

The Future of the Euro Area



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Making the Euro Area Fit for the Future

by Ferdinand Fichtner, Marcel Fratzscher, Maximilian Podstawski, and Dirk Ulbricht

The crisis in the European currency area is not yet over. Although the situation in the financial markets is currently relatively calm, the economic crisis appears to be bottoming out in most countries. Nevertheless, there are still fundamental design flaws in the Monetary Union. If these are not fully addressed, it will only be a matter of time before a new crisis hits, and a partial or complete breakup of the Monetary Union cannot be ruled out. The economic consequences would be devastating, not least for Germany. To ensure the survival of the European Monetary Union, fundamental reform is required in three problem areas: the financial markets, public finances, and the real economy. In order to give the Monetary Union a stable foundation, all problem areas must be tackled equally; otherwise, due to interactions between these fields, success in one area might be canceled out by a flare-up of the crisis elsewhere.

The present article outlines the elements of such a strategy for the institutional restructuring of the Monetary Union. Other articles in this and the next issue of DIW Economic Bulletin focus on the role of the ECB as the lender of last resort, the banking union and bank regulation, Community bonds, a European investment agenda, migration within the EU, a European unemployment insurance scheme, options for fiscal devaluation, and mechanisms for sovereign bankruptcies.

The euro area is showing signs of gradual economic recovery. However, we should not allow the brighter outlook to disguise the fact that the crisis is not yet over. The situation has definitely improved significantly and the financial markets, too, are more reassured; Ireland and Spain left the European Stability Mechanism (ESM) at the beginning of the year and Portugal soon followed suit. It is likely that the stabilization funds established in recent years and the announcement by the European Central Bank (ECB) that it would intervene to stabilize the financial markets if necessary and under strict conditions has contributed to these positive developments. However, these steps only served to buy time since the root causes of the crisis remain unresolved.

The euro area crisis was rooted in undesirable developments in three problem areas: the banking system, public finances, and the real economy. The crisis became critical primarily because the negative developments in all three areas were mutually reinforcing, which, in turn, triggered a spiral of uncertainty. This is why the resources earmarked for the stabilization of the banking sector in some member states caused government debt to skyrocket. Conversely, in some countries, government bonds lost value as a result of unsustainable growth in debt, which led to imbalances in the banking system. The austerity measures implemented to consolidate debt in some member states placed an enormous burden on the real economy, while the weak economy resulted in a loss of tax revenues, higher welfare spending, and consequently an increase in public budget deficits. As a result of the banking crisis, corporate lending ground to a halt, which led to a decline in investment activity and, in turn, weakened growth. Conversely, weak economic development and plummeting real estate prices ultimately inflated loan defaults to banks and caused credit portfolios to deteriorate. This precipitated a vicious circle in the crisis countries¹ which remains unbroken to this

¹ For a detailed description of the vicious circle of bank debt, sovereign debt, and the macroeconomic crisis, see J. C. Shambaugh, *The Euro's Three*

Box

Abolishing the Euro Would Have Unpredictably High Costs for Germany

It is impossible to put a realistic figure on the cost to Germany of the euro collapsing. What is certain, however, is that it would be a considerable sum. Even an orderly exit from the euro would still see Germany faced with substantial costs, for example, due to the loss of receivables, the appreciation of the deutschmark, exchange rate fluctuations, a weakening of export business, and an increase in unemployment. In the event of a disorderly collapse of the euro area, the cost implications would be even greater.

If each of the individual euro member states were to introduce its own currency, it is highly likely that the new deutschmark would be used by the other countries, not only in the euro area but in the EU, as a reserve currency. Consequently, there would be an appreciation of the deutschmark against the remaining European currencies which, in turn, would reduce Germany's competitiveness. The possible impact on trade mainly depends on the degree of appreciation.¹

As well as the appreciation costs of the deutschmark, there would also be transaction costs from holding foreign currency accounts and buying and selling foreign currency, for example. Exchange rate fluctuations would increase the risks of cross-border trade in goods and services. Further, the price transparency that currently exists across the euro area would be lost, which would have a negative impact on competition.² The slump in trade could be substantial. Baldwin et al. have estimated that the introduction of the common currency led

to an increase in trade within the euro area of between five and ten percent.³

Transferring receivables and liabilities to the respective successor currencies could lead to balance sheet imbalances for both companies and banks. If liabilities denominated in deutschmarks were offset by receivables denominated in another, weaker currency, this would result in a need for recapitalization. Depending on the degree of appreciation, this could trigger corporate collapses and a banking crisis which, in turn, would necessitate extensive government bailout packages and would burden public budgets.

Even the withdrawal of a small country like Greece from the euro would give the markets the sense that the departure of other countries was more likely. This could lead to a domino-like collapse of the entire euro area.⁴ The other crisis countries in the euro area such as Portugal or Italy could be faced with capital flight and possibly bank runs. The ECB payment mechanism would collapse which, in turn, could result in corporate bankruptcies and a slump in investment activity. The refinancing costs for the crisis countries would increase and their public revenue would decline. Ultimately, other countries could be forced to leave the euro in order to avert national insolvency by implementing an expansive national monetary policy. Important trading partners would slide into recession.

It is doubtful that the EU would survive the failure of the euro. If the EU were also to collapse, the benefits of free movement

¹ Due to the different circumstances, the dissolution of other currency unions such as the Soviet Union, Czechoslovakia, or Yugoslavia can only be used for a very limited comparison.

² For a more detailed account of the pros and cons of monetary integration, see also F. Fichtner, *Optimum Currency Area Theory Revisited – New Insights from Stochastic Dynamics* (Aachen: 2008).

³ R. E. Baldwin, J. A. Frankel, and J. Melitz, "The euro's trade effects," ECB Working Paper, no. 0594 (2006).

⁴ A. Åslund, "Why a Breakup of the Euro Area Must Be Avoided: Lessons from Previous Breakups," Policy Brief, no. 12-20 (Peterson Institute for International Economics, 2012).

day. If the situation in any one of the three problem areas were to deteriorate again, due to the reciprocal effects outlined above, the crisis would become critical again.

The possibility of individual member states leaving the Monetary Union or of the euro area dividing—into a

northern and southern euro—are frequent topics of discussion.² However, what is often overlooked is that the dissolution of the euro area would have significant cost implications that are likely to far exceed the anticipated benefits. This not only applies to the crisis countries but also to the more stable economies such as Ger-

Crises (2012), www.brookings.edu/~media/Projects/BPEA/Spring%202012/2012a_Shambaugh.pdf, and Council of Experts (Sachverständigenrat), *Nach dem EU-Gipfel: Zeit für langfristige Lösungen nutzen*, Special Report, July 5, 2012.

² See for example, H.-O. Henkel, *Rettet unser Geld – Wie der Euro-Betrug unseren Wohlstand gefährdet* (Heyne Verlag: 2010); D. Meyer, "Stabilität durch Nord-Süd-Teilung der Währungsunion," *Orientierungen zur Wirtschafts- und Gesellschaftspolitik* 4 (2011): 19–21.

of people, goods, services, and capital would be lost too. Citizens would no longer be able to work and companies would no longer be able to operate unhindered in neighboring countries. Customs duties and different legal systems would put a strain on the trade in goods.

Quantifying the cost to Germany of abolishing the euro is subject to considerable uncertainty. At best, a number can be put on the maximum liability based on TARGET balances and receivables accrued during the implementation of rescue packages; in the event of a dissolution of the European Monetary Union and insolvency of the GIPSIZ states,⁵ this sum would amount to approximately 400 billion euros or 14.5 percent of Germany's GDP.⁶

Two major banks have attempted to quantify the additional costs. In their calculations, both ING⁷ and UBS⁸ assume that national currencies would be reintroduced in an ordered and systematic fashion. The ING calculation is based on the entire euro area collapsing but, at the same time, the EU continuing to exist. Based on this assumption, the estimate puts the financial loss for Germany at approximately 12 percent of the

country's GDP in the first two years.⁹ UBS, on the other hand, has analyzed the impact of Germany withdrawing from the euro and the EU.¹⁰ In this calculation, it is assumed that no other countries leave the euro area as a result of Germany's departure. The UBS estimates costs for Germany of 20 to 25 percent in the first year. Unlike ING's estimate, in addition to one-off costs, the UBS calculation also assumes continuing losses for the following year at ten to 15 percent of Germany's GDP.¹¹

However, both of these studies simulate very specific scenarios and are dependent on the underlying assumptions. Particularly the assumptions underpinning both studies that there is consensus among all countries and that the transition is smooth are very restrictive. Further, estimates on the development of key factors such as exchange rates are fraught with uncertainty.

⁵ Greece, Ireland, Portugal, Spain, Italy, and Cyprus.

⁶ www.cesifo-group.de/de/ifoHome/policy/Haftungspegel.html, accessed on May 7, 2014. The Ifo Institute calculates Germany's existing liability as the sum of outstanding receivables to the Bundesbank resulting from the European Central Bank's payment system (TARGET2 balances), financial assistance paid out to the crisis countries, Germany's share of government bond purchases, and the balance of receivables from issuing the banknotes.

⁷ M. Cliffe, "EMU Break-Up: Pay Now, Pay Later," ING Financial Markets Research (December 1, 2011).

⁸ UBS, "Euro breakup – the consequences," UBS Investment Research – Global Economic Perspectives (2011). This study also analyzes the exit from the euro of an economically-weak country such as Greece but does not quantify the costs for Germany.

⁹ The study actually refers to a three-year period but the first year only includes December 2011 which is the date of the notional collapse of the euro area.

¹⁰ If only Germany were to leave the euro area, the inevitable consequence would also be its departure from the EU. See P. Athanassiou, "Withdrawal and expulsion from the EU and EMU: Some reflections," Legal Working Paper Series (ECB, 2009).

¹¹ UBS estimates the total one-off costs at between 6,000 and 8,000 euros per capita and permanent costs of between 3,500 and 4,500 euros. The percentage shares of GDP are based on the GDP of the study's year of publication.

many (see box). The political fall-out from a collapse of the Monetary Union—and the accompanying dramatic impact on the progress of the European integration process—also mean that ensuring the survival of the common currency must be given the highest priority.

