

Financial market stability in times of unconventional monetary policy

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AT A GLANCE

Asset price development in individual eurozone countries as a result of the ECB's expansionary monetary policy requires increased vigilance on the part of macroprudential regulators.

Despite the monetary measures, credit growth to households and companies in the euro area remains restrained, so that macroprudential regulation does not yet have to take a restrictive approach.

German banks are currently not responding to the low interest environment by taking greater risk. The financial market supervisory and regulatory authorities in Germany should turn their attention more than previously towards the shadow banks (money market funds, investment funds, insurance companies and pension funds). This sector is showing first signs of increased risk taking which is feeding back into asset prices.

THE CONSTANTLY ENDANGERED STABILITY OF FINANCIAL MARKETS

The financial market crisis showed that undesirable developments in the financial markets will sooner or later affect the real economy. Due to the close linkage of global financial markets and the high speed of information transfer, fast-spreading economic slumps may ensue on a global scale. The risk of such instability had already manifested itself at the beginning of the millennium when the dotcom bubble burst, followed by a global recession – albeit a significantly weaker one than during the 2007/2008 financial crisis.

Viewed against this background, it is important to be vigilant with regard to the stability of financial markets. Signs of distortion should be a cause for immediate countermeasures which would help to prevent economic slumps from the outset. The difficulty is that due to the uncertainty inherent in the financial markets such an analysis should include a system of indicators that would flag up these undesirable developments reliably at an early stage. Until now this has proved to be possible only to a limited extent. Analysis of the stability of these markets also serves to obtain knowledge regarding reliable early-warning systems. This is made more difficult by limited empirical experience. Further challenges with regard to assessing financial market stability result from the unconventional monetary policies being pursued in many economies, including the euro area, with interest rates close to zero and a dramatic expansion of liquidity supply.

THE ECB'S UNCONVENTIONAL MEASURES

In January 2015, with interest rates already close to 0 %, the European Central Bank (ECB), announced further unconventional monetary policy measures in response to the continued failure of the inflation rate to reach its target level

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and to falling inflation expectations. In March, the existing securities-purchase programmes (covered bonds and secured loans) were expanded to include securities issued by public bodies and the monthly purchase volume was raised to 60 bn euros, including 80 % government bonds and bonds issued by European institutions and (semi-) public companies. The purchasing programme is currently planned to last until September 2016. If necessary, the programme is to continue “until a sustained adjustment of the inflation path” towards the inflation target is assured (ECB, 2015). In addition, the ECB is conducting long-term refinancing transactions with the banks. The main refinancing rate has reached 0.05 %, and with that probably its lowest level, while interest on the overnight deposit facility has even moved into negative territory. Since September 2014 the rate has been -0.2 %. Commercial banks therefore have to pay rather than receive interest on their reserves in the Eurosystem.

By expanding the scope of its monetary policy, the ECB is pursuing its primary goal of price level stability and, with this in mind, is stimulating economic growth in the euro area. There are three possible channels of transmission: first, the confidence effect. This is based on stabilising the market participants' expectations by announcing and implementing radical measures, so that they come to judge economic development more positively. As a result, inflation expectations are more closely aligned with the central bank's

inflation target, which should cause the currently too low inflation rate to rise in the direction of the ECB target. Second, the portfolio effect, and the closely related risk appetite effect, which manifests itself due to lower interest rates in increased lending and investment. Third, the exchange rate effect by which export-led growth is promoted by the devaluation of the euro.

However, a strategy of this kind also contains risks with regard to financial market stability. The sharp fall in long-term interest rates in accordance with the desired portfolio effect, for example, leads to greater demand for investments with higher returns (Bundesbank 2015a, 2015b). This leads to rising asset prices on the one hand and to increased and potentially risky lending on the other. If these risks are realised, the resulting panic may cause new turmoil in the financial markets, with serious consequences for the real economy.

This begs the question of whether the measures taken thus far have already had effects on the real economy that go beyond what was desired and indicate the development of an unsustainable bubble. Such an analysis has to take into account the short period since the introduction of quantitative easing (QE) and is affected by the publication date due to the high data frequency. The data status for this analysis is mid-July 2015 against the background of an expected period of QE running until September 2016. The analysis can also be regarded as partial to the extent that other factors outside the channels examined may also have a notable influence on asset prices and lending. For example, the rise in share prices in Germany was interrupted in the summer of 2015 by uncertainty concerning the negotiations of the third rescue package for Greece on the one hand and economic developments in China on the other. Neither was the result of monetary policy measures.

Further side-effects of unconventional monetary measures may also ensue in relation to income distribution (Bernoth et al. 2015, Claeys et al. 2015)¹ and to interest rate risk for financial

institutions (Claeys and Darvas 2015). While the effects on income distribution such as changes in the Gini coefficient cannot be measured for the euro area at the present time, it is possible to state under which conditions particular attention should be paid to potential interest rate risks. In particular, it is necessary to consider whether such measures should be taken in advance as a preemptive step long before the intimated end of unconventional monetary policy in autumn 2016.

The following analysis concerns the risks to financial market stability, focusing on the euro area and Germany. Here, the unconventional monetary policy measures constitute a possible source of risk for financial market stability. However, these measures are also to be judged against the background of their intended effects on inflation and growth.

EFFECTS OF UNCONVENTIONAL MONETARY POLICY

Macroeconomic effects to date

The primary objective of the ECB's unconventional monetary measures is to avoid the damaging effects on the real economy of inflation remaining at a level below the inflation target for a sustained period (Horn et al. 2015)². If long-term nominal interest rates fall due to market intervention by the central bank, this will have a dampening effect on real interest rates without initially changing the inflation rate. The faster the inflation rate subsequently rises, the stronger the intended effect of the measures on the real economy will be. The long-term interest rates in many euro area countries, however, rose slightly from April, one month after the operative beginning of QE. Short-term interest rates, as seen in the three-month Euribor rate, on the other hand, continued to fall slightly till July. On the basis of the confidence effect, it could be argued that the recent rise in long-term interest rates suggests a stronger alignment of inflation expectations with the inflation target.

This could be countered by pointing out that the long-term interest rates were still at a comparatively low level (IMF 2015a). For example, the yield on ten-year German bunds of 0.7 % in July 2015 is virtually the same as in November 2014. On the other hand, inflation has only risen slightly. The HICP annual inflation rate excluding energy, food, alcohol and tobacco measured in July 2015 was 1.1 %. In March the rate had been 0.7 %. Thus the rise in long-term interest rates is preventing a significant drop in long-term real interest rates, with only a slight rise in inflation so far.

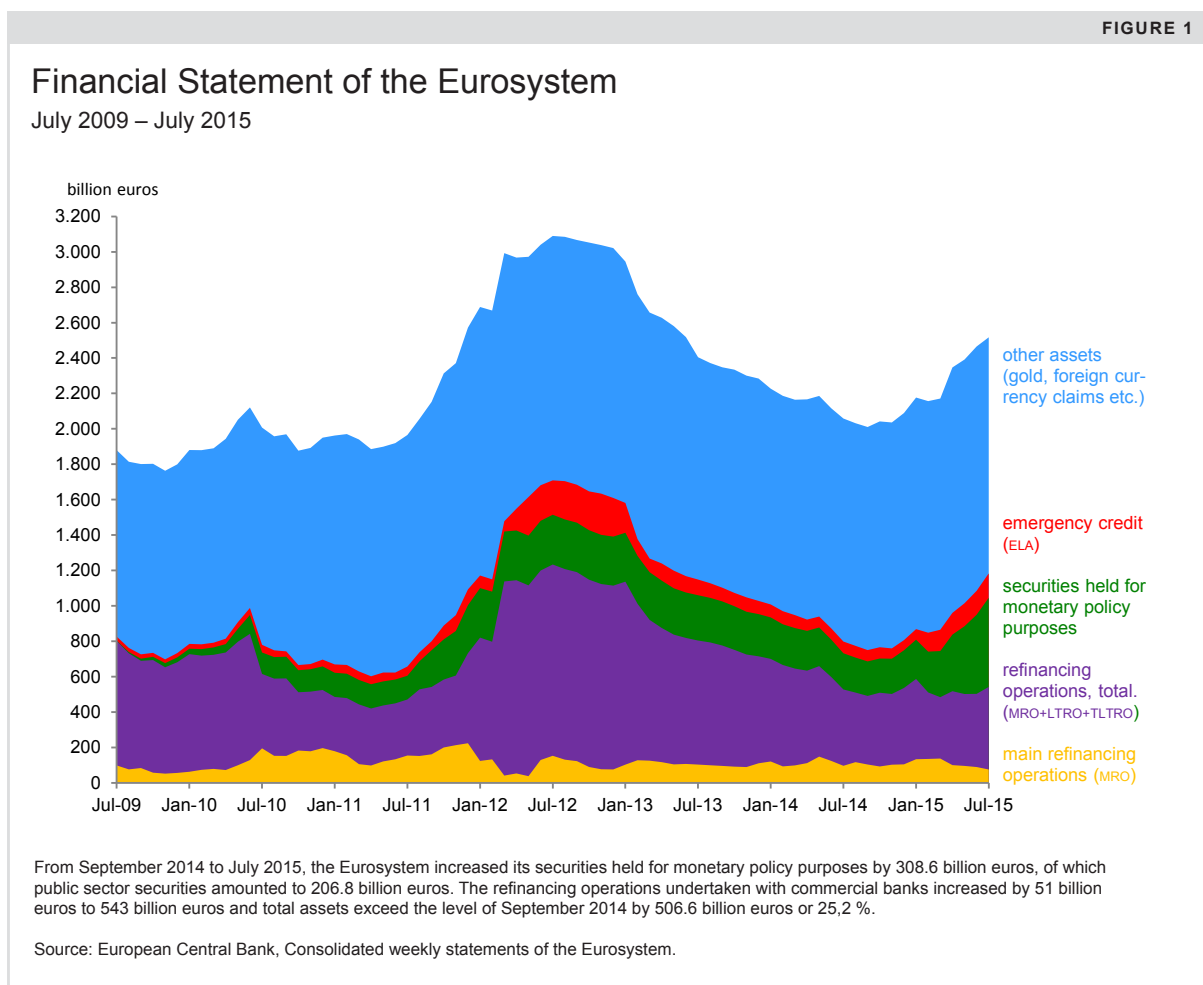
In order to estimate the efficacy of the portfolio effect, it is necessary to consider additional factors along the monetary policy transmission channel to the real economy. Until now, the ECB has been able to purchase the planned volume of securities. Furthermore there are no signs so far that the additional liquidity that is being injected into the banks through the purchase programmes has led to a decline in regular refinancing activities (main refinancing operations, three-month tenders, longer-term refinancing) (Figure 1; Bundesbank 2015b). There has been a corresponding rise in excess liquidity, i.e. the highly liquid deposits of commercial banks on their accounts with the central bank in excess of their minimum reserve targets. This alone does not guarantee the desired portfolio effect, however, as government bonds are simply being exchanged for central bank deposits on the asset side of the banks' balance sheets.

For an efficient portfolio effect, the composition of the balance sheets in the banking sector will have to change in such a way that government bonds are (imperfectly) substituted by riskier loans to the private sector. Borio and Disyatat (2009) describe the possible mechanism of such influence on private balance sheets through QE: as a result of the central bank purchasing government bonds and thus increasing the demand for them, not only their yield but also the average yield on the asset side of the banks' balance sheets falls³. Assuming that the banks

try to achieve similarly high returns with the same balance sheet total, they will not replace the government bonds with lower-yielding central bank deposits, but with riskier loans. Borio and Disyatat (2009) emphasise that at the same time the measure will become less effective once the market participants become accustomed to the purchases by the central bank. In this case, the banks will adjust their balance sheets to the changed market environment: by reducing either their balance sheets or the expected average return on assets.

Joyce et al. (2011) concentrate on the influence of the portfolio effect on interest rates and identify a decline in interest rates of one percentage point for medium and long-term government bonds in the UK. Kapetanios et al. (2012) come to a similar finding also for the UK in the form of noticeably positive effects on growth and inflation. The Bundesbank (2015a, p. 56) argues that there is 'clear evidence of the existence of a risk appetite channel in monetary policy', which is defined by 'banks (being) willing to take higher risks without this being compensated for by a rise in risk premium'. Accordingly, QE by the Federal Reserve (Fed) was followed by an increase in new lending by some US banks. The evidence from the UK and the USA cannot easily be transferred to the present situation in the euro area, as the long-term interest rates in the Anglo-Saxon countries prior to QE were significantly higher than in the euro area. In addition to the greater sensitivity of real interest rates in this situation, it may also have been easier to find securities with higher returns at that time.

