overview of structural changes at big banks in an international comparison, see PwC, Structural reform study: Supplementary report 2, November 2014.
47 While temporarily weak earnings can also be tackled by reducing fixed costs, structurally weak earnings are only likely to be remedied in the long term by sustainably increasing operating income.
48 The main portion of the interest margin – by far the most important operating income across all categories of banks – is generated through traditional deposit and lending business in the German banking system. The average has been roughly 90% since 2003. Source: Deutsche Bundesbank (German contribution to the harmonised MFI interest rate statistics of the euro area as well as the profit and loss statistics of German banks).

solvency problems exit the market significantly faster than was previously the case, regardless of their size.

Conclusion

This article made the conceptual distinction between specific categories of business models along three dimensions, specifically the legal form of banks, their asset and liability structure – the latter focusing on their funding structure – and their earnings position. Although there has been considerable consolidation in the German banking system in recent decades, this occurred mostly within the individual pillars. This means that the ownership structure has barely changed in the aggregate. By contrast, the funding mix has been subject to significant change since the financial crisis, although essential characteristics of the individual categories of banks have been retained. Larger banks, for instance, increasingly returned to traditional banking business, with a business model geared towards the money market and capital market. This is likely to be a result of restrained capital market activity primarily in the area of bank products (eg bank debt instruments, derivative instruments, securitisations) and weak earnings, but also of the new regulatory requirements stemming from the experience gained during the crisis. As long as the first two factors, in particular, continue to exist, it can be assumed that larger banks will probably step up their involvement in traditional lending and deposit business in the future, too.

Weak earnings imply difficulties in generating capital internally. If banks that are *de facto* insolvent are then not permitted to exit the market, this can trigger negative repercussions for the economy and monetary policy. One of the objectives of the new banking regulation is to facilitate the resolution of banks without government assistance. The aim is to reduce both the probability and necessity of government intervention by introducing more stringent requirements for banks' loss-absorbing capacity. Furthermore, when regulators and supervisors assess the viability of a bank, they will place greater emphasis than before on its ability to generate capital internally. Only banks with a sustainable business model can thoroughly fulfil their financing function in the economy over the long term. All of the reforms to banking regulation that are currently being initiated serve the purpose of making the financial system more stable, and should therefore be supported as a step in the right direction, not just from a monetary policy perspective. The significantly stricter regulatory requirements in a sub-sector of the financial system, specifically the banking sector, increase the incentives for regulatory arbitrage, however. The reform of banking regulation therefore has to be promptly supplemented with corresponding measures in the other sectors.