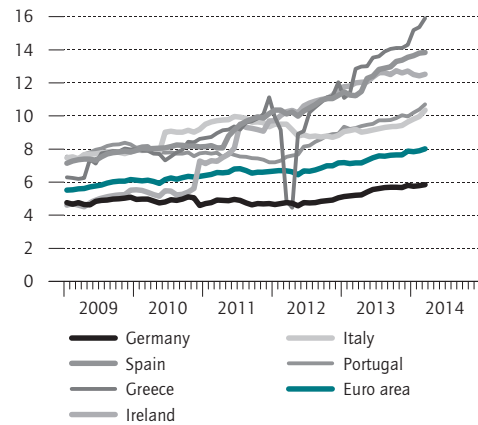
Some institutional reforms have already been implemented in recent years, but they are not enough. With the introduction of joint banking regulation and the harmonization and centralization of resolution procedures, some important structural components of a new finan-

cial market system have been put in place. However, more comprehensive integration is required in order to sever the connection between public finances and the problems of the banking system. Reforms to the Stab-

Figure 1

Leverage Ratio

In percent



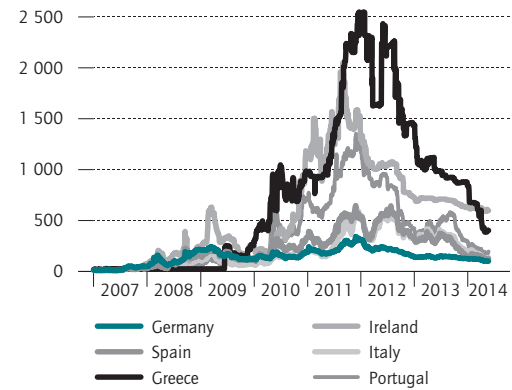
Source: ECB.

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The banking sector's debt level has declined considerably since the crisis and equity capital ratios are on the rise.

Figure 2

Credit Default Swaps in the Banking Sector



Source: Datastream.

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European banks' default premiums continue to converge.

ity and Growth Pact³ and the Fiscal Pact⁴ implemented as part of fiscal policy could contribute to improving the sustainability of public finances in the euro area; in the medium term, however, there needs to be far more coordination of budgetary policies in order to prevent undesirable developments. There is also room for improvement as far as the coordination of economic policy is concerned. The procedure for preventing macroeconomic imbalances⁵ and the European Semester⁶ are two instruments that have already been created to coordinate economic policy in the euro area. However, other stabilization mechanisms—such as dismantling migration barriers to promote mobility between countries with higher and lower unemployment—have, thus far, only been utilized to a limited extent.

Financial Markets: Preventing Systemic Crises

Both the European banking sector and the financial markets in the euro area appear to have stabilized. To a great extent, this is a result of the ECB implementing unconventional monetary policy measures, including longer-term refinancing operations⁷ (LTRO)⁸ and Outright Monetary Transaction⁹ (OMT) programs, which ended the spiral of rising interest rates and negative expectations.

Further, prompted by increased regulatory pressure, banks have also begun to consolidate their balance sheets. Thus, the debt-to-equity or leverage ratio¹⁰ in the euro area has increased from an average of 5.5 percent in 2008 to approximately eight percent today (see

³ In March 2011, a tightening of the Stability and Growth Pact was agreed which prescribed stricter sanctions and required the European Council to provide justification if no sanction process were implemented in the event of an infringement.

⁴ The European Fiscal Pact, which was adopted in December 2011, stipulates automatic sanctions for member states of the euro area should they violate any of the financial policy regulations contained in the Maastricht Treaty.

⁵ The aim of the Macroeconomic Imbalance Procedure (MIP), which was adopted in December 2011, is to help recognize potential risk developments such as significant current account imbalances, house price bubbles, or high public debt in good time and to counteract them.

⁶ The European Semester, which was adopted in December 2011, requires an assessment of national governments' economic and fiscal policy programs to be implemented before they are adopted by member states.

⁷ In December 2011, as well as introducing *main refinancing operations* (MRO) with a one-week maturity, the ECB also launched its longer-term refinancing operations (LTRO) with a maturity of up to three years. Unlike the main refinancing operations, the purpose of this instrument is not to control short-term interest rates but to provide the finance sector with liquidity.

⁸ D. G. M. Lenza, H. Pill, and L. Reichlin, "The ECB and the interbank market," ECB Working Paper Series, no. 1496 (2012).

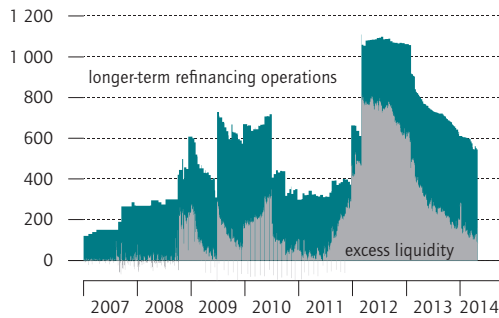
⁹ The Outright Monetary Transactions (OMT) program, introduced by the ECB in September 2012, allows the Eurosystem to purchase the government bonds of member countries in the secondary market. The aim of the program is to reduce governments' refinancing costs.

¹⁰ The *leverage ratio* is a measure of debt levels of the banking sector and is calculated as the ratio of equity capital to non-risk-weighted total assets. For more details about the advantages of a non-risk-weighted measuring system such as the *leverage ratio*, see D. Schäfer, "Banken: Leverage Ratio ist das bessere Risikomaß," DIW Wochenbericht, no. 46 (2011).

Figure 3

Longer-Term Refinancing Operations and Excess Liquidity

In billions of euros



Source: ECB; calculations by DIW Berlin.

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The ECB significantly reduced excess liquidity in the recent refinancing of the banks.

Figure 1). This indicates a certain amount of deleveraging in the banking sector. Also, measured against capital adequacy requirements, it is evident that the situation has improved: very few banks remain below the (currently specified) weighted core capital ratio. Similarly, aggregated credit risk in the euro area's banking sectors has also declined across the board (see Figure 2).

A good indication that confidence has been restored in the interbank market is the early repayment of a significant portion of the ECB's longer-term refinancing operations with a maturity of three years from 2013, which has led to a rapid reduction in banks' excess liquidity (see Figure 3). Money market interest rates have developed in a similarly positive direction, particularly the normalization of risk premiums on the interbank market (see Figure 4).¹¹

However, the steady rise in the share of loans at risk of default on banks' balance sheets has muddied the waters somewhat and is evidence of the latent risks that remain in the banking sector (see Figure 5).

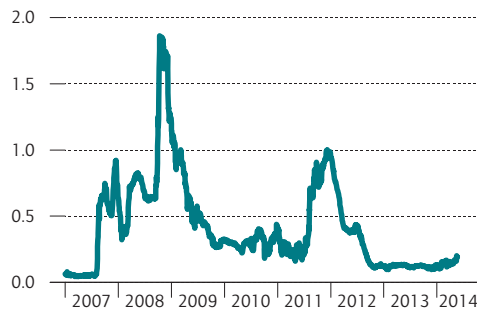
The stress tests currently being conducted by the European Banking Authority (EBA) and the ECB, which use significantly more stringent criteria than similar tests

¹¹ The EURIBOR is the rate at which liquidity is lent on the interbank market at fixed maturities, whereas the EONIA swap rate is the effective overnight interest rate on the interbank market. Since the maturities are not the same, the difference between the two rates is considered a measure of the interbank market risk premium.

Figure 4

Interbank Market Risk Premium

In percent



Source: Datastream.

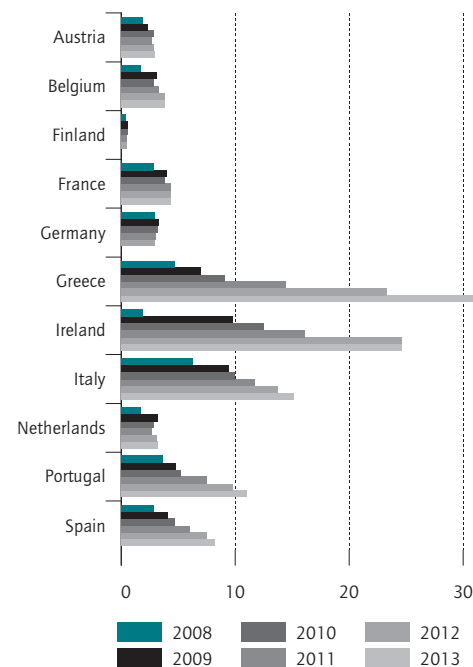
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The risk premium has almost been at its pre-crisis level for more than a year now.

Figure 5

Non-Performing Loans

In percent



Source: World Bank.

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The share of non-performing loans has been increasing steadily since 2008.

conducted in the past, enable us to take a closer look at the stability of the euro area's largest banks. Regardless of the results of the stress tests, the recently adopted recovery and resolution mechanism for ailing banks must first prove itself in practice. The shadow banking sector also remains under-regulated. If appropriate regulations are not implemented, the risks will shift from regulated business segments to the unregulated sector.