The Bundesbank (2015b) also documents a rise in the money supply (M3) for the euro area of which only a small part can be interpreted as the result of loans to the private sector. By far the greatest part is accounted for by changed preferences for more liquid funds due to lower interest rates. This results in longer-term liabilities, such as time deposits, being converted into cashable forms, such as sight deposits. Recently there has also been some evidence of an easing



of lending standards and an upturn in lending growth rates. However, rising lending growth for Italian and Spanish households simply means falling net repayments. In addition, the July increase in book loans to the private sector of 1.1 % year on year in the euro area as a whole is only slightly above the expansion threshold (Figure 8, top right). It therefore remains to be seen whether the unconventional monetary measures will contribute to an appreciable portfolio effect and thus to economic recovery in the euro area.

What is clear is the exchange rate effect. Since the beginning of the year the euro has devalued by 10.8 % against the US dollar⁴, which can be accounted for to a considerable extent by (international) investors switching from euro-denominated portfolio holdings with low or negative yields to assets denominated in other

currencies. The IMF (2015a) estimates that portfolio outflows for the year 2015 account for up to 2 % (1.2bn euros) of all financial assets⁵. These shifts will be reinforced to some extent as soon as the US Federal Reserve ushers in higher interest rates. Despite the effect on the exchange rate, the short-term consequences of portfolio outflows for the financial stability of the euro area will be limited, however.

A weaker euro supports exports and thus growth. In addition, more expensive imports lead to higher inflation, as desired. On the other hand, the exchange rate channel is encouraging further fragmentation within the euro area because countries like France, Italy and Spain do not share Germany's degree of openness. To this extent, Germany is profiting most from devaluation, although it least needs to. As a result,

other member states cannot catch up. This will probably lead to a deepening of the foreign trade imbalances within the euro area and, due to the already high balance-of-payments surplus of the euro area, it also contains the risk of increasing financial fragility and macroeconomic instability at global level.

The relation between monetary policy and financial market stability

The massive slump in GDP following the financial market crisis of 2007/2008 led to central bank policies being reconsidered. This refers not only to the recourse to unconventional monetary policy, but also to the widening of central bank authority to include responsibility for financial market stability. In the meantime, resources for macroprudential policy (regulation) have been intensified and financial stability established as an explicit goal of central bank policy. In this context, it has frequently been stated, for example by the Bundesbank (2015a), that the traditional view, according to which monetary policy should only respond to asset price developments to the extent that they affect inflation expectations and thus ultimately price stability as measured by consumer prices (Bernanke and Gertler 1999), is outdated. However, Bernanke and Gertler only point out that interest rate policy is not an efficient tool for combating excesses in asset prices. This does not rule out instruments of macroprudential policy⁶ then being used restrictively if there is sound evidence of an excessive and unsustainable development in the financial cycle⁷.

Borio and White (2004) are often cited as an example of foresight with regard to imbalances in the financial cycle. The authors describe the interplay of strong credit and asset price growth, while inflation rates remain at a comparatively low level although GDP growth is relatively strong. The authors were vindicated by the financial market crisis in that the huge expansion in mortgage lending and the rise in property prices in the USA prior to the crisis went on for a long time without

any sign of inflation and a corresponding interest rate response by the central bank. Although Borio and White (2004, p. 27) do not rule out monetary policy 'leaning against the wind, [which] might also reduce the amplitude of the financial cycle', the main part of their analysis concerns the role of monetary policy in its interaction with an increasing liberalisation of the financial markets. This interaction suggests, however, that the more important measures for financial market stability are those in the area of improved micro- and macroprudential regulation.

What is less clear is the role of expansionary monetary policy which includes the ECB's QE measures. In the empirical literature, the assessment of the contribution of expansionary monetary policy to the creation of financial market instability varies. The econometric approach taken by Bordo and Landon-Lane (2013) seems to confirm the hypothesis put forward by Taylor (2010) that measured against the deviations from the standard Taylor rule, the Fed's monetary policy was too loose and thus to a great extent caused the house price boom that continued in the USA till 2006. Joebges et al. (2015), on the other hand, only identify a monetary policy contribution to the house price bubble if there is parallel liberalisation of the financial markets and if the real three-month interbank interest rates are used as an indicator (measured against their deviation from the long-term average). Similarly, despite different estimation methods, Blot et al. (2015) cannot prove any time-stable relationship between price stability and financial market stability and conclude that this casts doubt upon the suitability of monetary policy with regard to leaning against imbalances in the financial cycle.

Study of the literature provides at least three reasons that speak against the orientation of monetary policy (in a narrow sense) towards financial stability: first, such an orientation would be extremely costly if restrictive monetary policy curbed economic growth too soon. Curbing growth may be justifiable in that the production losses that follow financial market crises are

avoided. Even macroprudential policy may miss the optimum moment for avoiding a crisis; due to more pinpointed orientation, however, the associated costs will tend to be lower than those resulting from the use of interest rate policy. If one considers credit growth in the euro area, for example, a tightening of monetary policy would cause significant damage. The deleveraging process in the private sectors of several euro-zone countries is particularly painful because it is mainly based on net repayment rather than high growth and inflation (Hüttl and Wolff, 2014). In such a situation, monetary policy has to remain expansionary. Even when there is solid economic growth, monetary policy orientated towards financial market excesses may lead to severe losses because the interest rate rises have to be sharp enough to curb the excessive yield expectations. Second, monetary policy in the euro area cannot act in a targeted manner on a country-specific basis, whereas this is possible if macroprudential instruments are activated. Third, monetary policy has only a limited effect as a countermeasure if the pass-through of an interest rate rise does not reach the overheated parts of the financial cycle. The Fed's raising of the interest rates from 2005 hardly affected the development of the mortgage rates which continued to move sideways despite higher federal fund rates.

To sum up, there are good reasons to suggest that monetary policy should be orientated towards price stability and macroprudential policy towards financial stability (Bundesbank, 2015a). Possible conflicting objectives need only be harmonised if one of the two objectives is at acute and massive risk. Otherwise each policy area can pursue its respective objective most efficiently alone.

Is financial market stability at risk?

In this section we examine the question of whether destabilising effects can already be observed in the financial markets and whether the stability of the financial markets is therefore

at risk. First we will attempt to estimate whether the development of different asset prices over time and countries is rooted in fundamentals. After that, the focus will move to capital allocation in the banking and shadow banking sectors. The role of institutional investors and their response to the negative interest environment have a decisive influence on the financial market. The resulting changes in the aggregate balance sheet positions of the individual actors (banks, investment funds, insurances, etc.) thus constitute key indicators for possible misallocations and perceived risks. The section ends with a description of the institutes which are subject to particular interest rate risk.

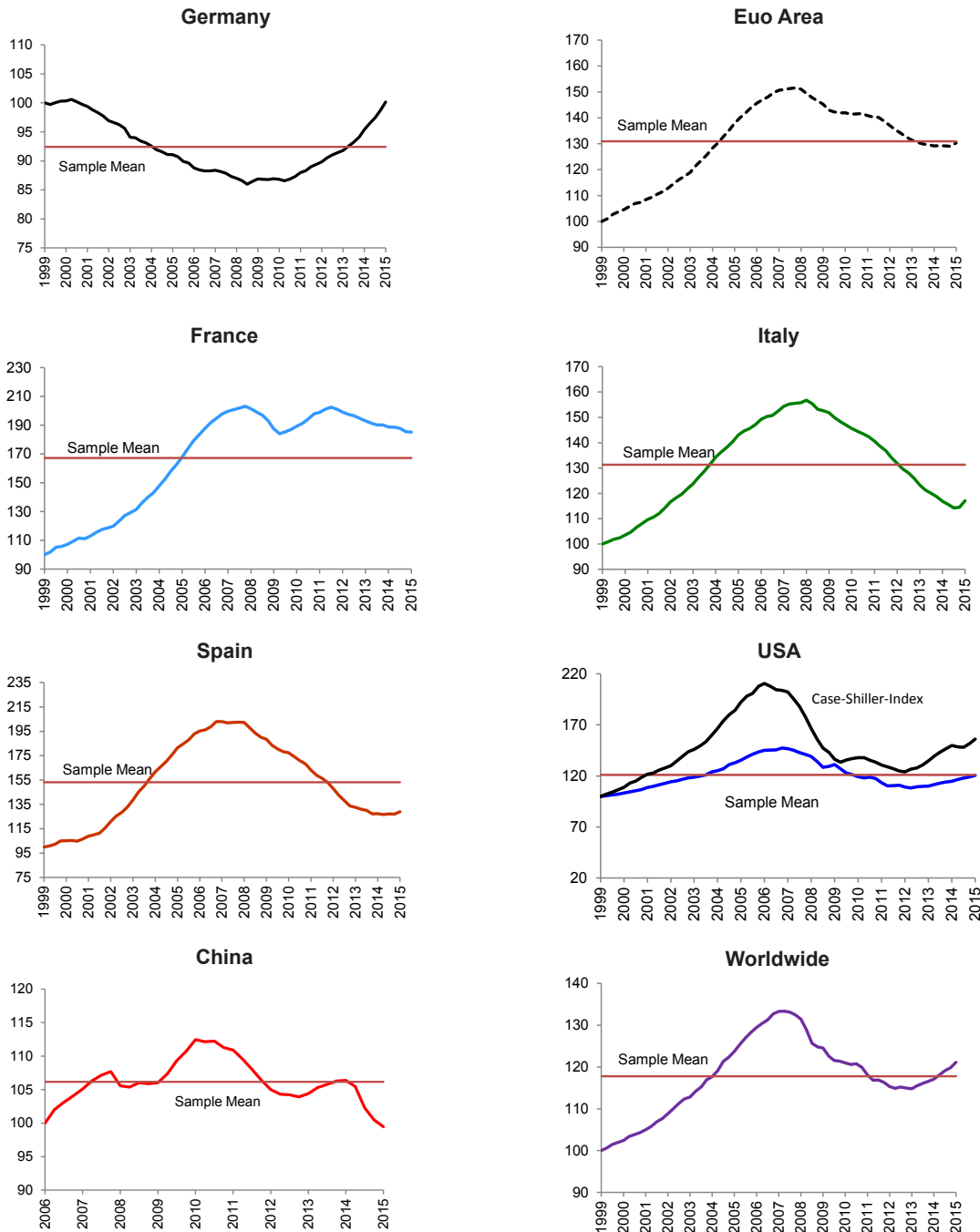
Property prices

Figure 2 shows the development of real global property price indices based on data published by the Federal Reserve Bank of Dallas. For comparison purposes, the mean value of the observations in the respective region is shown between 1999 and 2015. After the fall in prices following the financial market crisis, the aggregate figures for both global and European price developments have returned approximately to the average level for the entire observation period. According to these figures, even the most recent property price rises in the USA provide no grounds for diagnosing overvaluation. This impression is not as unambiguous when the observation is limited to the metropolitan areas according to the Case-Shiller index. Following a significant decline in 2014, property prices in China are below the average in the observation period. This decline is partly the result of a build-up of overcapacity, while the average in the observation period is relatively high due to limited data availability.

Within Europe there are noticeable differences. While property prices in Germany and France are above their mean value, the current price level in Spain and Italy is significantly below. In Spain, where property prices fell sharply between 2008 and 2013 after the speculative bubble burst and