European policy has already made significant progress toward a more stable integration of the financial markets by creating a joint banking regulatory authority and harmonizing and centralizing resolution processes. It is questionable, however, whether these new institutional mechanisms are actually robust enough to resolve large failing banks. The main danger is that the size of the planned resolution fund (around 55 billion euros) would not suffice in the event of a systemic banking crisis, in which case financial institutions would have to be shored up by the individual member states again. Further reforms are therefore necessary to completely break the vicious circle between banks and governments. There is also still room for improvement of the regulatory reforms implemented in recent years, such as Basel III¹² or macroprudential regulation, which is discussed in detail in the separate article on the banking union and bank regulation in this issue of DIW Economic Bulletin.¹³

The further development of the banking union is likely to improve the stability of the European banking system. Nonetheless, future banking crises in the euro area and therefore new downward spirals of liquidity issues, credit crunches, deteriorating public finances, and weak real economic development can certainly not be ruled out. One of the main problems during the crisis was the shortage of safe bonds, primarily due to government solvency problems, that could have been used as collateral for securing loans on the European financial markets. It would therefore make sense to generate safe bonds in the euro area to fulfil this purpose in the event of future crises. Suitable instruments have already been proposed which function entirely without joint liability.¹⁴ Suitable types of Eurobond should also be impartially reconsidered as long as they are not used for the "communitarization" of sovereign debt but rather to create liquid markets. The separate article on Com-

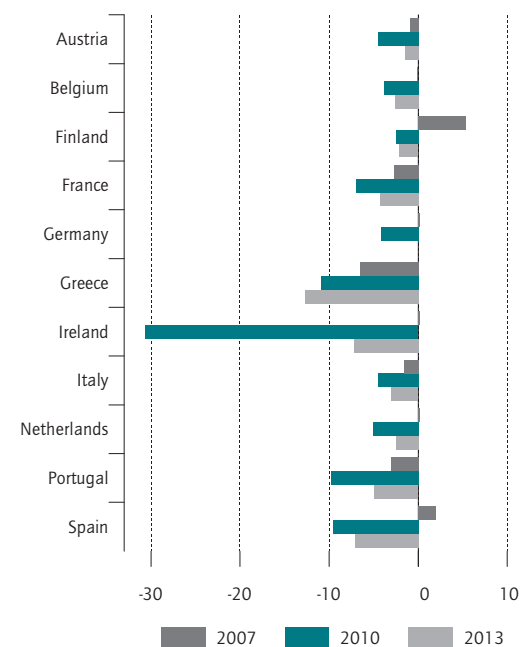
¹² Basel III is a banking regulation reform package published by the Basel Committee on Banking Supervision at the Bank for International Settlements at the end of 2010. See DIW glossary: Basel III, www.diw.de/de/diw_01.c.413274.de/presse/diw_glossar/basel_iii.html.

¹³ An overview of all articles to be published as part of this series can be found at the end of this report.

¹⁴ Brunnermeier et al. European Safe Bonds: ESBies, www.euro-nomics.com (2011)

Figure 6

Public Budget Deficit As percentage of GDP



Source: Eurostat.

© DIW Berlin

The average weighted public budget deficit in the euro area has reached almost three percent again.

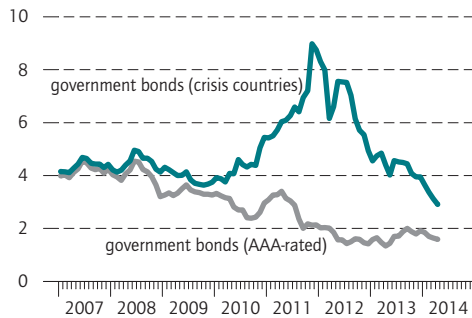
munity bonds in the present DIW Economic Bulletin series outlines the various possible instruments of this type and discusses the pros and cons.

Further, the role of the European Central Bank as the "lender of last resort" also needs to be strengthened. As with central banks around the world, the ECB should have access to explicit fiscal backing that enables it to fulfil its mandate of securing price stability regardless of losses incurred during its operations. Additionally, the role of the European Stability Mechanism (ESM) as a lender of last resort for governments should be strengthened as well. To date, with the announcement of its OMT program, the ECB has undertaken this task. However, the German constitutional court case against the OMT has shown how controversial the ECB's role and the clear definition of its mandate can be. The ECB and ESM's tasks and mandate must therefore be defined more precisely, ideally by way of supplements to the relevant treaties. The prohibition on monetary government financing (Article 123 of the Treaty on the Functioning of the European Union, TFEU) must be confirmed and strengthened. At the same time, the ECB's fiscal backing must be explicitly established. Otherwise, the ECB

Figure 7

Capital Market Interest

In percent



Source: Datastream.

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The interest on government bonds in the crisis countries has fallen to almost the same level as countries with a better credit rating.

runs the risk of not being able to react credibly enough in future crisis situations to fulfil its mandate of maintaining price stability. The separate article on the ECB as the lender of last resort in the present DIW Economic Bulletin discusses this subject in detail.

Public Finances: Ensuring Sound Budgetary Policies

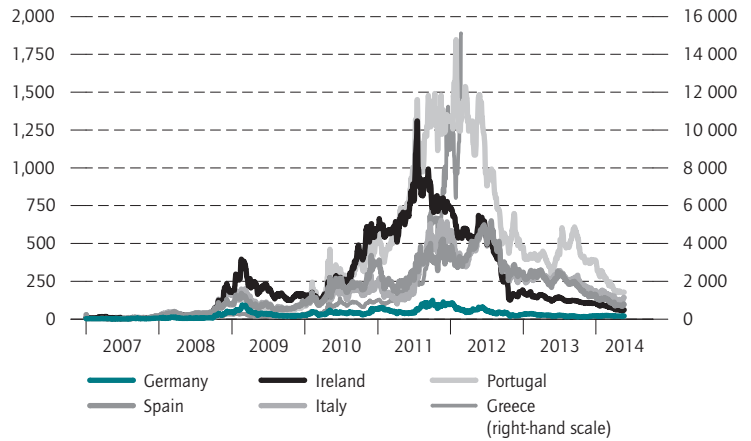
Public sector debt levels remain high in many of the Monetary Union's economies. Nevertheless, efforts to consolidate them are having some effect: the average public budget deficit in the euro area decreased from 3.7 percent of GDP in 2012 to 3.1 percent in 2013—although there is substantial regional variance (see Figure 6). At the same time, the financing conditions for the crisis countries have been relaxed considerably. Current secondary market yields in Spain, Italy, Portugal, Greece, and Ireland are around three percent, which is not even half the peak level reached during the sovereign debt crisis (see Figure 7). The development of credit default swaps (CDS) also illustrates an easing of the situation on the European government bond markets (see Figure 8).

However, the main reason for this improvement is probably the use of unconventional monetary policy measures, particularly the ECB's OMT program.¹⁵ By announcing

¹⁵ D. Zsolt, "The Euro Crisis: Ten Roots, but Fewer Solutions," Bruegel Policy Contribution 17 (2012): particularly 17.

Figure 8

Government Bond Credit Default Swaps



Source: Datastream.

© DIW Berlin

The markets' default risk rating of government bonds has significantly improved again in the crisis countries.

that it would intervene to create stability on the secondary government bonds market, if necessary and under strict conditions, the ECB successfully eased the markets' uncertainty relating to crisis countries defaulting on their debt repayments. However, the markets' risk assessment is unlikely to stand up to an objective evaluation of its framework conditions; a sustainable solution for the problems on the markets for government bonds thus remains elusive.

Despite the fact that deficits have been significantly reduced in some countries, public debt levels have increased again and continue to limit scope for fiscal maneuver in the Monetary Union (see Figure 9); it is likely that this would become all the more important should financing conditions deteriorate again and the interest burden increase.¹⁶ In addition, the low inflation rate in the Monetary Union (currently around one percent) only makes a marginal contribution to reducing the debt burden.¹⁷

Further, the danger that member states of the Monetary Union will again experience unsustainable debt developments in the future has not yet been averted. In

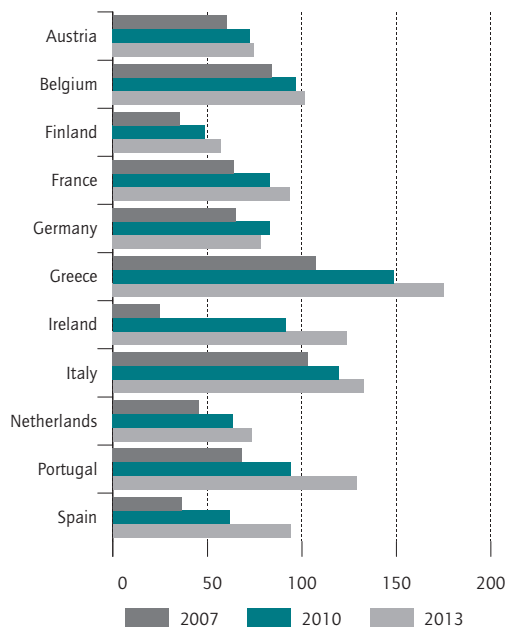
¹⁶ M. Krokert, D. Schäfer, and A. Stephan, "Mit niedrigen Zinsen aus der Schuldenfalle," DIW Wochenbericht, no. 7 (2014): 115-126.

¹⁷ K. Bernoth, M. Fratzscher, and P. König, "Weak Inflation and Threat of Deflation in the Euro Area: Limits of Conventional Monetary Policy," DIW Economic Bulletin, no. 5 (2014).

Figure 9

Sovereign Debt

As percentage of GDP



Source: Eurostat.

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Despite falling deficits, sovereign debt is continuing to climb.

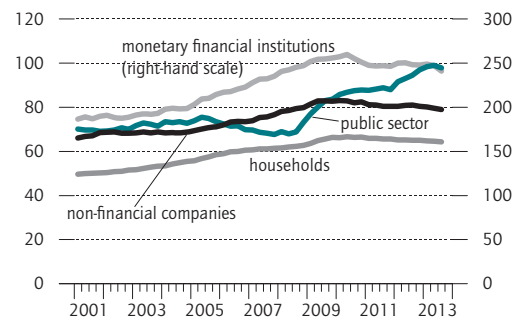
the past, it has not been possible to persuade national governments to follow responsible spending and debt policies, whether by way of regulation or market incentives. Therefore, the previous version of the Stability and Growth Pact did not meet expectations. The disciplining effect of the financial markets also had limited impact since creditors barely differentiated between member states of the Monetary Union when they were fixing interest rates—probably also because the Maastricht Treaty's no-bailout clause was not credible.

To achieve sustainable fiscal policies, regulations tying fiscal policy with the reforms of the Stability and Growth Pact and the anchoring of debt brakes in national legislation of member states (fiscal pact) have been strengthened in recent years; it remains to be seen whether the new regulations—such as possible sanctions for infringements—will be rigorously implemented, however. Unfortunately experience of the old Stability and Growth Pact casts doubt on that supposition. This applies all the more given that, to date, no provisions have been made to curb excessive debt policy more effectively using market-based sanction mechanisms. The financial markets in particular have no real reason to view the no-bailout clause as significantly more

Figure 10

Debt Levels

As percentage of GDP



Sources: EEA/ECB, taken from P. Cour-Thimann and B. Winkler, "The ECB's non-standard monetary policy measures: the role of institutional factors and financial structure," *Oxford Review of Economic Policy*, 28 (4) (2013): 765–803 and updated.

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Recently, debt levels in the private sector have been slightly lower.

credible than before the crisis. On the one hand, experience in Greece and Cyprus has shown that European government bonds cannot always be seen as default risk-free. In addition, international financial institutions increasingly perceive preventative bail-ins as a legitimate instrument during debt crises.¹⁸ On the other hand, the stabilization funds established in recent years and the bond program announced by the ECB have tended to heighten the expectation that, in the event of individual member states running into financial difficulties, debt default is only likely to occur in exceptional circumstances. Consequently, the debt development of individual member states will probably only have a marginal impact on risk premiums in the future, thus rendering their disciplining effect inadequate. This is only likely to change if debt default becomes a credible prospect in the euro area. As the separate report in this series on mechanisms for state insolvency demonstrates, the option of controlled debt reduction as part of an insolvency process for overindebted Monetary Union member states could also make a contribution here; in this context, the much-vaunted introduction of collective action

¹⁸ IMF, *Sovereign Debt Restructuring—Recent Developments and Implications for the Fund's Legal and Policy Framework* (2013), www.imf.org/external/np/pp/eng/2013/042613.pdf.

clauses¹⁹ is only the first step and, moreover, their effectiveness is not without its detractors.²⁰

There is also room for improvement as far as the coordination of fiscal policy in the Monetary Union is concerned. Since monetary policy is not available as a stabilization mechanism in the event of divergent economic developments in the individual member states, and the exchange rate ceases to be an adjustment tool, fiscal policy is a hugely important instrument for stabilizing the Monetary Union's economy. Against this backdrop, the creation of a "fiscal capacity" is currently under discussion, i.e., an instrument that would be managed at European level and used to absorb macroeconomic shocks (Van Rompuy report).²¹ One possible alternative way of ensuring a higher degree of synchronization of economic cycles in the euro area, and thus facilitating a common monetary policy, would be an automatic transfer system, such as a European unemployment insurance scheme.²² The separate report on European unemployment insurance which is part of this publication series analyzes the organization, feasibility, and benefits of such a scheme.

However, one of the key challenges for fiscal policy remains the reduction of public debt which is still very high. For this to happen, economic development requires a solid foundation; strong growth and an associated improvement in public revenues and expenditure are both decisive conditions for a sustainable improvement in public finances.

Real Economy: Unlocking Growth Potential

Economic performance in Europe has experienced a slight upturn since spring 2013 and the protracted recession that had prevailed for over two years appears to have been overcome. However, against a backdrop of

very high unemployment in some countries, the necessary debt consolidation by companies, households, and the public sector continues to mar medium-term growth prospects.

Private debt in the euro area remains very high. Some progress has certainly been made toward reducing debt in non-financial companies and households and the debt ratios have declined slightly since 2008 (see Figure 10). However, particularly in the crisis countries, debt remains considerably higher than indicated by the most commonly used measures of debt sustainability²³ (see Figure 11). Households and companies are likely to be working on reducing their liabilities for some years to come before they reach a sustainable debt level. This will be at the expense of corporate investment and private consumer demand which, in turn, will negatively impact economic growth for the foreseeable future. Another process having a dampening effect in many countries is the correction of the overcapacity that was accumulated in individual sectors (real estate, for example) in the past.

Thus, for some years now, the euro area's economy has been on a much lower growth path than before the crisis. The European Commission has forecast the euro area's potential economic growth for 2013 and 2014 at slightly over half a percent. Factors contributing to this situation include total factor productivity in the euro area, which has been on a downward trend for many years, and the weak growth of investment activity and labor participation resulting from the crisis (see Figure 12).

At 11.7 percent, the unemployment rate in the euro area in April 2014 was still extremely high, with youth unemployment and the increasing duration of unemployment being particular problem areas: almost one in four young people aged 15 to 24 is unemployed and nearly one-third of those looking for work in the crisis countries has been out of a job for more than two years (see Figure 13).

A fundamental prerequisite for creating the new, export-oriented economic sectors that could constitute a sound basis for economic development in the crisis countries will be for those countries to leverage investment capital and attract foreign investment. This is the only way of establishing sufficient production capacity to meet the changed requirements. In the process, it is

¹⁹ Based on Collective Action Clauses, bond issuance terms, as required for a debt haircut, for instance, can be agreed by the majority of creditors which then renders them binding for all bond creditors. Consequently, the restructuring of government debt cannot be blocked by a minority of creditors, for example. For details on the implementation of these clauses in the euro area, see http://europa.eu/efc/sub_committee/cac/index_en.htm.

²⁰ For a critical analysis of CACs see, for example, A. Gelpern and M. Gulati, "The wonder-clause," *Journal of Comparative Economics*, no. 41 (2) (2013): 367-385.

²¹ H. van Rompuy, *Towards a Genuine Economic and Monetary Union* (2012), www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/ec/134069.pdf.

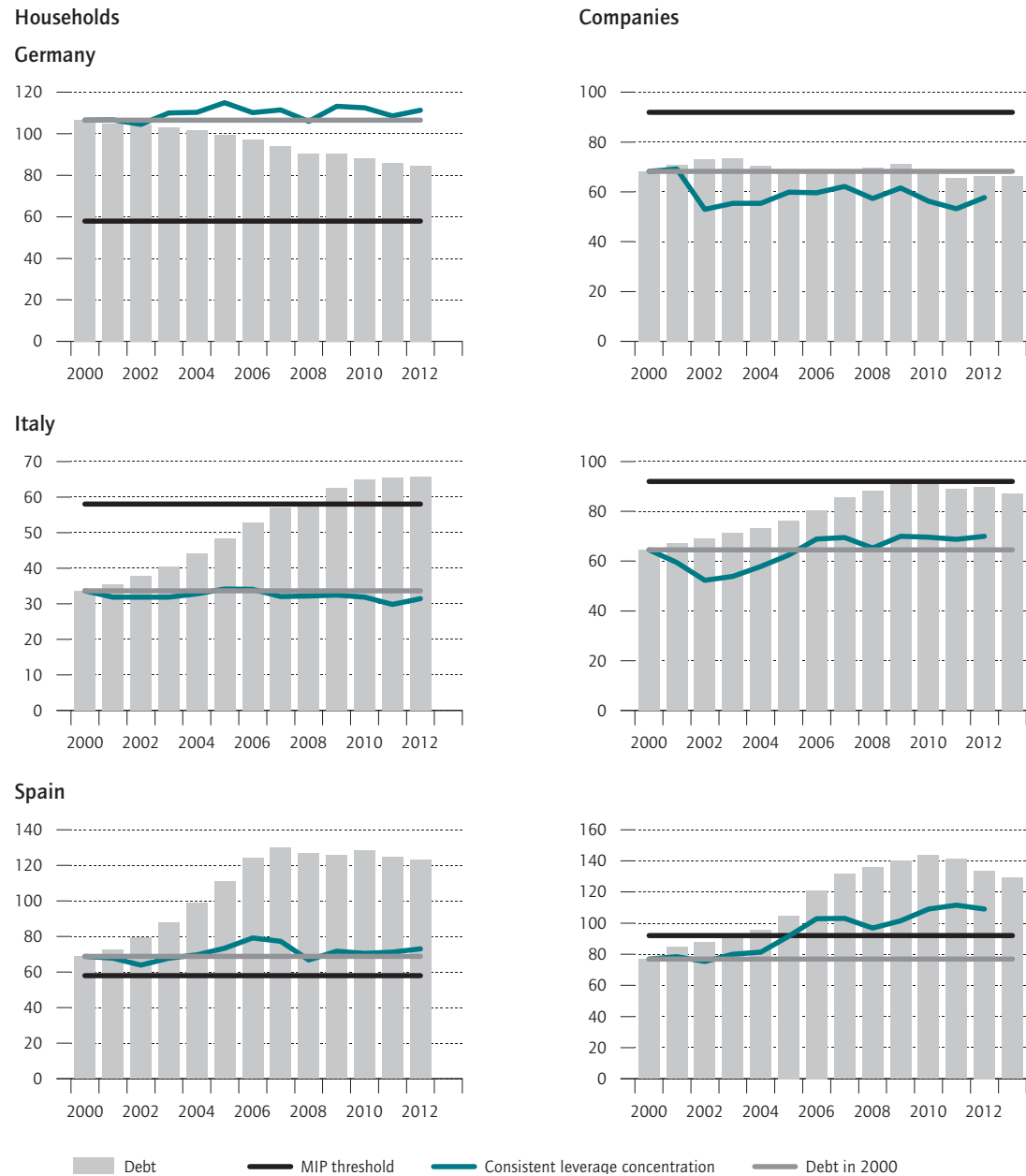
²² On this, see also S. Dullien and F. Fichtner, "Eine gemeinsame Arbeitslosenversicherung für den Euroraum," *DIW Wochenbericht*, no. 44 (2012): 9-15, and, for a more general discussion, K. Bernoth and P. Engler, "A Transfer Mechanism as a Stabilization Tool in the EMU," *DIW Economic Bulletin*, no. 1 (2013): 3-8.

²³ Three conventional threshold values are used here to measure the sustainability of the debt ratio: (1) MIP threshold (threshold according to the criteria of the *Macroeconomic Imbalance Procedure*: debt relative to GDP according to the third quartile of the distribution from 1995 to 2008 for the EU-27), (2) Pre-crisis value (2000), or (3) consistent leverage concentrations, that is, price-adjusted debts develop in parallel with price-adjusted asset values.

Figure 11

Household and Non-Financial Corporate Debt

As percentage of disposable income (households) and percentage of GDP (companies)



Source: Eurostat.