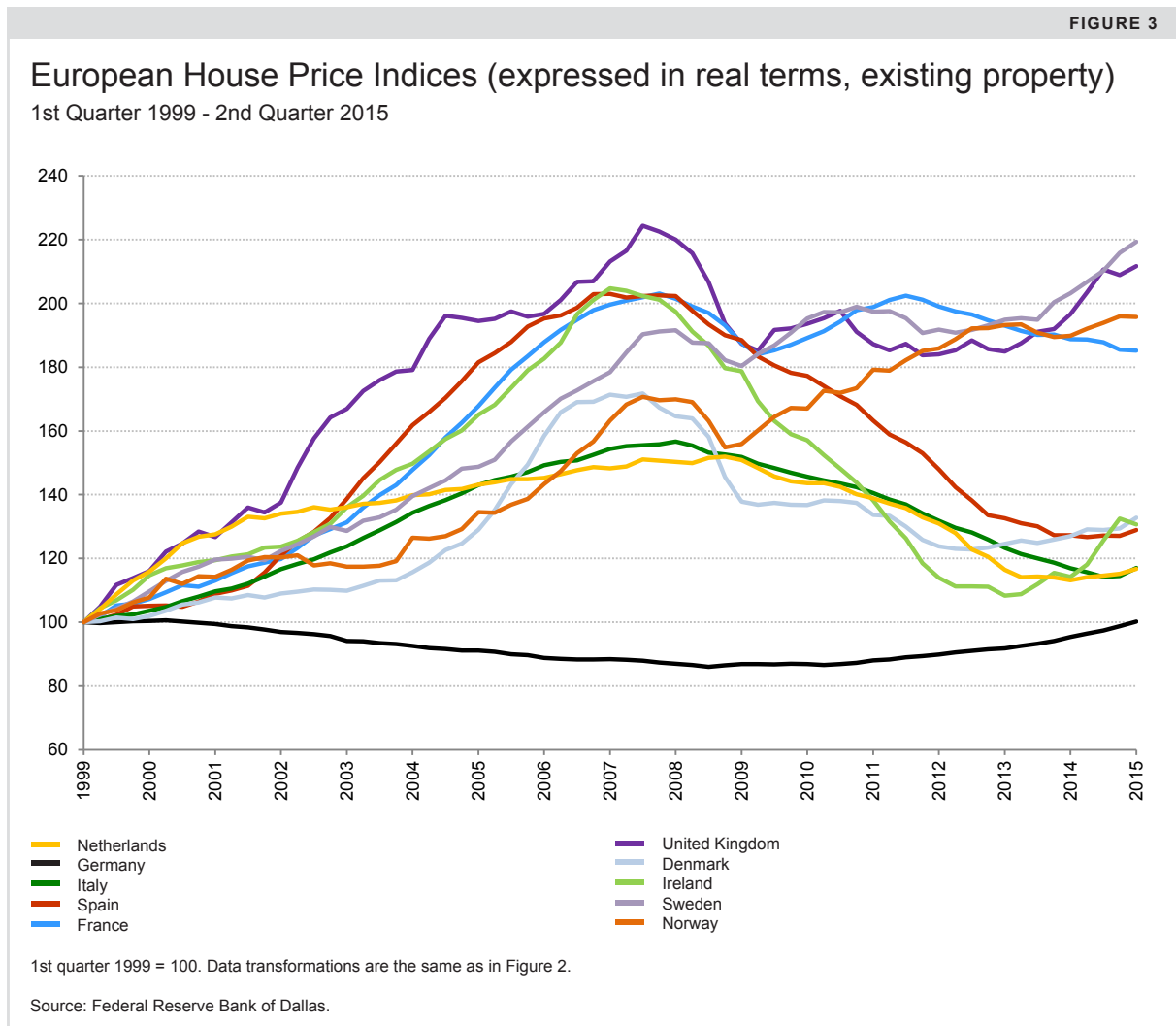
FIGURE 2

International House Price Indices (expressed in real terms, existing property)
1st Quarter 1999 - 1st Quarter 2015



1st quarter 1999 = 100 except for China. The data is seasonally adjusted and deflated by the Federal Reserve Bank of Dallas (using the consumption deflator). The global index is composed of 23 countries, the euro area one of 5 countries and the one for China of 70 cities. Those indices are based on own calculations and comparability is therefore limited. The Case-Shiller Index (black line) covers property prices of 10 US metropolitan areas. It is widely acknowledged as a leading indicator of nationwide price dynamics in the real estate sector.

Sources: Federal Reserve Bank of Dallas; National Bureau of Statistics of China; OECD; own calculations.



depressed economic performance, the property price level has hardly changed since. In Italy, the first noticeable rise since 2008 has only recently been registered.⁸

Figure 3 focuses on the European property price indices. The recent price increases in Germany, which will be explained in more detail below, seem negligible in such a country comparison. In the rest of the EU, property price development falls into two distinct categories. While there were significant price corrections in one group of countries (including not only Italy and Spain but also Denmark, Ireland and the Netherlands), the indices for Sweden, the UK, Norway and France only fell briefly after the crisis and are currently around their pre-crisis levels. In

these countries, therefore, there are grounds for intervention for the purpose of stabilisation.

Among the countries in the second group, the only country directly affected by the ECB's unconventional monetary policy measures is France. As Figure 3 illustrates, however, property prices are falling in France, unlike in the UK, Norway and Sweden, and are gradually approaching their long-term average (Figure 2), which suggests the beginnings of a correction of possible overvaluation.

Property price development in Germany is by no means homogeneous. The Bundesbank (2014a) estimates overvaluation of property prices in Germany's seven largest cities at over 20 % and also assumes that prices are overval-

THE AGGREGATE FIGURES PROVIDE NO EVIDENCE OF EXCESSIVE LENDING GROWTH OR OF EXCESSIVE LOOSENING OF LENDING STANDARDS

ued by between 10 and 20 % in a further 93 cities. A useful indicator for judging the significance of the regionally very different price increases for financial market stability is mortgage lending. The recent property price bubbles in the USA and Spain, for example, were accompanied by a sharp rise in mortgage lending following loosening of lending standards. As a result, after the bubbles burst many families who had taken out loans found themselves faced with high debts and falling asset values, which in turn led to a decline in activity in the real economy. The annual rise in private housing mortgage lending in Germany, which accounts for approximately 40 % of domestic demand for loans, was only 2.2 % in 2014. However, mortgage lending growth in the first six months of 2015 was unusually high at 1.8 % compared to the second half of 2014. Additionally, in earlier studies growth rates of more than 5 % were recorded in metropolitan areas in 2013 (Bundesbank 2014a, p. 64). In one third of the loans studied, the volume of the loan exceeded the collateral value. As already stated above, however, the aggregate figures provide no evidence of excessive lending growth or of excessive loosening of lending standards.

Share prices

Figure 4 shows the development of various share prices from early 1999 to July 2015. The comparison point for the analysis is the average index position in the observation period. Even

though the share indices have recently fallen considerably on account of fears of weaker GDP growth in China and other emerging markets, analysis of the data ending in July remains of interest against the background of a possible correlation between the monetary measures and rising asset prices. Also, remarkable differences can be seen between countries.

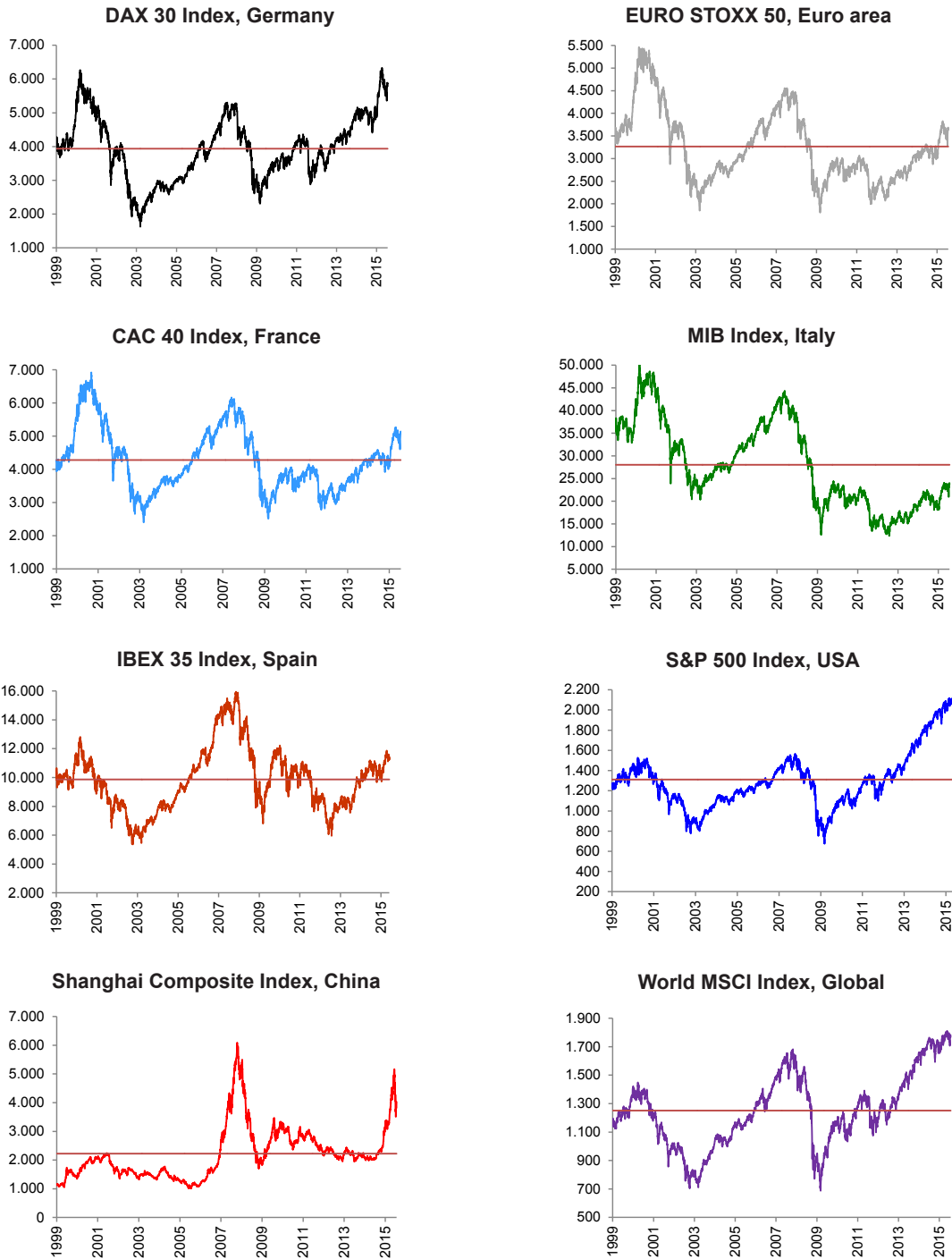
In March 2015, Germany's DAX 30 share price index first passed the level reached before the dotcom bubble burst in early 2000, having more than doubled since its low point in early 2009 (Figure 4). If one compares this development with the EURO STOXX 50 and the leading indices of the three largest economies in the euro area after Germany (France, Italy and Spain), it is remarkable that their levels were significantly below the peaks prior to the dotcom bubble of 2000 and the financial market crisis of 2007/2008. European share price movements in 2015 have temporarily been characterised by uncertainties regarding the negotiations of a new rescue package for Greece. In contrast, in July 2015 the US S&P 500 significantly exceeded its peaks of 2000 and 2007 and had trebled in value since its low point in 2009. China's Shanghai Composite Index differs from the European indices and the S&P index, firstly because there are no visible effects of the dotcom bubble. Secondly, the share price gains prior to and during the global financial crisis and the subsequent correction, when the bubble burst, were sharper and took place within a shorter period. Also, the index posted a dramatic rise of more than 100 % in 2014, followed by an almost equally dramatic downward correction since the end of May 2015.

If one attempts to identify those countries with possible overvaluation on the basis of the respective average index levels in Figure 4, Germany and the USA stand out.⁹ In the USA, where unconventional monetary policy instruments were introduced already in 2009 and have since been phased out, share prices have risen somewhat more sharply than in Germany, but the economy there has also recovered more strongly

FIGURE 4

International Stock Market Indices (Price Index)

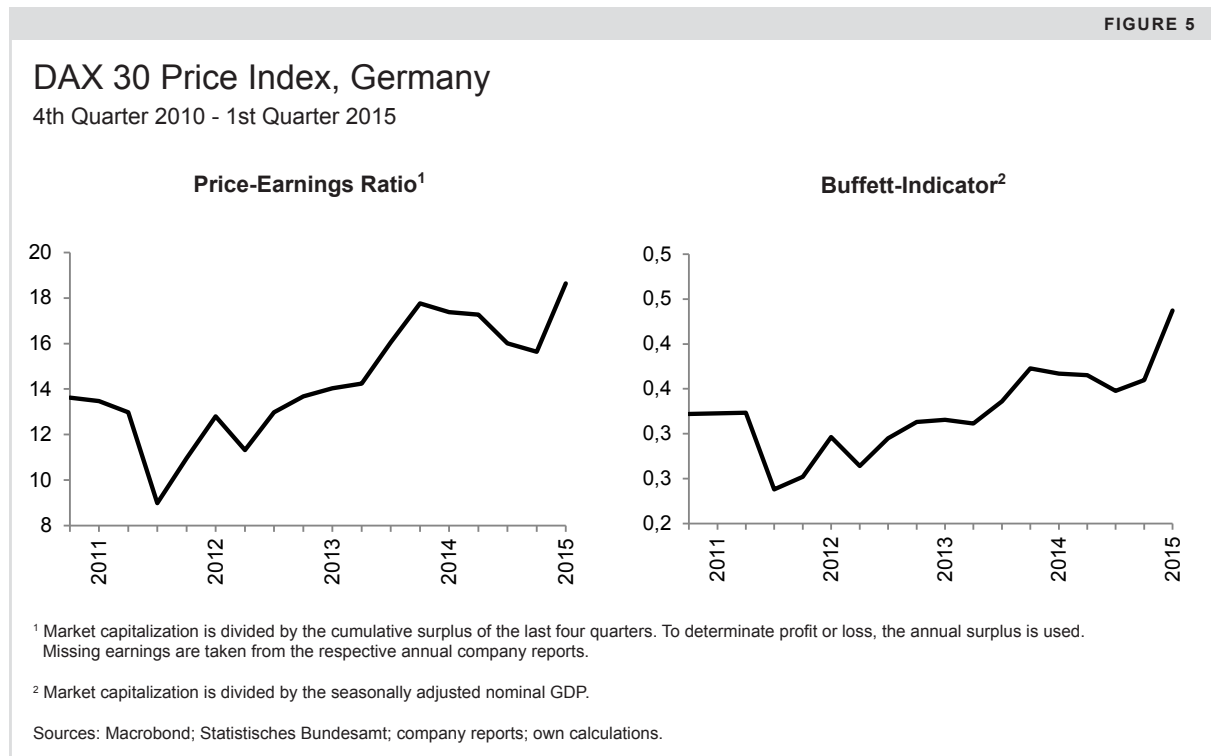
January 1999 - July 2015, daily values



The horizontal line (dark red) denotes the average value of the respective index during the observation period. The price indices are quoted in domestic currency, the MSCI in USD. Price index means without reinvestment of dividends.