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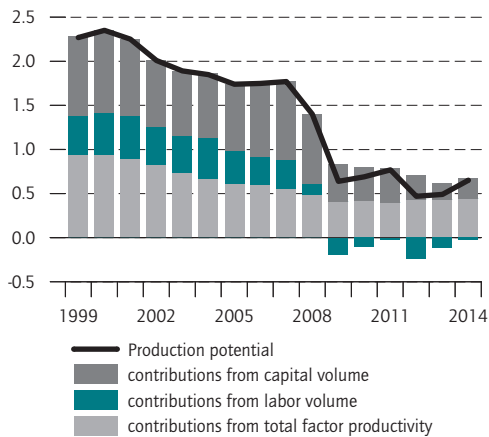
The crisis countries, in particular, have continued to struggle with high debt levels in the private sector.

important to ensure that the inflow of foreign capital is actually spent on investments that will promote growth in the long term rather than repeating the past mistake of investing in branches which had only a short-term positive impact on growth but in the medium term turned

out to be less profitable. The euro area as a whole is also facing a lack of structural investment which is partly linked to the currently high degree of political uncertainty, but also has more deeply-rooted underlying causes. Improvements in financing conditions for investment

Figure 12

Growth Rates of Production Potential in Euro Area In percent



Source: European Commission (CIRCABC).

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Production potential growth in the euro area has been much slower than before the crisis.

are therefore required; possible options to consider include co-financing infrastructure investment with private and public funds and improving financing options for young innovative enterprises. A separate article in this series on investment in Europe outlines specific strategies for increasing production capacity.

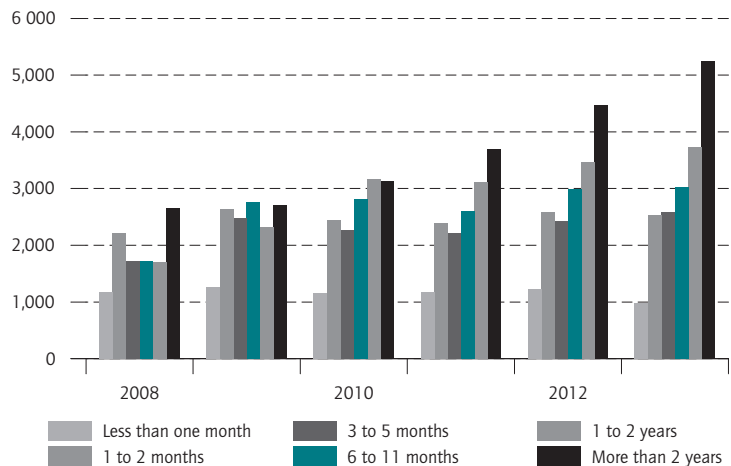
Crisis countries also need to improve their price competitiveness and visible progress has been made in this area in the last few years. For example, in nominal terms, labor costs in many of the crisis countries have barely increased recently compared to other Monetary Union member states, and in some countries they have even decreased significantly (see Figure 14).

One useful way of promoting competitiveness is to restructure the tax system in a revenue-neutral manner, specifically so as to reduce companies' production costs and thus strengthen export activity (fiscal devaluation). This method can also help to counter an increase in future economic imbalances, particularly if corresponding efforts are coordinated across Europe. This proposal is discussed in a separate article on fiscal devaluation as part of this DIW Economic Bulletin series.

The recent increase in mobility within the European Union is one factor which is likely to ease the unemployment situation in the crisis countries somewhat: an in-

Figure 13

Euro Area Unemployment by Duration In 1,000 people



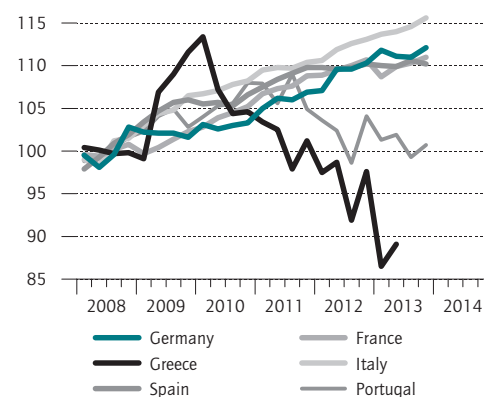
Source: Eurostat.

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The average duration of unemployment has risen sharply.

Figure 14

Nominal Labor Costs Index (2008=100)



Source: Eurostat.

© DIW Berlin

Recently, nominal labor costs in Greece and Portugal have declined significantly.

creasing number of people who have no job prospects in the crisis countries are migrating to countries with more favorable economic and employment conditions (for example, to Germany). In order that this stabilization mechanism—which has been discussed in the lit-

erature for decades²⁴—can have more of an impact on Europe in future, the institutional and informal conditions for cross-border mobility within the EU must be further improved. The individual report on migration within the EU in this issue of DIW Economic Bulletin makes various relevant proposals in this area.

Conclusion and Outlook

Beginning in 2008, a vicious cycle of mutually reinforcing crises in the banking system, public finances, and the real economy led to a deep recession with serious political and social ramifications. This triple crisis pushed the project of the century, European integration, to the brink of collapse.

For the time being, the situation has eased somewhat. Public budget deficits in the crisis countries are approaching the three-percent target again although debt levels are continuing to increase in many places. The financial markets have stabilized although the serious ongoing problems faced by European banks and sovereign budgets are predominantly being masked with monetary policy measures. The recession appears to have been weathered yet unemployment rates remain very high in many euro area countries.

The design flaws in the Monetary Union persist. For example, it is still unclear how to resolve major banks without bringing entire economies to their knees. With regard to fiscal policy, here, too, there are ways of encouraging national governments to follow responsible debt policies that have not yet been pursued; clear rules on debt relief for over-indebted countries would be a step in the right direction. When it comes to tackling unemployment, the opportunities created by the increased mobility of workers have not yet been fully utilized; it is imperative that the institutional and informal conditions for migration are further improved. The biggest challenge in the near future will be to generate growth opportunities in the crisis countries, which, first and foremost, requires available investment capital to be used as efficiently as possible and capital stock to be increased in the long term.

In this and the next issue of DIW Economic Bulletin, DIW Berlin makes a series of proposals on reforming the institutional framework of the European Monetary Union with the aim of making it more resistant to future crises (see table). The policy proposals should not be seen as conclusive; for example, in the area of econom-

ic policy coordination, beyond the proposals made here, more can also be done to consolidate economic development in the member states and thus create a basis for a suitable common monetary policy. With regard to the restructuring of the financial markets, here, too, European and international economic policy-makers need to act.

In order to preserve the European Monetary Union, changes to its institutional framework are long overdue. Policy-makers should take advantage of the current phase of relative calm to implement the appropriate reforms. Otherwise, it is only a matter of time before there is a new crisis and a partial or even complete dissolution of the euro area cannot be ruled out. This would bring devastating economic and political consequences—not least for Germany.

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JEL: E61, E44, H60, G18

Keywords: Euro crisis, Monetary Union, institutional reform, banking crisis, sovereign debt crisis

²⁴ R. Mundell, "A Theory of Optimum Currency Areas," *American Economic Review*, vol. 51(4) (1961): 657-665.



Dr. Ferdinand Fichtner, Head of the Department of Forecasting and Economic Policy at DIW Berlin

SEVEN QUESTIONS TO FERDINAND FICHTNER

»Stabilizing the European Monetary Union: High Time for More Reforms!«

1. Dr. Fichtner, what is the current state of the economy in the euro area? Has the crisis bottomed out? The economic situation in the euro area appears to have stabilized. In the euro area as a whole, we are seeing positive growth rates more or less across the board and, importantly, the economies of the crisis countries are also more stable.
2. Have the root causes of the crisis been resolved now? Although there has been an upturn in economic development, this is just a temporary lull in the crisis. Recently, the financial markets, too, have been calmer. However, this is primarily due to stabilizing interventions by the European Central Bank and the rescue packages.
3. Do the stabilization mechanisms need to be restructured? The stabilizing measures implemented in the past successfully stopped the acute crisis in its tracks. However, these mechanisms will not prevent a recurrence of the same imbalances and problems we experienced before. With this in mind, it is high time for us to take advantage of today's favorable economic circumstances to shape the institutional foundations of the Monetary Union so as to prevent new imbalances and therefore new crises developing, if at all possible.
4. Does the European Monetary Union need a completely new institutional basis? A complete restructuring of the Monetary Union is not necessary but certain essential additional elements are required to stabilize it. Adjustments need to be made in certain key areas in order to secure stability.
5. What structural reforms would be necessary to make the European Monetary Union less vulnerable to crises? The euro crisis is essentially a three-part problem that mani-

fested itself to varying degrees in the financial markets, the real economy, and public finances. The key features, however, were the significant interactions between these three crises. It is essential that we put an end to these reciprocal effects as soon as possible. This is the central tenet of the present issue of DIW Economic Bulletin. It includes, for example, isolating public finances from the situation on the financial markets and also making the real economy less susceptible to public debt.

6. What risks do you think would result from a failure to implement these reforms? If the institutional changes we propose are not implemented, the crisis will continue to endanger the Monetary Union. This could ultimately result in its collapse, which would have massive cost implications for all member states but particularly for Germany. Dissolution of the Monetary Union would also signify the end of the European integration process, thereby laying to rest one of the most politically important projects of the century.
7. How long will it take before we can really put the crisis behind us? The reforms we propose are ultimately very different in nature. Some can be implemented relatively rapidly. For instance, it would only take a few quick policy adjustments to improve conditions for migration within the Monetary Union. On the other hand, the introduction of a common European unemployment insurance would evidently be a project with a much longer timeframe of ten years or more. In light of this, there is no "one-size-fits-all" solution. What is clear is that it will be a drawn-out process relying on the long-term support of the population to advance this process of integration. But now would be a very good time to start.

Interview by Erich Wittenberg.