Sources: Macrobond; Deutsche Boerse; STOXX; NYSE Euronext; Standard & Poor's; Shanghai Stock Exchange; MSCIBarra.

FIGURE 5



than in Germany since the financial crisis. Moreover, when interest rates are raised again in the USA, this will contribute to slowing the upward trend in US share prices.

The question for the German share index is whether the rise of the DAX, and to a more limited extent other European indices, can still be explained by fundamentals or whether these rises have been driven to such an extent by the effects of the low-interest environment that they are now particularly sensitive to macroeconomic shocks, thus making price corrections probable. Figures 5 and 6 represent an attempt to estimate the deviation between observed and fundamental market development on the basis of various key indicators. This is particularly relevant for judging the possible influence of monetary policy against the background of QE continuing for some time to come.

The price-to-earnings ratio (P/E) of the DAX index in the first quarter of 2015 was 18.6, which is nearly double that at its low point in mid-2011 (Figure 5, left). While high P/E values until mid-2010 were due to lower corporate profits, the

sharp rise in the observation period was contingent on an over-proportionate increase in market capitalisation in relation to corporate profits – i.e. upon higher valuation of the shares.

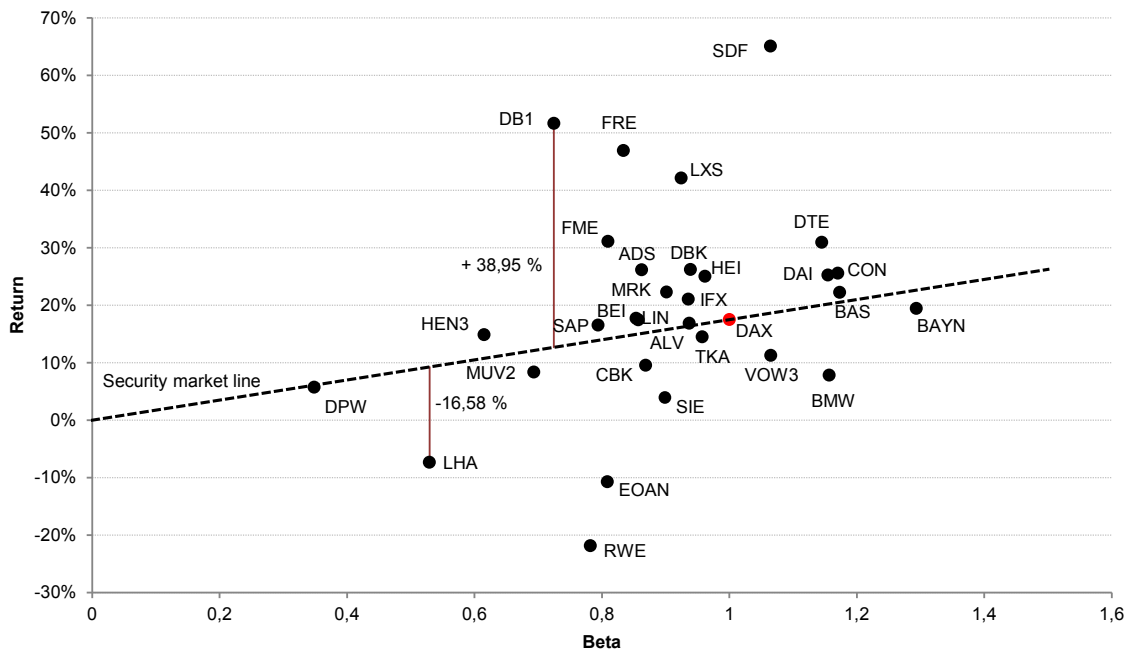
The Buffett Indicator, which places market capitalisation in relation to GDP, reached a level of 0.44 in the first quarter of 2015 – an increase of 35 % since the first quarter of 2011 (Figure 5, right). This increase above the long-term trend since 1991 therefore also suggests that the shares are overvalued.

A further indication against the share price development in Germany between January and July 2015 being driven primarily by fundamental valuation is an analysis according to the capital asset pricing model (CAPM) (Figure 6). Although this model assumes a perfect capital market and is therefore hardly valid in empirical terms over a longer period of time, if one follows the logic of the model and assumes that the fundamental share values are correctly given by the CAPM,¹⁰ it is interesting to examine the magnitude of the divergences between actually observed risk-return characteristics of individual shares and the

FIGURE 6

Return-Risk allocation of the Capital Asset Pricing Model (CAPM) for shares listed in the German stock market index DAX

January 2015 - July 2015, daily values



The acronyms correspond to the 30 companies listed in the stock market index DAX. Returns include price increases and dividend payments. The risk-free interest rate for the observation period is set to 0.02 % (0.05 % pa, equivalent to the ECB federal fund rate). As the market portfolio, the DAX itself is selected. The observation sample roughly corresponds to the period since the announcement of quantitative easing by the ECB. The securities line indicates the return predicted by the CAPM for a given beta factor (which in turn is a risk measure based on the correlation of returns between a security and the market portfolio). The majority (19) of the 30 DAX shares is located above the securities line, since their observed return is higher than the predicted rate of the CAPM. For instance, in case of the German Stock Exchange (DB1), this difference amounts to 38.95 %. For the remaining 11 shares, the difference between market observation and model prediction is negative.

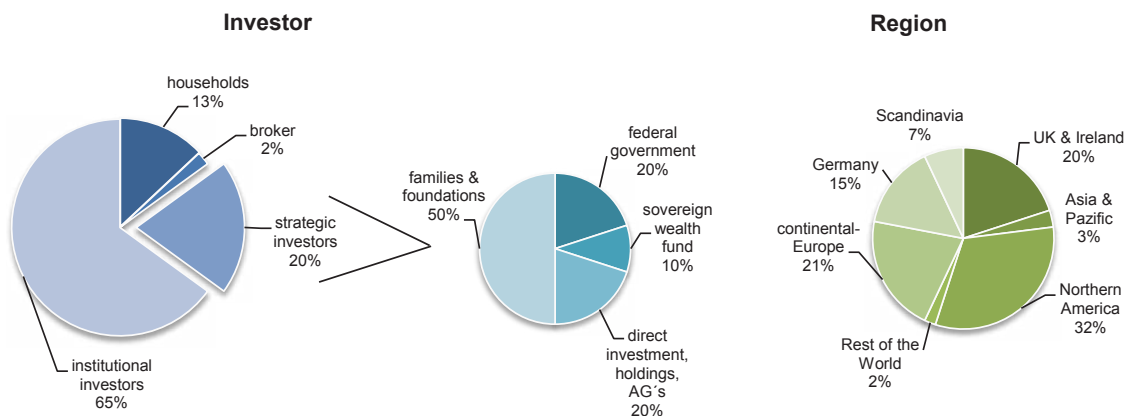
Sources: Macrobond; own calculations.

THE QUESTION FOR THE GERMAN SHARE INDEX IS WHETHER THE RISE OF THE DAX, AND TO A MORE LIMITED EXTENT OTHER EUROPEAN INDICES, CAN STILL BE EXPLAINED BY FUNDAMENTALS

model benchmark, the so-called security market line. Evidence against the hypothesis that the risk-return development of individual shares in the observation period was consistent with the DAX index as a market portfolio is given if the return on individual shares lies significantly above the security market line. As Figure 6 shows, this constellation can be found for a large number of individual shares. For instance, there are four individual shares for which the return is 15 percentage points higher than would be expected according to the CAPM. One conclusion of this analysis could be that market participants paid little attention to a model-based fundamental valuation at least in the short term – in this case

FIGURE 7

Shareholders of the companies listed in the German stock index DAX at the end of 2014



The share of institutional investors has increased since the end of 2013 from 63 % to 65 %. In return, the share of retail investors has decreased by 2 percentage points. The share of German investors fell by 5 percentage points compared to the year before. North American investors still represent the largest group despite a slight reduction. Continental European investors and those from the UK increased their share slightly.

Sources: Ipreo Ltd. and DIRK e.V. (2015).

between January and July 2015. In other words, the causes responsible for the share price development in the observation period must be outside the logic of the CAPM. This could support the hypothesis that part of the share price rise was due to financial investments that were sought after in search of higher returns in the low-interest environment, regardless of whether there was positive new information on the companies' earnings or not.

To end this section, it is worth looking at the investor structure of the DAX index (Fig. 7). Even though it is necessary to use data from the beginning of the year, there is nothing to suggest that the share price increases have in the meantime led to an increase in direct participation on the part of private households. The level of participation of German households in the stock market is similar to that in most of the other economies in the euro area, like France, for example, in being low compared with the Anglo-Saxon capital market-based finance systems. The proportion of foreign investors in the German stock market rose by 5 percentage points from

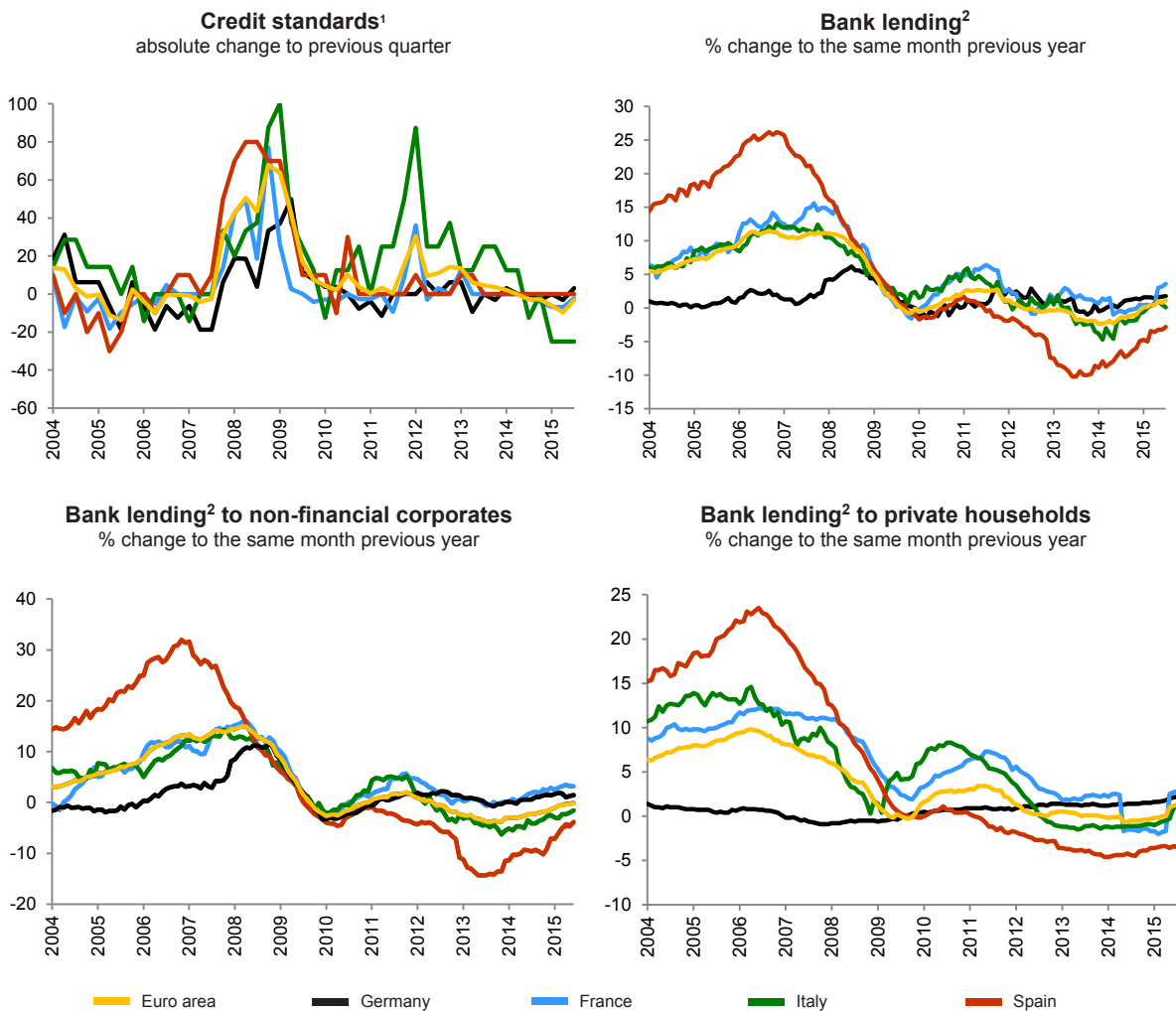
the end of 2013 to the end of 2014. In addition, institutional investors increased their share of total shareholdings by 2 percentage points to 65 % in the same observation period. This leads to the conclusion that the investment behaviour of institutional investors, particularly that of investment funds, is central to the development of the share prices. This will be of particular relevance in the analysis of the rising investment values in investment funds discussed later on.

Risk taking in the banking sector

Figure 8 shows the change in lending standards and in loans according to the monetary statistics for the Eurosystem. In the course of the international financial crisis and the subsequent euro crisis, lending standards were tightened markedly across the entire euro area (Fig. 8, top left). This was followed by a lengthy phase for most countries in which tough lending standards remained virtually unchanged, and only since the beginning of this year has a slight easing been noticeable.¹¹ As mentioned above, the extent of this easing is in no way likely to suggest any

FIGURE 8

Credit standards und bank lending in the euro area



¹ Observation period: 1st quarter 2004 - 2nd quarter 2015, quarterly data. The underlying question of the ECB Bank Lending Survey is „How have credit standards for new loans over the last 3 months changed?“ Zero means no net tightening of credit standards, positive values correspond to a tightening (100 % = all banks raise their credit standards), negative values correspond to a loosening.

² Observation period: January, 2004 - June 2015, monthly data. The rates of change (in %) are based on the aggregated balance sheet statistics of the monetary financial institutions (MFIs). In detail, rates are linked to new loans from MFIs (banks and money market funds, excluding central banks) to private, non-monetary borrowers (companies or households) with residence in the euro area.

Sources: Macrobond; ECB Bank Lending Survey; Monetary statistic of the European System of Central Banks (ESCB).

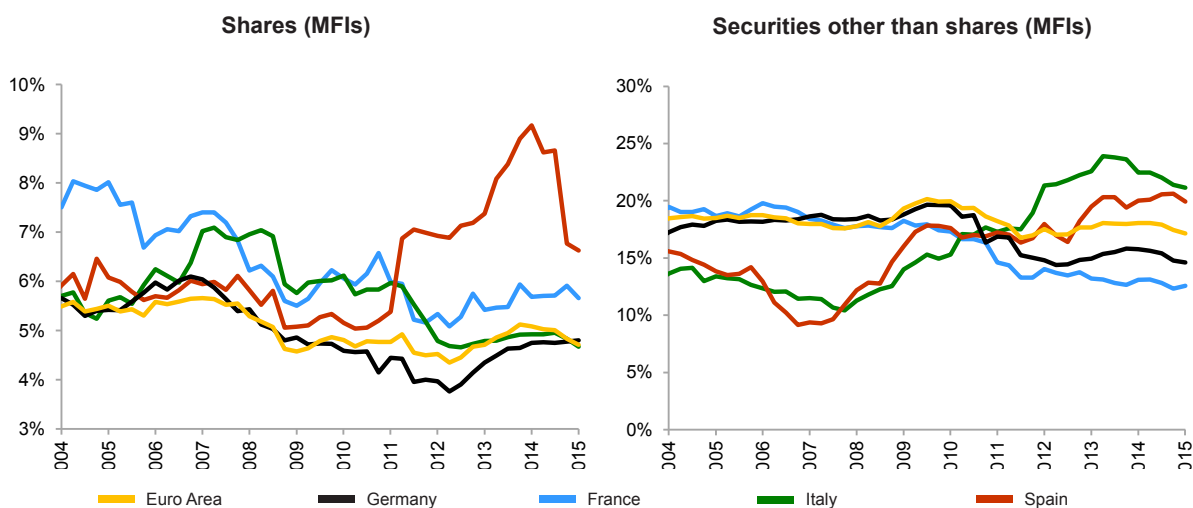
excessive assumption of credit risks on the part of the banks as a consequence of the unconventional monetary policy. A similar picture can be seen with regard to actual lending (Fig. 8, top right and bottom left). In the years leading up to the financial crisis, other than in Germany, very strong growth could be observed. In the course of

the global financial crisis and the eurozone crisis, growth rates could be seen to decline, particularly in Spain where lending to companies and private households was severely curtailed after the credit-financed property bubble burst. It is also noticeable that volatility in the development of lending to private households in Germany is

FIGURE 9

Selected positions in the aggregated balance sheet of monetary financial institutions (MFIs)

1st Quarter 2004 - 1st Quarter 2015



Illustrated are shares and other equity (incl. shares in mutual funds, other than shares in money market funds) as a proportion of total assets of MFIs (banks and money market funds, excl. central banks) and securities other than shares (incl. financial derivatives) as a proportion of total assets of MFIs (banks and money market funds, excl. central banks).

Sources: Macrobond: Monetary statistic of the European System of Central Banks (ESCB); own calculations.

comparably low and, unlike in the other countries, shows virtually no correlation with the development of lending to companies. An uptick in lending can be seen at the end point for the largest economies in the euro area. For Italy and Spain, however, this only means a decline in net repayments. Thus far, there has been no appreciable recovery in lending or, in particular, in investment. Against the background of the current data there need be no fears of aggregate lending in the euro area reaching a dangerous level for financial market stability in the foreseeable future.

Figure 9 shows the share of selected positions in the aggregate balance sheet totals of monetary financial institutions in the euro area. In addition to bank lending, these give an impression of whether the banks are increasingly building up risk positions, while distinguishing between market risk from shares (Fig. 9, left) and risk from other securities positions (Fig. 9, right). In

the latter case, these are both credit and market risk positions. The latter balance sheet position includes, for example, both fixed-interest securities and financial derivatives. With the exception of Spain, in all the eurozone countries examined here, the proportion of shares and other equity securities on bank balance sheets has declined since the mid-2000s. There is no sign of a trend reversal at the endpoint here either. The share of other securities positions has also fallen slightly throughout the entire euro area during the observation period. What is striking here, however, is the different development in the individual countries. These positions are decreasing significantly among German and French banks, while they are still being increased by Italian and Spanish ones.

In both countries there has recently been an increase in purchasing of financial derivatives and, in Italy, of eurozone sovereign bonds (Bundesbank 2015a). Against the background of the performance of Italian institutions¹² in the

comprehensive assessment at the beginning of the European Banking Union (ECB 2014) and the persistently high adjustments for non-performing loans¹³ in both countries (IMF, 2015b), this development should be viewed critically on the part of the European supervisory authorities.¹⁴

Despite comparatively low yields, the risk-bearing capacity of German banks has improved in recent years. For example, their absolute leverage ratio, defined here as the banks' core capital in relation to their total assets,¹⁵ had risen from approximately 3 % at the beginning of 2012 to more than 3.5 % by the end of 2013. At the same time, their core capital ratio, which places core capital in relation to risk-weighted assets, rose from approximately 12 % to over 15 % (Bundesbank, 2013). Despite these improvements, as a result of the implementation of the capital requirements of Basel III, German and European financial institutions in general continue to lag behind their US counterparts in terms of absolute leverage ratio (Hoenig, 2014). Also in terms of the number of market exits since the financial crisis, the degree of structural adjustment in the European and German banking sectors has been lower.

In 2013 operative earnings at German banks reached their lowest level since the financial crisis (Bundesbank, 2014c). Apart from commission income, all other components (net interest income, net earnings on the trading portfolio, other operating income and expenses) suffered losses. As can be seen from the development of the total assets of monetary financial institu-

tions (MFIs) in Figure 12 (page 19), consolidated business volume also declined. The decline in interest income for 2013 was not due to deterioration of the margin between the traditional loan and deposit business, but due to the other components included in interest income comprising other income from equities, investment fund shares and shareholdings. Write-downs of loans (valuation adjustments) were moderate on the whole at all banks, the only negative exceptions being some Landesbanken which stood out due to impairment losses on ship financing schemes. Despite a flattening of the yield curve, the earnings situation at German monetary financial institutions was more favourable than expected in 2014 (Bundesbank, 2015c). Net interest income recovered year on year, for example, thanks in particular to the expansion of lending volume and lower refinancing expenses.

Keeping in mind that operating profits (after valuation) were also still significantly above the long-term average in 2013 (Bundesbank, 2014c), the earnings situation of banks in Germany does not appear worrying from the viewpoint of financial stability. In addition, it is welcome that the banks' risk-bearing capacity has strengthened and that their aggregate balance sheet positions show hardly any signs of them conducting too risky operations.

Global regulation of derivatives markets is behind schedule

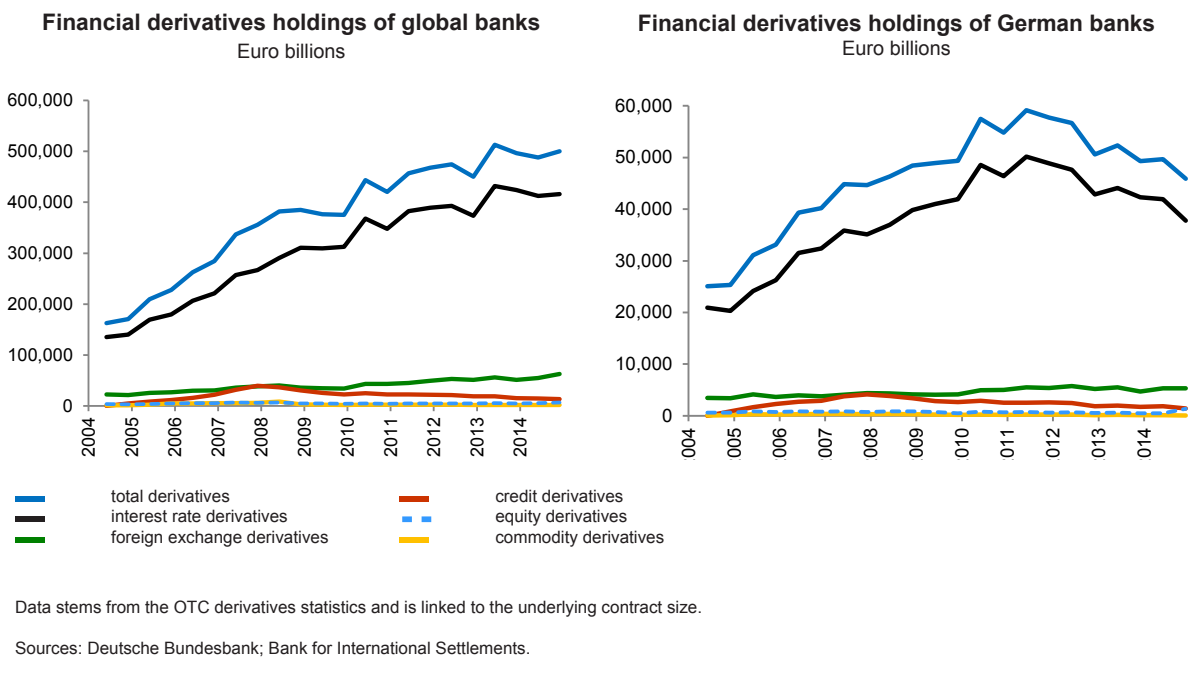
The latest financial market crisis showed that one of the greatest sources of risk to financial market stability lay in financial derivatives.¹⁶ While German banks have curbed their activities in over-the-counter (OTC) derivatives trading since 2011, the nominal value of derivatives holdings continued to rise globally until the end of 2014 (Fig. 10). The increase in trading in foreign exchange derivatives is probably connected with the strong volatility of several exchange rates in the observation period. It remains unclear, however, how many transactions are speculative in nature. The increase in trading in interest

**DESPITE COMPARATIVELY
LOW YIELDS, THE RISK-
BEARING CAPACITY OF
GERMAN BANKS HAS
IMPROVED IN RECENT
YEARS**

FIGURE 10

Nominal values of financial derivatives holdings

2004 - 2014, semi-annual data



rate derivatives can probably be explained to a great extent by attempts to hedge against rising interest rates in the low-interest environments of several developed economies. Such hedging against interest rate risk is only illusory, however, if counterparty risk is not sufficiently hedged at the same time.

The global financial market crisis of 2007/2008 demonstrated clearly the extent of systemic risk stemming from the linkage of major market participants through the derivatives markets. In order to counteract this, a package of measures was decided at G-20 level, the most important components of which are the recording of all OTC transactions via a transactions register, the settlement of transactions via central counterparties, the lowering of counterparty risk through margin calls and higher capital adequacy requirements for transactions that are not settled via a central counterparty (CCP). CCPs are intended to assume the counterparty risk of the financial actors involved in the deriva-

tives transaction and disclose and standardise the characteristics of the transaction (maturity, type of underlying asset, etc.). Last but not least, they are only intended to be service providers without their own risk positions. In order for this to function successfully, transactions are valued daily and, depending on the development of the transaction's value, deposits are required to be made on collateral accounts (margin calls). As documented by the Bundesbank (2013), implementation of these measures globally, and even in the European Union, has lagged behind the original schedule. Furthermore, implementation has differed significantly in individual countries, as a result of which the risk of regulatory arbitrage has arisen. Regulatory arbitrage describes the practice of bypassing regulatory requirements by relocating to a different place of business, for example. Many special-purpose vehicles involved in securitization, for instance, have their registered offices in Ireland, because in the pre-crisis period, not only were tax rates there low,

but the regulatory requirements were also less strict. At the time of writing this article, the only reliable figures available showing successive shifts of transactions to CCPs came from a US securities service provider (Bundesbank, 2013). These figures also do not in any way suggest that there has been a virtually complete shift to settling new transactions via CCPs. Implementation of the measures agreed at G-20 level makes derivatives transactions more expensive, so that actually a fall in trading volumes would be expected. Hence, the continued increase in nominal values in Figure 10 does not suggest that there has been effective implementation of the agreed G-20 measures so far.