The European Central Bank as Lender of Last Resort

by Gerhard Illing and Philipp König

In the wake of the recent European debt crisis, the European Central Bank (ECB) has grown significantly in importance. As the crisis worsened, the ECB needed to take measures that went far beyond standard monetary policy operations—particularly with respect to its function as lender of last resort. It provided the banking sector with almost unlimited liquidity and, in addition, purchased government bonds of distressed countries outright. Eventually, in the summer of 2012, it followed through on its promise to do everything possible to save the euro as a common currency. This announcement temporarily stabilized financial markets and the countries in crisis. Nevertheless, compared to other central banks, the ECB is inhibited in its scope of activities: unlike, for example, the US Federal Reserve (Fed), the European Central Bank has no well-defined institutionally anchored fiscal backing. Consequently, the measures it can take are limited by the maximum loss it can incur. This also means that the ECB must protect itself more than other central banks against financial risks from its monetary policy operations. In particular, during a crisis, this restricts its scope for taking measures to fulfill its mandate—securing price stability. Moreover, the ECB has taken on the role of lender of last resort for euro area governments with its announcement in the fall of 2012 to purchase government bonds of distressed countries in the euro area, if necessary, and under strict conditions. It felt forced to do so because the euro area did not have a fiscal institution capable of stopping the crisis worsening and preventing a breakup of the European Monetary Union. At the same time, however, it is indeed questionable whether such activities are included in the ECB's mandate. The European Stability Mechanism (ESM) would, in principle, be better suited to act as a lender of last resort for governments should future crises occur. However, it should be given access to ECB credit facilities in order to fully perform this function.¹

The primary task of the European Central Bank² is maintaining price stability. The decisive factors for achieving this include a stable banking and financial system accompanied by a functioning monetary policy transmission channel, since a central bank can only indirectly control the general level of prices or the rate of inflation.³ Price stability and financial stability⁴ are therefore complementary objectives: without a smoothly functioning financial system, the transmission of monetary policy impulses is very difficult to attain; at the same time, stable price development is crucial for anchoring price expectations and price setting in the financial sector.⁵ To protect commercial banks from default due to illiquidity and the financial system from serious damage and contagion effects during a crisis, a central bank takes on the role of lender of last resort (LLR).⁶

² In the following, the terms “ECB” and “Eurosystem” are used interchangeably for simplicity.

³ By fixing its key interest rates, a central bank sets the price banks must pay to borrow money from the central bank. In turn, this affects the interest rates on the interbank market; these interest rate changes at the short end of the yield curve also affect longer-term interest rates through arbitrage relationships on the financial markets and ultimately influence investment, savings, and consumption decisions, and hence price and wage changes in the economy.

⁴ Financial stability generally refers to a situation in which the financial system allows for a smooth allocation of real resources through pricing, allocation and management of financial risks (liquidity risk, credit default risk, interest and exchange rate risks, etc.), see G. Schinasi, “Defining Financial Stability,” IMF Working Paper, WP 04/187 (International Monetary Fund, October 2004).

⁵ Hyman Minsky has stated that price stability can even lead to instability in the financial sector if reduced macroeconomic volatility induced by higher price stability is perceived as reducing risks and financial institutions increase their risk-taking. However, this should not be a valid argument to deviate from a goal of price stability but rather speaks in favor of a stronger emphasis on financial stability in the objective function of the central bank and the macro-prudential regulator, see e.g., C. Goodhart, “Lessons for Monetary Policy from the Euro Area Crisis,” *Journal of Macroeconomics*, 39 (Part B) (2004).

⁶ See R. Hawtrey, *The Art of Central Banking*, 2nd ed. (Oxford: Frank Cass and Company Ltd., 1962), 123.

¹ The present report is part of a DIW Economic Bulletin series addressing various elements of a strategy for institutional reform of the euro area. See F. Fichtner, M. Fratzscher, M. Podstawski, and D. Ulbricht, “Making the Euro Area Fit for the Future,” *DIW Economic Bulletin*, no. 9 (2014).

Liquidity Crises and Self-Fulfilling Expectations

Banks finance long-term illiquid and often non-marketable assets to a large extent by short-term liabilities exchangeable at any time for legal tender at their nominal value. This balance sheet structure makes banks fragile because their economic survival depends, in particular, on the expectations of their depositors and creditors: as long as they expect that a bank can always meet its liabilities, there is no reason to withdraw deposits. Yet, it all looks very different when there is a sudden loss of confidence and fears of bank insolvency. Since financial institutions usually only cover a fraction of their deposits with cash or other liquid assets, large deposit withdrawals can even drive an otherwise solvent bank into illiquidity default. Consequently, banks are exposed to situations of multiple equilibria brought about by self-fulfilling expectations: in one equilibrium, say, the “good” equilibrium, they will not get into liquidity difficulties, whereas in the “bad” equilibrium, they may become illiquid and go bankrupt even if they are otherwise solvent.⁷

If a bank is exposed to withdrawals of its deposit liabilities, often its access to the interbank market, where financial institutions borrow money from one another, is also blocked. In a systemic crisis affecting the whole banking system, even the interbank market may collapse in certain circumstances. In such cases, a bank can only generate liquidity through fire-sales of its assets. Since such fire-sales occur at prices below the assets' fundamental values, the bank is threatened by significant losses which can aggravate its liquidity problem and, in fact, may turn it into a solvency problem. If several financial institutions sell similar assets at the same time, downward pressure on prices will mount, resulting in the need for more distressed sales—thus creating a downward spiral.⁸

⁷ See D. Diamond and P. Dybvig, “Bank Runs, Deposit Insurance and Liquidity,” *Journal of Political Economy* 91 (1983): 401-419; J.-C. Rochet and X. Vives, “Coordination Failures and the Lender of Last Resort – Was Bagehot Right after all?,” *Journal of the European Economic Association* 6 (2) (2004): 1116-1147; F. Allen and D. Gale, “Understanding Financial Crises,” *Clarendon Lectures in Finance* (Oxford University Press, 2009).

Bank runs by small customers, as still existed in industrialized countries up until the 1930s can largely be prevented by government deposit insurance today. However, “electronic bankruns” triggered by institutional depositors, money market funds, or other banks not protected by government deposit guarantees and where deposits can usually be withdrawn in a very short period of time are problematic; an example of this is the British bank Northern Rock, outlined by H.-S. Shin, “Reflections on Northern Rock: The Bank-Run that Heralded the Global Financial Crisis,” *Journal of Economic Perspectives* 23 (1) (2009): 101-119.

⁸ M. Brunnermeier and L. H. Pedersen, “Market and Funding Liquidity,” *The Review of Financial Studies* 22 (2008): 2201-2238; S. Morris, and H.-S. Shin, “Liquidity Black Holes,” *Review of Finance* 8 (1) (2004): 1-18; Geneva Reports on the World Economy 11, “The Fundamental Principles of Financial Regulation,” Centre for Economic Policy Research (2009).

A Central Bank as Lender of Last Resort

In such a situation, the only institution capable to satisfy the excess demand for secure and liquid assets, to support the banking sector, and to restore financial stability is the central bank in its role as lender of last resort. Since a central bank can never become insolvent in its own currency due to its monopoly of issuing the legal tender, it is able to mitigate the effects of a banking crisis by providing additional central bank money, thereby preventing the occurrence of the “bad” equilibrium. The LLR function is therefore derived directly from the central bank's monopoly on issuing legal tender and the resulting structural dependency of the banking sector on the central bank.

Banks always need a minimum amount of central bank liquidity in order to conduct their business. Normally, a central bank makes these funds available in sufficient quantities as part of its liquidity management strategy. In times where there is no financial turmoil, it is sufficient to provide only as much central bank liquidity to the commercial banking sector as is required on aggregate. The allocation of available liquidity among the individual banks is then left to the interbank market.⁹

The LLR function of the central bank can therefore be seen as the continuation of its liquidity management strategy during a crisis when the functioning of the financial system's institutions commonly used to implement monetary policy are impaired and there is a risk of individual or systemic liquidity crises. As a result, the transition from a central bank implementing its regular liquidity management strategy to it exercising its function as lender of last resort occurs in line with crisis developments. The most important changes compared to non-crisis times are:

A stronger emphasis in the objective function of the central bank is placed on securing financial stability. The fact that sufficient liquidity is provided to the banking sector to secure financial stability ultimately also serves to secure price stability. What in normal times might cause higher inflation rates becomes crucial to securing price stability during a financial crisis.

Liquidity management becomes less rule-based, but is rather driven by discretionary decisions taken by the central bank.

⁹ See U. Bindseil, *Monetary Policy Implementation – Theory, Past and Present* (London, 2004); for a brief overview, see also M. Fratzscher, P. König, and C. Lambert, “Liquiditätsmanagement des Eurosystems im Zeichen der Krise,” *DIW Wochenbericht*, no. 44 (2013).

Box 1

Emergency Liquidity Assistance (ELA)

Emergency Liquidity Assistance (ELA) is still the European Central Bank's only and most important instrument to provide liquidity for individual banks. The ECB's role as lender of last resort (LLR) is frequently equated with the ELA.¹

In contrast to all other monetary policy operations, the ELA provides central bank liquidity solely through the responsible national central bank.² In principle, these operations are only aimed at illiquid but solvent banks. Only the national central banks, which are also solely liable for the associated risks, decide on the respective terms and conditions (amount, deposited securities, risk premiums, interest) at which the ELA loans are provided; there is no risk-sharing according to the ECB's capital key, as with other monetary policy operations.

The ECB already provides a marginal lending facility as part of its regular liquidity management activities in which banks may receive any desired amount of liquidity overnight, as long as they have the corresponding Central Bank collateral. A bank may normally only obtain ELA loans if it has fully exhausted its collateral pool. Herein lies the main point of criticism of these operations: a bank that has already fully exhausted its Central Bank collateral will most probably not only have a liquidity problem but, in fact, also a solvency problem. The latter would, in turn, fall within the competence of national regulatory authorities and of the fiscal authorities, and not within the remit of national central banks. As a result, the ELA enables a member state to prevaricate on solving a bank's solvency problem by pressing the country's national bank to carry out quasi-fiscal activities. This problem is particularly relevant when the resolution of a bank is associated with high fiscal costs which would put significant strain on the government's budget. Although ELA lending may not contravene the prohibition on monetary financing (Article 123, TFEU), the distinction is far more difficult to determine here than in other cases³ and its misuse for the purposes of monetary financing is very difficult to prove. In addition, the process for granting ELA loans is not transparent. Generally, no bank has an entitlement to such loans. This means that the ECB and/or the national central banks are pursuing the concept of "constructive ambiguity": there

are no explicit criteria as to when and to whom ELA loans are granted. This is intended to prevent any possible moral hazard that might occur if banks ex ante expect to be granted ELA loans and would take more risks as a result.⁴ Nevertheless, most ELA cases are eventually announced, although refusals are not made public. This weakens the approach of constructive ambiguity in preventing moral hazard. Only when rejected requests for ELA loans are in fact transparent can a bank no longer be sure of actually receiving liquidity assistance in times of crisis.

At the same time, applying the concept of constructive ambiguity also undermines its ability to control the expectations of market participants with an explicit commitment to the LLR function. The Central Bank can help ensure that "bad" equilibria never emerge by exploiting the "expectations channel." Market participants would therefore know from the outset that liquidity problems simply cannot occur.

Due to the risk of it being misused for fiscal policy purposes and its accompanying lack of transparency, the ELA facility should therefore be viewed with skepticism. The question as to how effective the approach of constructive ambiguity actually is in preventing potential moral hazard has not yet been sufficiently resolved.

On the other hand, it is completely understandable why the national central banks and the ECB have continued with this practice to the present day.⁵ There is not necessarily a direct link between the stocks of approved Central Bank collateral and the insolvency of a bank. Consequently, the Central Bank retains the option of supporting an illiquid bank despite it having a depleted pool of collateral. But in order to protect third-parties against losses due to ELA loans being incorrectly given to insolvent banks, the risk from awarding these loans remains with the respective national central bank. It therefore follows that the national central bank must also be able to determine appropriate terms and conditions.

¹ For example, C. Goodhart, "Myths about the Lender of Last Resort," *International Finance* 2 (3) (1999): 339-360.

² The Board of Governors of the ECB, with a two-thirds majority, can restrict or prohibit ELA lending above a threshold of two billion euros.

³ The most obvious case of monetary financing would be, for example, the Central Bank purchasing government bonds on the primary market.

⁴ ECB, *Monthly Bulletin: 10th Anniversary of the ECB* (2008), 123.

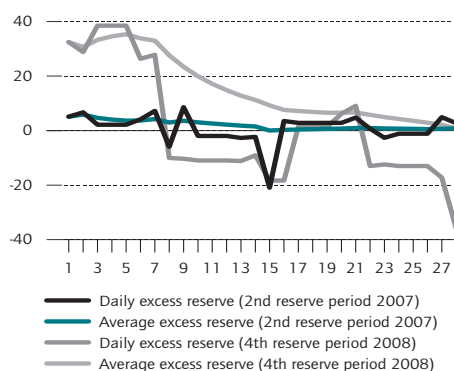
⁵ During the crisis, a number of countries made full use of the ELA including Germany, Ireland, Cyprus, and Greece, see Unicredit Research, "Digging into ELA," *Economic Special* (May 2012), www.research.unicreditgroup.eu/DocsKey/economics_docs_2012_127006.ashx?KEY=C814QI31Ejqlm_1zJDBJDmMnEO6thgFdPjpWWIIVc%3D&EXT=pdf or Morgan Stanley Research, *Emergency Liquidity Provision in the Euro Area* (November 2010), http://estatico.vozpopuli.com/upload/Luis_Rey/emergency-liquidity-assistance.pdf.

Nevertheless, it would now seem urgent to reconsider and restructure the practice of ELA lending in the euro area. First, the provision of ELA-loans should be made more transparent—if this is not immediately possible, granted and refused loan applications should be made public after a slight delay. Second, the ELA should, like all other monetary policy operations, be put under the control of the ECB so it can prevent any potential misuse. This also implies that risks from ELA should be divided in accordance with the ECB's capital key. Third, specific regulations should be stipulated in advance—in particular, approved ELA collateral and its corresponding haircuts. The collateral framework can indeed be broad in scope. Certainly, stipulating regulations in advance would provide better opportunities to prevent cases of insolvency and, at the same time, give banks additional incentives to behave more cautiously.

Figure 1

Excess Reserve Holdings¹ during typical maintenance periods before and during the Crisis

In billions of euros



¹ The excess reserve is the difference between reserve holdings and the minimum reserve.

Sources: European Central Bank; calculations by DIW Berlin.

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During the financial crisis, many banks increased their liquidity reserves beyond the minimum requirement at the beginning of reserve periods.

The central bank's financial risks increase. It grants more loans to banks that have no market access and pose a greater risk of defaulting. In addition, all credit default risks and the correlation between the default risks of borrowers and their deposited securities increases in any case during a systemic crisis. Further, triggered by unconventional monetary policy measures, the central bank includes additional risk factors to its balance sheet.¹⁰

The central bank increasingly replaces the interbank market. Since ailing banks can no longer compensate for their liquidity outflows via the market, they increase their borrowing from the central bank. Conversely, the healthy banks do not on-lend their liquidity inflows and deposit them at the central bank, which thus replaces both supply and demand side of the interbank market.¹¹

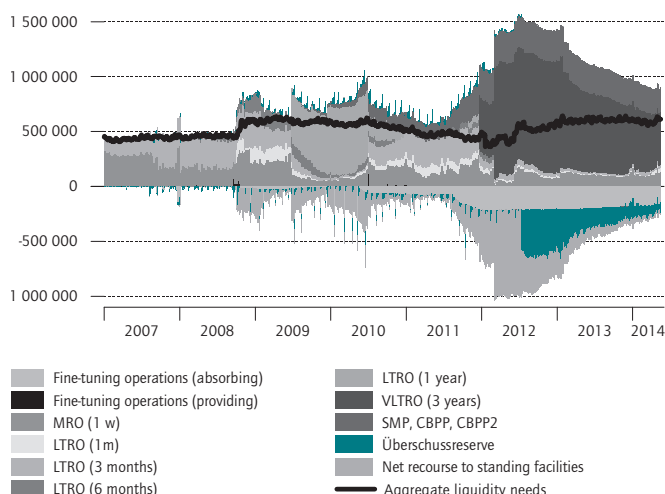
¹⁰ See U. Bindseil and P. König, „Target2 and the European Sovereign Debt Crisis,” *Kredit und Capital* 45 (2) (2004): 135-174.

¹¹ Bindseil and König, „Target2”: 144 ff.

Figure 2

Monetary Policy Operations of the European Central Bank

In billions of euros (liquidity-absorbing operations denoted by a negative sign)



Sources: European Central Bank; calculations by DIW Berlin.

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The ECB has made substantially more liquidity available to the banks, particularly since 2012.

The European Central Bank's Crisis Measures

In principle, LLR measures can be divided into those that the Central Bank makes available to all banks equally and those that deliberately target one particular bank.¹² Measures specifically aimed at individual credit institutions are also frequently made available during non-crisis periods to counter unexpected liquidity problems at individual financial institutions (see Box 1). Like most other central banks, the ECB primarily targeted its measures at the entire banking sector during the crisis.

Summer 2007–Fall 2008

The first phase of the crisis between summer 2007 and fall 2008 was characterized by growing uncertainty on the financial markets and an accompanying increase

in risk premia. To mitigate their exposure to liquidity shocks, banks in the euro area increased their central bank reserves at the beginning of reserve maintenance periods thereby reducing their reserve requirements at the end of a reserve period¹³ (see Figure 1). The ECB accommodated this behavior by raising the provision of central bank liquidity at the beginning of the maintenance periods without, however, increasing aggregate liquidity during the periods. At the beginning of 2008, the ECB also extended the average maturity of its refinancing operations, which further reduced uncertainty about liquidity available in the future.

Fall 2008–Spring 2010

The financial market situation deteriorated with the collapse of US investment bank Lehman Brothers in the fall of 2008; credit risk and liquidity premia dramatically increased and interbank markets around the world collapsed. The ECB countered these developments with a package of measures:

It no longer restricted the amount of liquidity provided: banks have since been able to borrow Central Bank money up to the amount of their available Central Bank securities. By this so-called fixed-rate full-allotment procedure, the ECB assumes the role of a buffer and absorbs shocks which, during normal periods, would be absorbed by the market. The full allotment procedure allows the build-up of considerable excess liquidity.¹⁴ Accordingly, in the course of the crisis, banks also significantly increased their recourse to the ECB deposit facility where they can safely deposit any excess liquidity (see Figure 2).

The ECB extended the average maturity of monetary policy operations by introducing additional transactions with maturities of six months and one year. This reduced banks' uncertainty about liquidity available in the future.

¹³ Banks approved as Eurosystem counterparties must hold a minimum reserve requirement in their Central Bank account over a certain period of time (known as the reserve period). This amount is currently one percent of the reserve base which is largely determined by the institute's deposits; see ECB, "The implementation of monetary policy in the euro area – General documentation on Eurosystem monetary policy instruments and procedures" (2012).

¹⁴ The term "excess liquidity" refers to the difference between the liquidity provided by the central bank and the average liquidity required by banks on aggregate during a reserve period. The latter can be calculated from the balance sheet of the Eurosystem as the difference between aggregate open market transactions and average minimum reserves and net autonomous factors (liquidity changing factors not controlled by monetary policy) of ECB liabilities. This is shown in Figure 2 as an increase in reserve accounts and deposit facilities.

¹² U. Bindseil, "Central bank financial crisis management – a practical perspective with risk management focus," (unpublished manuscript), www.wiwi.uni-frankfurt.de/professoren/wieland/vfs/papers2008/Bindseil.pdf.

The ECB provided euro area banks with foreign currency liquidity as part of cooperative programs with other central banks.

The list of securities that banks can pledge to the ECB as collateral was lengthened significantly. Thereby the ECB lowered the liquidity premia of certain asset classes and increased the potential availability of liquidity (see Figure 3).

Finally, the ECB conducted outright transactions of covered bonds (CBP program) to improve banks' funding conditions in this important segment of the financial market (see Figure 4).¹⁵

At the end of 2009, decreasing tensions on the financial markets led the ECB to slowly reintroduce its standard liquidity management strategy: it no longer provided foreign currency liquidity, it stopped additional longer-term refinancing operations, and it stopped the fixed-rate full-allotment in its regular operations with maturity of three months.