Risks in the shadow banking sector

Money market funds

In the financial market crisis of 2007/2008 it became apparent that there are close ties between banks and non-banks in the global financial system and consequently that focusing regulatory measures on the banking sector is by no means sufficient to maintain financial market stability. Money market funds, for example, play a key part in banks' refinancing operations.¹⁷

Figure 11 illustrates the significance of money market funds for the euro area member countries under consideration. Measured by means of the funds volumes, the overall importance has declined since the financial crisis. Values for France are striking as they have been above the euro area average throughout the entire period. This could be connected with the high number of GSIFs (globally systemically important financial institutions) and the important role of money market funds for these institutions' refinancing activities. In Germany, the proportion of money market fund shares issued is only very small and well below the average for the rest of the euro area. The bottom-right section of Figure 11 shows that the money market fund shares issued as a proportion of total MFI liabilities (yellow line) fell significantly more sharply from 2009 than the

share of money market fund liabilities itself (blue line). This is because within the MFIs the share of the balance sheet total accounted for by money market funds decreased, their volume falling by approx. 35 % between 2009 and 2013, while the volume of the financial institutes (mainly banks) remained virtually unchanged (-3 % in the same observation period). From the first quarter of 2014, however, the trend was reversed and the volume of the money market funds has risen more sharply (25 %) than that of the financial institutions (6 %). This trend reversal means that possible risks to financial stability from money market funds have risen again for the first time since the financial market crisis.

Figure 11 (bottom left and right) also shows that European money market funds are increasingly doing business outside the euro area. On the asset side, for example, in the 4th quarter of 2014 the share of receivables from MFIs in the euro area fell for the first time below that of external assets and has remained there since. On the liabilities side, the percentage of shares issued to investors from the euro area fell below that of external liabilities for the first time in the 1st quarter of 2015. Even if the significance of the money market funds as a whole has declined since the financial crisis, their increased business activity outside the euro area may lead to considerable risks – particularly foreign exchange risks.

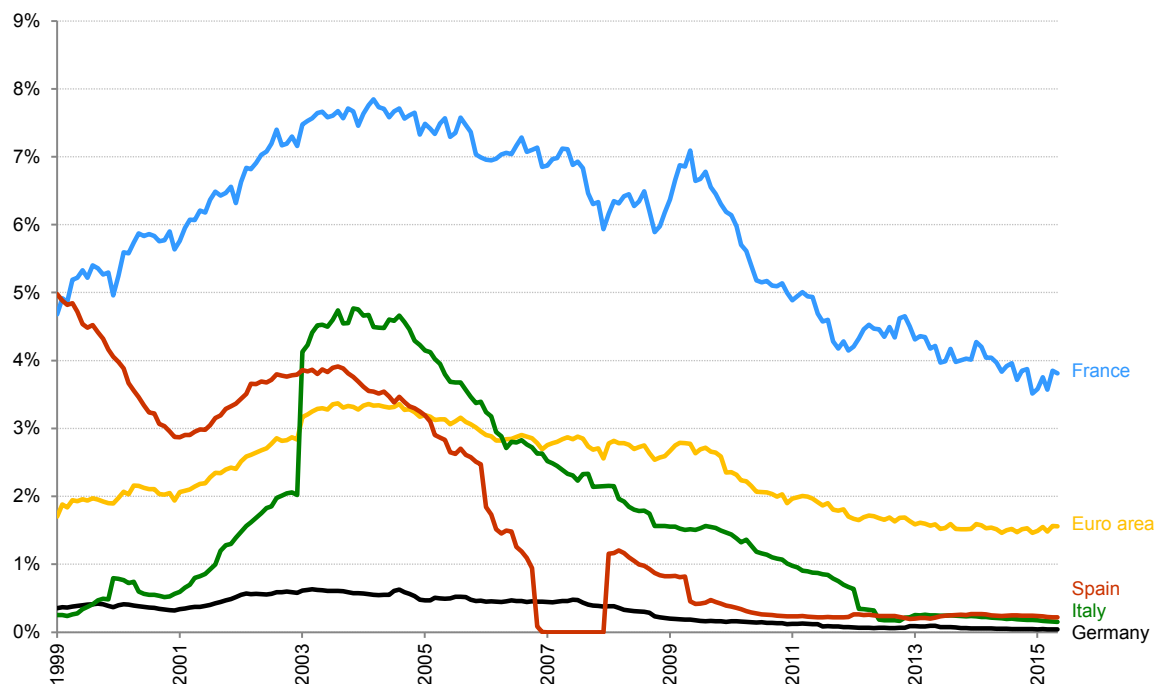
Investment funds

Since 2009 the significance of investment funds for the financial system has increased considerably, as therefore has their relevance for assessing risks to financial market stability. Figure 12 (left-hand side) shows the development of investment fund volumes in the euro area and their composition according to investment type. In total, the volume of the investment funds divided by GDP grew sharply by 25 percentage points from the 1st quarter of 2009 to the 1st quarter of 2015, while this ratio fell by 3 % for MFIs. In addition to the resulting increase in the significance of investment funds, it can be observed that over

FIGURE 11

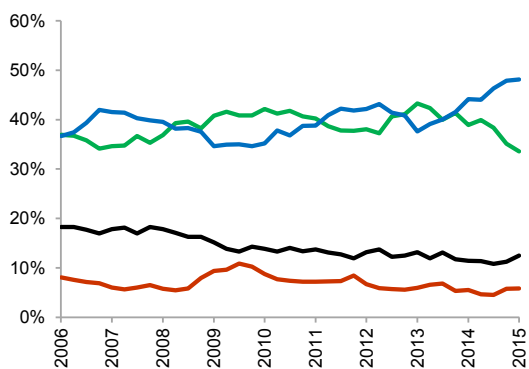
Evolution of European money market funds

Money market fund shares issued as a proportion of total liabilities of monetary financial institutes (MFIs), January 1999 - May 2015



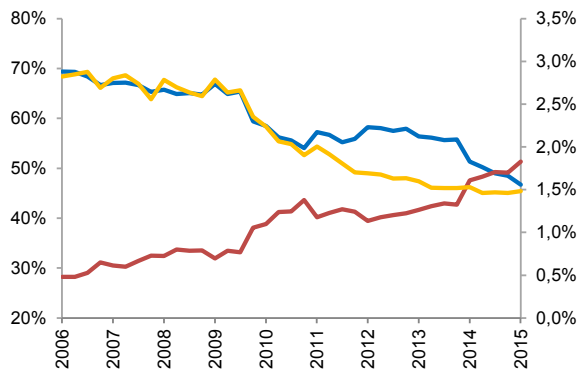
Illustrated are money market fund shares issued to euro area residents.

Assets of money market funds¹



- External assets, counterpart: Extra euro area
- Other assets
- Loans and securities, counterpart: euro area MFIs
- Loans and securities, counterpart: euro area general government

Liabilities of money market funds²



- Money market fund shares issued as a proportion of total liabilities of money market funds (left axis)
- Money market fund shares issued as a proportion of total liabilities of MFIs (right axis)
- External liabilities, counterpart: extra euro area

¹ 1st quarter 2006 - 1st quarter 2015, quarterly data. Loans and securities with counterpart euro area MFIs or general government include all type of credit. Securities are others than shares. All items are illustrated as a proportion of total assets of money market funds.

² 1st quarter 2006 - 1st quarter 2015, quarterly data. Money market fund shares issued as a proportion of total liabilities of money market funds and external liabilities add up to 1. Money market fund shares issued as a proportion of total liabilities of MFIs are the same as in the sub-figure at the top.

Sources: Macrobond; Monetary statistic of the European System of Central Banks (ESCB); own calculations.

the same period their investment structure has shifted from relatively secure assets (deposits and loans: -47 %) to riskier investments (shares and other equity: +21 %, investment fund shares: +110 %). In addition, investment funds show rising net inflows from other systemically relevant market participants and they are increasingly investing in lower investment-grade corporate bonds (Bundesbank, 2014a).

The principal danger for financial market stability is that in an environment of decreasing value of the underlying assets, many investors will redeem their fund shares. In such a case, either revaluation losses will have to be realised on those assets such as corporate bonds, or other (more liquid) assets will have to be sold. The former would exacerbate the fall in value; the latter would lead to contagion in other areas of the market. In Germany the major investment fund providers are closely linked to the banking sector. In order to maintain customers' trust, it is highly probable that banks too would be affected if an investment fund found itself in difficulties. To that extent, a critical view should be taken of the shift of financial investments from the more tightly regulated banking sector to investment funds.

The Bundesbank also sees growing risk appetite globally in the inflows into hedge and credit funds (Bundesbank, 2014a, p. 32). Hedge funds leverage their capital inflows by means of additional borrowing and investments in derivatives. This leverage increased in 2013 and 2014. Investment funds based in Germany are not permitted to grant loans without a banking licence, but due to permission being granted in other EU countries and the existence of freedom of services in the Single Market, the granting of loans to domestic lenders by funds based abroad cannot be ruled out. Furthermore, credit funds are attractive investments for insurance companies because they are recorded in the accounts as equity holdings and as such, in accordance with investment regulations, qualify for a higher investment ratio than securitised loans or hedge funds. These examples illustrate how closely

other financial intermediaries are linked with each other, with the banking sector and with the real economy. Therefore, systemic risks may also originate from the shadow banks. However, macroprudential policy instruments have until now focused almost exclusively on the banking sector, thus neglecting the shadow banks.

Insurance companies and pension funds

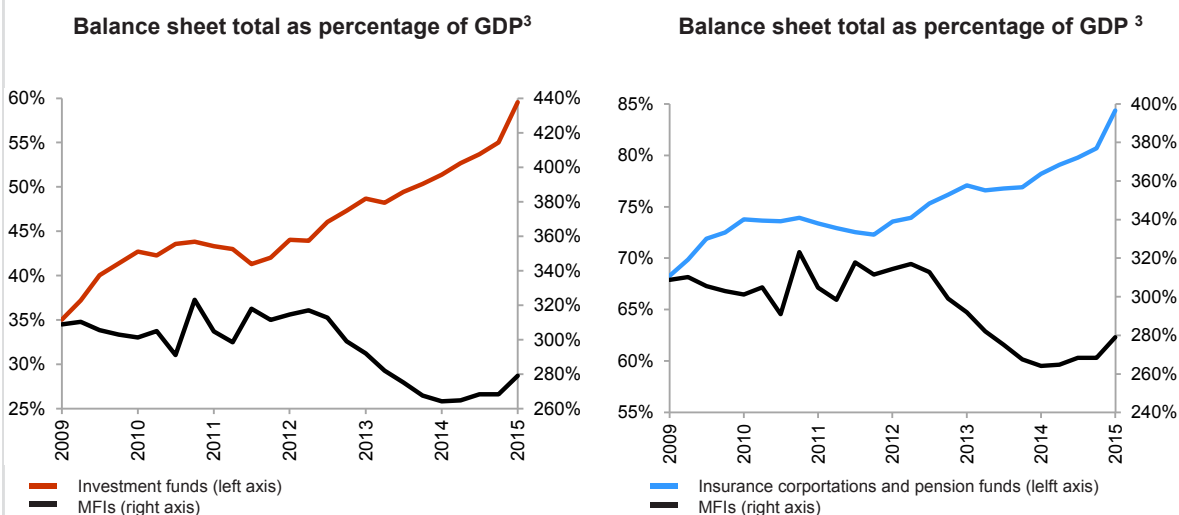
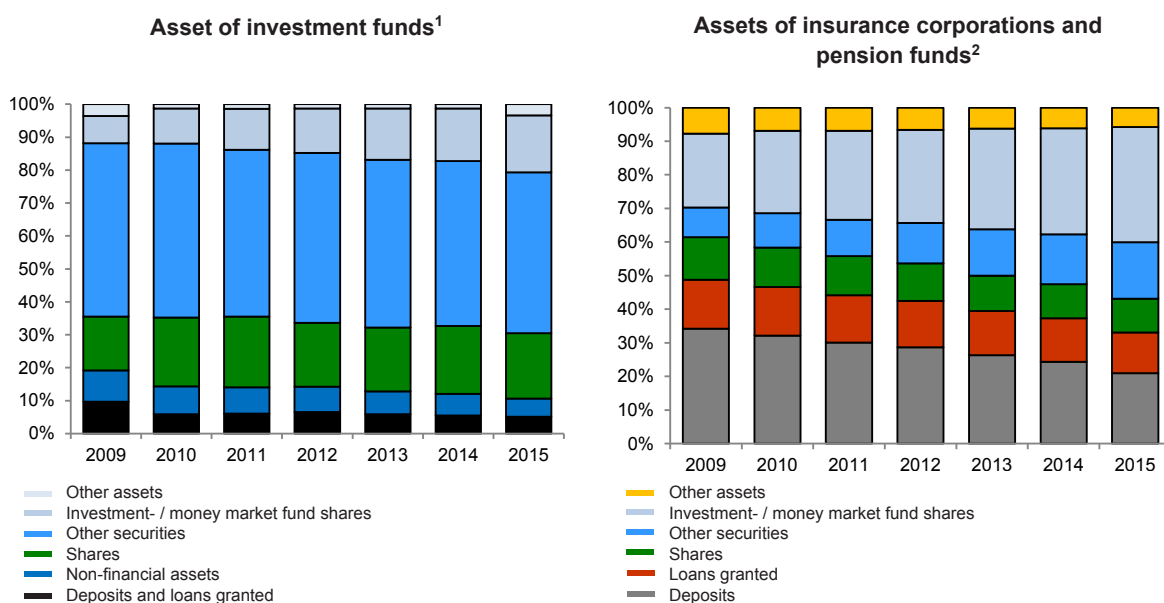
The total assets of insurance companies and pension funds in the euro area have increased significantly since 2009 and there is an obvious trend towards greater risk appetite. Figure 12 (right-hand side) shows the development of the total assets and the composition of the asset side of the balance sheets. The total assets of the insurance companies and pension funds as a percentage of GDP rose by 16 percentage points from the 1st quarter of 2009 to the 1st quarter of 2015. Even though the proportion of shares held fell (-21 %), a general shift towards riskier investments can be observed: deposits (-39 %), other securities (+90 %), investment fund shares (+56 %). The Bundesbank (2014a) also sees a trend towards greater risk appetite on the basis of the rising share of corporate bonds in the insurance companies' investments. This share rose from 4 % in 2011 to just below 7 % in 2014. A major part of these bonds are held through special funds. The proportion of high investment-grade bonds fell, while that of low investment-grade bonds (up to BBB) rose. In addition, insurers are increasingly investing in credit funds (Bundesbank, 2014a, p. 22).

In Germany, new investment regulations for insurance companies were adopted on 25 February 2015 against the background of the current low-interest environment with the objective of making it easier for insurers to make potentially higher-yielding investments (BaFin 2015). With the introduction of the Solvency II rules on 1 January 2016 there will be a further change in the regulatory and capital requirements for the major insurance companies (whereas the new investment regulations will remain valid for pension funds and smaller insurers). On the one hand,

FIGURE 12

Assets of investment funds and insurance corporations (incl. pension funds)

1st Quarter 2009 - 1st Quarter 2015



¹ Deposit and loans granted include bank deposits, other deposits, loans (incl. credit exposures acquired in the secondary market) and reverse repurchase agreements. Non-financial assets are property and goods. Shares exclude those hold by investment funds. Other securities are all tradable debt securities such as government and corporate bonds. All items are illustrated as percentage of total assets.

² Including reinsurance, but without government guarantee schemes and non-autonomous pension funds which are mainly linked to banks or non-financial corporations. Deposits are bank deposits and reverse repurchase agreements. Shares exclude those hold by investment funds. Other securities are all tradable debt securities such as government and corporate bonds. All items are illustrated as percentage of total assets.

³ Gross Domestic Product is seasonally adjusted.

Sources: ESCB statistics; Deutsche Bundesbank; Statistisches Bundesamt; own calculations.

harmonization of minimum capital requirements and the requirements of qualitative and quantitative structuring of risk management represent progress (EU Commission, 2014). On the other hand, the specific structuring both of the standard formula and of approved internal models is not without its critics.¹⁸ It therefore remains to be seen whether Solvency II will be effective in constraining increased risk-taking through financial investments in higher-yielding, and consequently riskier, products.

Stress test for the insurance industry and occupational pensions sector conducted by the European Supervisory Authority (EIOPA 2014, p. 17) examined the resilience of European insurance companies in a stress scenario with long-term low interest rates. Here, compared with their European counterparts in terms of duration, German insurers showed a very high discrepancy between the durations of their assets and liabilities (11.3 years compared with an EU average of 4.6 years). This key indicator means that the average capital commitment duration is 11.3 years longer for liabilities than for assets. If there is no change in their portfolio composition, payments could exceed deposits at some point in the future. In addition to the discrepancy in durations, the test also examined the difference in interest on assets and liabilities. Here, too, German insurers were seen to perform comparatively badly. On the liability side, German life insurance companies provide their policyholders with an interest-rate guarantee, the risks of which are particularly high in a low-interest environment.¹⁹

However, individual insurers (mostly holding companies) which operate in other insurance fields beyond life insurance have the potential to offset this risk through other business activities. In Germany, for example, the aggregate total assets of the three largest insurers accounted for 25 % of the entire market, but their share of the premium income of their parent companies was significantly below 50 %. According to calculations by Claeys and Darvas (2015), the

premium income of the 20 largest companies in life and health insurance accounts for 57 % of total income. Again, there is considerable compensatory potential here. The Life Insurance Reform Act in Germany passed in 2014 provides an additional remedy: policyholders no longer participate only in the hidden reserves but also in the hidden burdens, and dividend payments to shareholders are also limited. According to the Bundesbank (2014b), the market share of at-risk life insurance companies (measured according to premium income) calculated in a stress scenario until 2023 will fall from roughly 43 % to 17 %. This permits the conclusion that the insurance industry can cope with a temporary period of low interest rates without investing excessively in high-return, and therefore high-risk, products. Regulatory limitations of the observed trend towards greater risk appetite, which would be desirable from the point of view of financial stability, are therefore bearable.

Interest rate risks

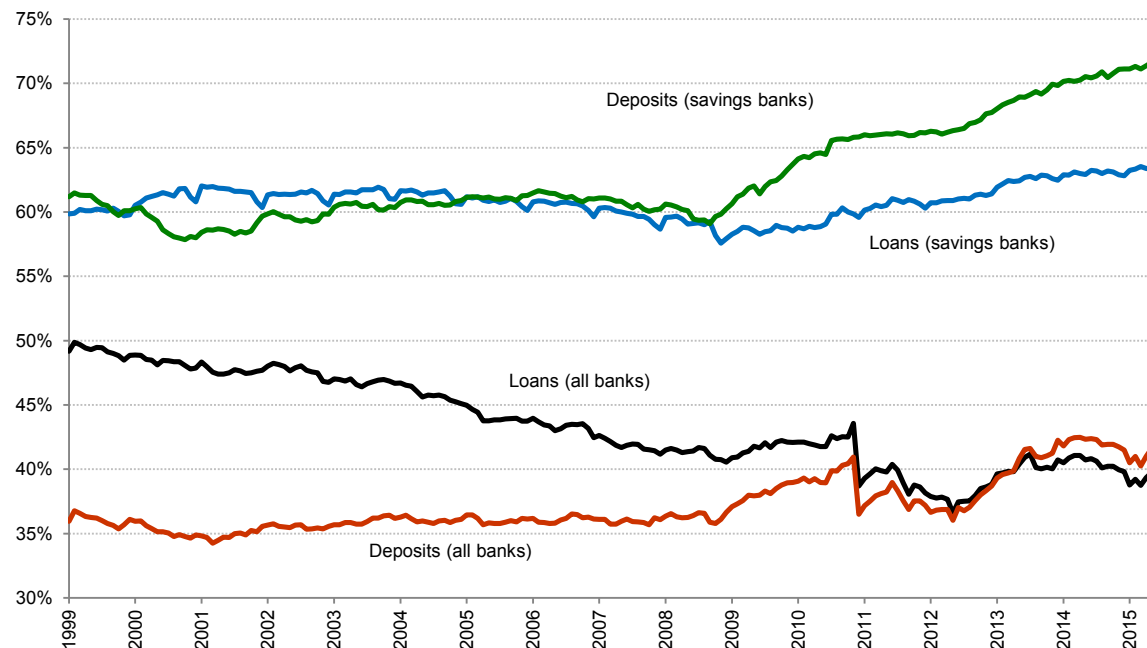
There is no prospect of expansionary monetary policy in the euro area ending soon. In fact, there is even discussion of the unconventional measures being extended if QE does not achieve the desired effects, as suggested in previous sections. Nevertheless, it is important to point out already the risks to financial stability of departing from the low-interest environment and to roughly estimate their magnitude.

In macro stress test scenarios for savings and cooperative banks, the Bundesbank (2014a, p.46) examined the effect of various interest rate scenarios on the returns from maturity transformation, on interest income in total and on the banks' equity. In the baseline scenario it was assumed that the development of short- and long-term interest rates would correspond to the forward rates calculated from the yield curve in June 2014. In a first alternative scenario a continuation of the low-interest environment was assumed for ten years on the basis of the June yield curve. It emerged that the interest

FIGURE 13

Loans to and deposits of non-banks in Germany

January 1999 - May 2015, % of total assets and liabilities



Loans refers to loans to non-banks. Deposits are demand deposits, time deposits and savings deposits of non-banks.

Sources: Deutsche Bundesbank, national bank statistic.

margin – net interest income as a percentage of total assets – remained virtually at the starting level. This scenario would therefore be bearable for all the cooperative institutions. A second alternative scenario assumed a flattening of the yield curve, which had indeed been the case since June 2014.²⁰ Here, the interest margin falls by 0.3 percentage points, which corresponds to interest income losses of at least 10%. Finally, a third alternative scenario assumed a rise of 3.5 percentage points in short-term interest rates after three years. Even though this assumption appears rather exaggerated, the effects of the modelled rate rise are revealing. In the three years following the interest rate shock, the interest margin falls by approx. 0.7 percentage points, which corresponds to a fall in interest income of roughly one third. After that, it returns to the starting level.

As is clearly shown by the Bundesbank stress tests and Figure 13 on the basis of the shares of interest-rate-sensitive bank balance sheet positions, a return to a normal interest environment entails considerable risks for banks and for cooperative institutions in particular, as the majority of their income originates from the difference between

A RETURN TO A NORMAL INTEREST ENVIRONMENT ENTAILS CONSIDERABLE RISKS FOR BANKS AND FOR COOPERATIVE INSTITUTIONS IN PARTICULAR

loan and deposit interest. Therefore, in the discussion concerning savings banks' dividends to their municipal shareholders, from the point of view of financial stability policy makers should favour risk provisioning.²¹ Although the institutions in these two associations are particularly affected, this is not an all-clear signal for other financial institutions, as other market risks may also become relevant when interest rates change.²²

In addition to a possible transfer from the trading book to the portfolio-held-to-maturity,²³ only sufficient risk provisioning can help as a cushion against temporary income losses during the adjustment of the bank balance sheet to the new interest rate level.

ASSESSMENT OF THE SITUATION

The following section provides an overview of the risks to financial market stability exposed above, focusing on the euro area and Germany. Figure 14 shows the IMK Indicator for financial market stress in Germany.²⁴ This indicator consolidates a major part of the volatility of many observable financial market data, in particular those of share prices and commodity prices. If volatility increases significantly, this signals financial market stress. As corresponding stress situations typically arise prior to financial market crises, it is hoped that it will be possible to recognise crisis tendencies as early as possible with the aid of such an indicator. The peaks clearly visible in Figure 14 represent crises, such as the Russia crisis of 1998, the dot-com bubble of 2001, the financial market crisis of 2007/2008 and the euro crisis in 2011/2012. The most recent observation refers to June 2015 and indicates no acute threat to financial market stability. Even though there have been some significant corrections on the stock markets in the meantime, the entire study presented here confirms this assessment. Nevertheless, several developments, especially in the non-bank sector, mentioned in the descriptive analysis (pages 6-21) may bear the seed of future financial market turbulence.

With regard to property prices, major differences are apparent in global terms. Increased vigilance would appear to be called for both in the Anglo-Saxon countries (UK, USA), in which property prices traditionally correlate with economic growth at a higher level,²⁵ and in three European countries (France, Sweden and Norway). In Germany, price increases have concentrated primarily on the major cities (Bundesbank, 2014a). House price increases constitute a particular threat to financial market stability if they coincide with a sharp rise in mortgage lending. Here, there are now new instruments available for macro-prudential regulation, such as changes in risk weighting or activation of the anti-cyclical capital buffer, which should be used actively (Lindner et al. 2014). Belgium, for example, raised risk weighting for internal-ratings-based (IRB) residential mortgage lending by 5 percentage points in May 2015. Although there is a lack of experience in the precise use of these instruments up to now, viewed against the background of the pro-cyclicality of the internal models (Behn et al. 2015, Theobald 2015) it might be a greater mistake not to change the regulatory requirements in such a way that they have an anti-cyclical effect. This means in particular that higher equity requirements must be introduced if very strong lending growth is identified.

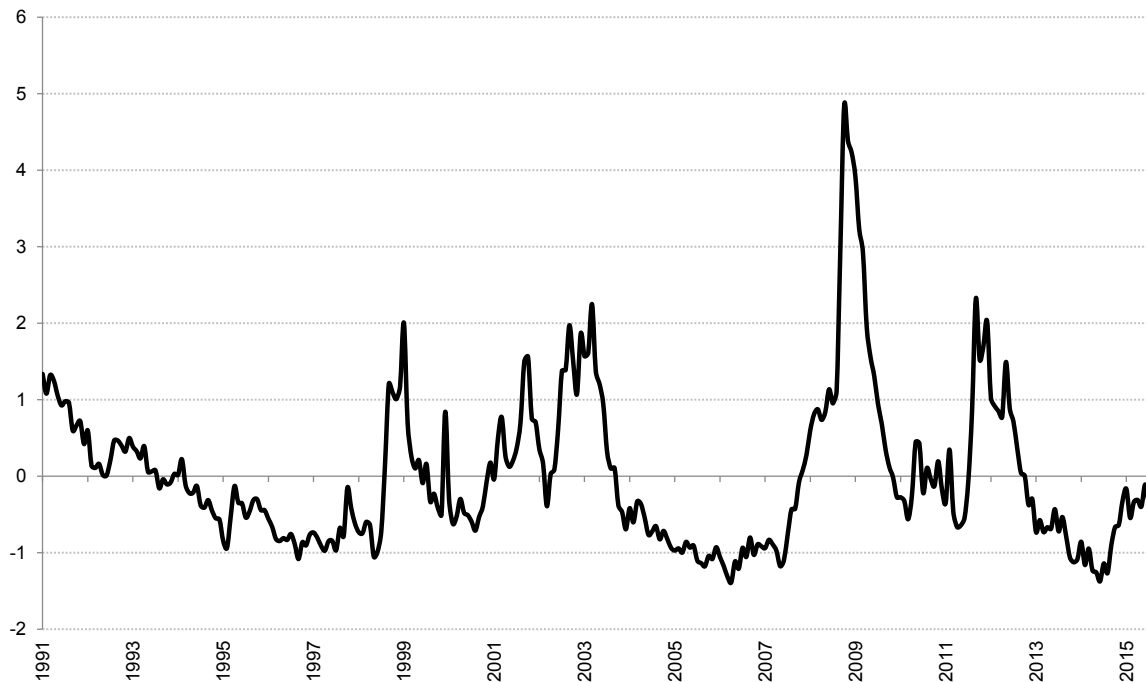
Now that the foreseeable corrections have taken place on the Chinese stock market (Horn et al. 2015), the highest overvaluation potential is on the German and US stock markets. Berg (2015) concludes on the basis of similar ratios to those on pages 10-11 that the US stock market may move from calm to troubled waters at any time, albeit with limited consequences for overall financial stability. Course corrections in global capital flows are to be expected before the end of this year if the Fed raises interest rates.

In March 2015 Germany's stock market index DAX (performance index) broke the historic 12,000-point barrier for the first time. Although the market has now returned to a lower level due to uncertainty regarding the Greek rescue pack-

FIGURE 14

Financial Stress Indicator for Germany

January 1991 - June 2015



Based on 28 mainly non-stationary time series, the principal component is determined by means of a static factor analysis. The principal component describes the largest part of the variations of all time series after trend growth adjustment. Peaks of the factor characterize financial market crises, whereas a stress situation is roughly reached when the factor exceeds a value larger than 1. The underlying information matrix includes data about credit growth, the volatility of equity and commodity prices, rates of credit default swaps, as well as ECB specific information, such as deposit and marginal lending facility and TARGET balances.

Sources: Macrobond; own calculations.

age and as a result of lower growth in emerging economies, the IMK generally sees potential for harmful share price corrections whenever there are jumps in price as for instance between autumn 2014 and spring 2015. In spite of the measures introduced since the financial market crisis, this could represent a threat to financial stability.²⁶ Although the fundamental value of shares cannot be measured precisely, the key figures presented on pages 11 and 12 do provide indications of when prices are approaching the limits of a range which is fundamentally justified and therefore economically sensible. Share prices may continue to rise as a result of the low-interest environment, the herd behaviour inherent in the stock market, or irrational expectations (Campbell, 1999); however, from the point of view

of sustainable economic development it would then be a misallocation of capital if these share price increases were not based on an improvement in the anticipated returns on investments in the real economy. Only then would the increased profitability of corporate assets justify a positive revaluation of corporate assets or, more precisely, of the equity represented in the shares.

However much the ECB's QE policy can be justified in that it counters the damaging effects of the long-term failure of the inflation rate to reach the inflation target, it is equally necessary to set a course during the upswing in asset prices to ensure that the next downturn does not affect those actors in the financial market who are not able to cope with a significant devaluation of their assets. This includes households

who lack a longer-term investment horizon and who should not enter an overvalued market. In the light of concern for macroeconomic stability, the main focus in the euro area is on institutional investors – with particular focus in the current market environment on investment funds which could constitute a systemic risk if falling share prices lead to losses and, consequently, rapid outflows. Possible causes of financial market instability are not restricted to the stock market, however, as the example of the investment funds and the insurance companies shows. The latter now hold a comparatively high indirect share of corporate bonds, some of which are of low investment grade, through special funds (Bundesbank 2013; Bundesbank 2014a).

In contrast to the growing risk appetite in the non-bank sector, as described in the positions of investment funds, insurers and pension funds, German banks have not yet responded to the low-interest environment with increased risk-taking. This development is substantially due to regulatory tightening following the financial market crisis. It therefore appears all the more important to include those areas in which hardly any or insufficient regulatory steps have been taken to date. Solvency II may be an important step in the right direction for the insurance industry. On the basis of our analysis on pages 16-19, however, neither the derivatives market nor the investment funds have yet been subjected to sufficient regulation.

UNCERTAINTY CONTINUES

The primary objective of the ECB's QE policy is to maintain price stability. The transmission channel is based on falling long-term interest rates, which are intended to have a positive effect on investments, growth and, ultimately, on inflation. In view of the fact that part of the private sector in the euro area is still in the deleveraging phase, however, it is highly probable that credit demand is acting as the restricting factor. This in

turn influences the degree to which the portfolio effect of QE can lead to increased lending and ultimately to increased investment activity, especially in view of the fact that interest rates were already low beforehand.

To sum up, there are many indicators that point to a continuing high level of uncertainty on the part of investors. And the risks connected with QE should be regarded as secondary to the hoped-for effects for economic recovery in the euro area. Investors are reluctant to take on higher risk and are transferring only limited funds – mostly through investment-funds – into risky assets. The downside of such behaviour is that too little is being invested in the real economy. Therefore, QE is only having a limited effect there. As far as monetary policy is concerned, it will have to continue its extremely expansionary course until the inflation target appears to be achievable again, not least in order to avoid further strain on the real debt burden of some eurozone countries.

At the same time, this has to be accompanied by strong growth stimulus on the fiscal policy side. If fiscal policy were to provide stronger support, it would be possible to return to a normal interest rate environment (exit strategy) sooner. That would probably reduce both the challenges for macroprudential regulation, being as it is still in the development phase, and the risks inherent in interest rate changes following a sustained period of low rates. Above all, it would reduce uncertainty among investors.

NOTES

- 1 With regard to the distributional effect, it is widely discussed that high-income households profit from the immediate effects, such as the rise in asset prices, whereas the measures only benefit lower-income households if monetary policy succeeds in achieving a higher growth and inflation path. As a rule, the minimum data availability lag for income inequality measures is one year.
- 2 Government bond spreads in the euro area excluding Greece had already narrowed – since ECB President Draghi’s “whatever it takes” speech in July 2012. Beyond the confidence channel, QE can only contribute further to long-term interest rate convergence if government bonds are purchased selectively.
- 3 In principle, a similar effect can be derived based on the liability side.
- 4 In real terms, against the currencies of 38 trading partners and measured by the consumer price index, the devaluation of the euro between December 2014 and July 2015 was 7.7 %.
- 5 Claeys and Darvas (2015b, p. 4) estimate the total balance sheet assets of the financial sector at some 62 billion euros.
- 6 The most important instruments are active control of risk weighting and maximum (property) loan values, as well as activation of anti-cyclical and systemically important capital buffers.
- 7 The financial cycle is generally understood to mean the interplay of credit and asset price cycles.
- 8 Fundamental pricing, such as the present value of future net earnings (rent income or rent saved minus the costs for building and maintenance of the property) is subject to high calculatory uncertainty with regard to the equilibrium real interest rate, inflation and the elasticity of property supply (Joebges et al., 2015). No attempt is therefore made here, in contrast to share prices, to work out a possible overvaluation on the basis of more detailed key figures.
- 9 Share price movements in the USA in particular are a key driver of the MSCI World Index.
- 10 According to the Tobin Separation, the optimally risky portfolio can be determined independently of the investor’s degree of risk aversion. It is assumed here that the DAX index itself represents this market portfolio. The term risk in the CAPM reflects the correlation between the return of an individual share and that of the market portfolio. As a result of diversification, the market portfolio has the least risk among all risky investments.
- 11 The greatest easing can be seen in Italy, however; lending standards were also tightened most severely here in 2011/2012.
- 12 Nine of the total of 25 banks for which capital gaps were identified by the European Banking Authority during the Asset Quality Review are domiciled in Italy. Among them were several institutions that were unable to plug the gaps by the end of the comprehensive assessment procedure.
- 13 The volume of loans requiring adjustment account for over 15 % and approximately 10 % of total lending volume in Italy and Spain respectively. Value adjustments totaling approx. 45 % and 60 % of the credit volume involved in Italy and Spain respectively weigh upon the corresponding banks’ balance sheets. While the volume of non-performing loans in absolute terms is gradually decreasing in Spain, in Italy it only reached a provisional peak in 2014.
- 14 A high share of euro area government bonds denominated in euros does not present an increased risk per se. However, institutional changes since 2010 have called in question the role of government bonds as safe assets. These include the haircut in Greece, the inclusion of collective action clauses with government bonds newly issued by eurozone countries and recent attempts by bank regulators to categorise government bonds as risky securities. Consequences in terms of financial market instability in the euro area resulting from the erosion of the safe asset quality of government bonds are discussed by Tober (2014).
- 15 In the literature, leverage ratio is also defined as the inverse ratio of total assets to core capital.
- 16 Derivatives are essentially reciprocal contracts which as a rule determine the exchange of partly future cash flows and whose economic value is

derived from the development of an underlying asset. Prior to the most recent financial market crisis, the volume of credit derivatives rose in different ways: on the one hand, loans were increasingly transferred into special-purpose vehicles where they were repackaged, so that these loan packages could then be sold (in tranches) to investors (as securitised loans); on the other hand, there was also increased issuance and trading of credit default swaps.

- 17 After the collapse of Lehman Brothers, bank bonds, among them many floating rate notes (FRNs) in which money market funds had invested, came under pressure. As a result of the general turmoil in the money markets, money market funds were faced with outflows which caused them to realise revaluation losses on FRNs.
- 18 As was already the case when Basel II was introduced for banks, criticism is leveled particularly against the assumption of (log-) normally distributed individual risks and the assumption in the aggregation of unconsidered non-linear dependencies.
- 19 As already pointed out, the unconventional monetary policy measures should be seen in the context of the low interest environment. Such measures are normally introduced when interest rate policy reaches the zero lower bound. To that extent, the ending of QE usually heralds the return to a normal interest rate environment, even though the time span between the two monetary policy measures may be considerable.
- 20 The statement refers to the difference between the 10-year point of the yield curve (Svensson Method, German government securities) and a three-month money market rate.
- 21 Accordingly, there is a need for an improvement in municipal income from the Federal government, which IMK has already pointed out in connection with public investments (Rietzler, 2014).
- 22 For example, if property prices fall, it may prove to be impossible to realise the collateralisation values. If share prices fall, so too does commission income and write-downs are needed. The former would affect mortgage banks; the latter the major private banks.
- 23 With regard to the valuation of the securities, this means that they can be carried in the balance sheet at original cost, as a rule corresponding to their nominal value, until maturity, without the need for write-downs in the event of a rise in interest rates in the meantime.
- 24 Important references for constructing the indicator were van Roye (2011) and the Bundesbank (2013, p. 11).
- 25 Mian et al. (2013) estimate very high consumption elasticity in property prices for the USA in comparison with Europe. Even though the data set refers to the pre-crisis period, it can be assumed that values for the Anglo-Saxon countries are still higher. Housing equity withdrawals for consumer spending tend to be less common in continental Europe, for example.
- 26 In such a market environment there is great sensitivity to external shocks, as the reaction of share prices to the slight devaluation of the Chinese currency showed.

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