Since Spring 2010

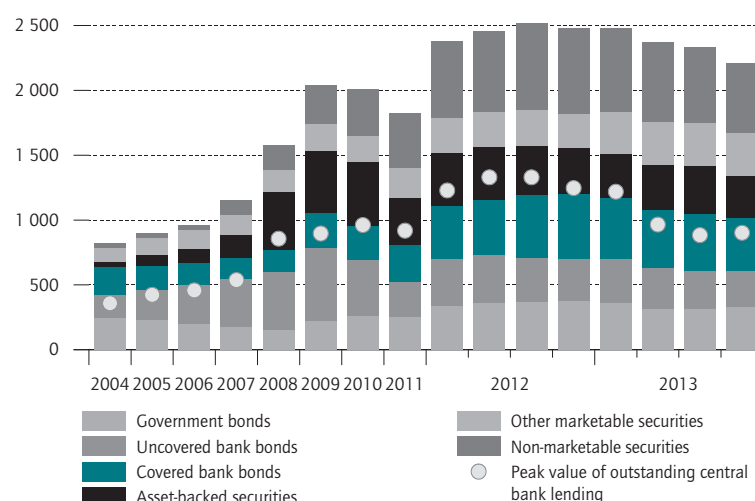
In spring 2010, however, the crisis in the euro area intensified once again and further evolved into a full-blown debt crisis for both the private and public sectors. Sovereign debt and banking problems were mutually reinforcing: the high losses on sovereign bonds as a result of increasing risk premia put pressure on domestic banks because they held large stocks of their own country's sovereign debt; in turn, problems in the banking sector impacted on national budgets, largely due to the generous guarantees provided by the governments. As a result, the financial markets fragmented increasingly along national borders within the euro area. The liquidity provided by the ECB—entirely in keeping with its role as lender of last resort—was increasingly in demand by banks in the crisis countries of Greece, Ireland, Portugal, Spain, Italy, and Cyprus, while the excess liquidity went to banks in Germany, Finland, Luxembourg, and the Netherlands in particular (see Figure 5). In 2010, the ECB postponed any plans to return to its normal liquidity management strategy and introduced further measures:

It again extended the average maturity of its refinancing operations through new transactions with three-, six-, and even 12- and 36-month maturities. The operations with 36-month maturities also had, for the first time, a

Figure 3

Use of collateral by the European Central Bank

In billions of euros



Sources: European Central Bank; calculations by DIW Berlin.

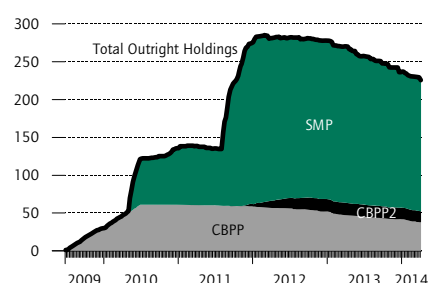
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The ECB has accepted significantly more non-marketable securities since the crisis.

Figure 4

The European Central Bank's Outright Purchase Programs

In billions of euros



Sources: European Central Bank; calculations by DIW Berlin.

© DIW Berlin

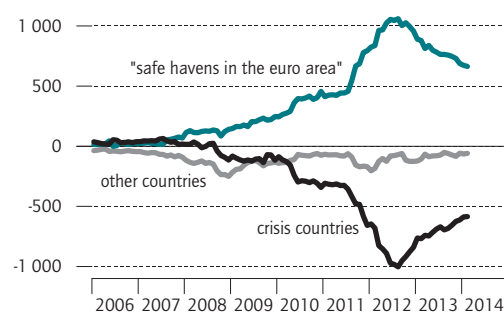
In 2009, the ECB bought covered bonds through the SMP program, then government bonds from 2010.

¹⁵ ECB, "The ECB's response to the financial crisis," Monthly Bulletin (October 2010): 59–74.

Figure 5

Target Balances¹ of National Central Banks

In billions of euros



¹ A negative (positive) target balance reflects net outflows (inflows) of Central Bank liquidity to (from) other countries. The "safe havens in the euro area" are Germany, Luxembourg, the Netherlands, and Finland, the "crisis countries" are Greece, Ireland, Italy, Portugal, Spain, and Cyprus.

Sources: national central banks; calculations by DIW Berlin.

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Since capital from the crisis countries has flowed to the safe havens, the national central banks of the crisis countries accumulated strongly negative target balances, and the safe havens positive ones.

repayment option so that banks could pay back unused liquidity ahead of schedule (see Figure 2).

In addition, the ECB also reintroduced the full allotment procedure in these transactions and explicitly decided to retain it over an extended period of time (currently at least until 2016).¹⁶

Again, the ECB granted cheap dollar liquidity to banks in the euro area via swap lines with the US Federal Reserve.

The ECB bought distressed sovereign debt outright on the secondary market under the umbrella of the newly-designed Securities Market Programme (SMP), thus responding to distortions to the monetary policy transmission channel through excessively high yields on sovereign bonds (see Figure 4).

What's more, it set up a second Covered Bond Purchase Programme (CBPP2) with a volume of up to 40 billion euros. However, due to the low supply of ECB-eligible

covered bonds, the program ended earlier at a volume of only roughly 16 billion euros (see Figure 4).¹⁷

ECB Has Weak Fiscal Support

The crisis measures employed by the ECB in its role as lender of last resort went far beyond the measures it undertakes in non-crisis periods. This raises fundamental questions. What principles should central banks follow in providing LLR support? What should such lending be focused on? And how should the European Central Bank respond to the increasing risks of its measures—i.e., how should it determine hair cuts applied to assets pledged as loan collateralization?

The principles followed by the major central banks in the recent crisis were already largely formulated in the nineteenth century by British economists Henry Thornton and Walter Bagehot.¹⁸ The latter stressed in particular the importance of lending freely in order to prevent a panic—in the case of the ECB, this principle is clearly reflected in the full-allotment procedure and the foreign currency loans it provided.¹⁹

In addition, Bagehot demanded that central bank assistance should be granted only to illiquid but solvent banks.²⁰ In practice, however, it is virtually impossible to clearly distinguish between illiquidity and insolvency, since financial institutions with liquidity problems are usually suspected of being close to insolvency.²¹ According to Bagehot, the central bank could distinguish between the two by providing liquidity only against collateral which is marketable in non-crisis periods. But the problem with this criterion is that an essential part of

¹⁷ See press release from October 31, 2012, www.ecb.europa.eu/press/pr/date/2012/html/pr121031_1.en.html

¹⁸ For a collection of important writings on the LLR, see C. Goodhart and G. Illing, eds., *Financial Crises, Contagion, and the Lender of Last Resort: A Reader* (Oxford University Press, 2002); H. Thornton, *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (London: 1802); W. Bagehot, *Lombard Street – A Description of the Money Market* (New York: 1999 [1873]).

¹⁹ Ebd., 196.

²⁰ It is often argued that Bagehot also postulated banks should pay penalty interest in order to prevent moral risks. However, this is only partially correct. Although Bagehot demanded a high interest rate be paid on the additional liquidity, his reasoning was not aimed at preventing moral hazard. Bagehot developed his ideas at the time of the gold standard. Liquidity injections ran the risk of reducing gold coverage, thereby triggering outflows of gold abroad. A high domestic interest rate was able to prevent this "external drain." This is no longer necessary in a fiat money system. Moreover, Bagehot wanted to maintain the market mechanism as much as possible. In particular, he wanted to reduce incentives for excessively hoarding liquidity for prudential reasons. This is not applicable, however, in the event of a systemic crisis resulting in a collapse of the interbank market. Thus, during the crisis, the central banks abstained from charging higher interest rates on additional liquidity injections.

²¹ C. Goodhart, "Myths about the Lender of Last Resort," in Goodhart and Illing, *Financial Crises* (2002).

¹⁶ M. Draghi, Introductory Statement to ECB press conference, November 7, 2013, www.ecb.europa.eu/press/pressconf/2013/html/is131107.en.html.

Box 2

Monetary Versus Fiscal Dominance

Central government bonds are not exposed to any nominal default risk because, in principle, they can be issued in unlimited amounts.¹ As far as the Central Bank is concerned, there is no risk of insolvency. For investors, however, there is a risk of depreciation in real terms if sovereign debt is monetized. If the Central Bank were to act as lender of last resort (LLR), then it would first attempt to reduce the risk of a deflationary spiral triggered by private investors buying up safe assets. There might be a long-term danger of inflation if the Central Bank had insufficient "fiscal support"—if it had no explicit guarantee from the government to accept potential losses and to cover these losses with future budget surpluses. Fiscal support is therefore a prerequisite for securing "monetary dominance," i.e., the primacy of the Central Bank for price stability—despite fiscal risks resulting from its LLR operations. As long as there is no central authority in the euro area with sufficient fiscal sovereignty, any attempt to split the burden-sharing between individual governments will entail huge coordination problems.

In contrast, in a regime of fiscal dominance, the Central Bank will ultimately have to accommodate the fiscal requirements. Nominal debt allows the option of surprise inflation to alleviate negative output shocks without explicitly declaring a sovereign bankruptcy. The real burden of nominal debt is then reduced by a rise in prices. According to the fiscal theory of pricing, a corresponding adjustment of price levels might even prove to be optimal under certain conditions.²

Institutional arrangements introduced in the euro area explicitly intended to preclude a path toward fiscal dominance: the European Central Bank is an independent institution entrusted with the task of ensuring price stability. The prohibition

of monetary financing via the purchase of government bonds by the ECB on the primary market³ should ensure a regime of monetary dominance and therefore prevent governments financing their public finances through money creation.

However, as the Eurosystem was being drawn up, no attempt was made to clearly define rules for ECB fiscal support.⁴ This was based on the naïve monetarist notion that price level and inflation are determined solely by the level and growth of the money supply. However, contemporary monetary theory shows that price stability is not only determined by the money supply, but crucially also by expectations about future government spending. The Central Bank can only take on the role of lender of last resort and implement it efficiently in times of crisis with adequate support and without endangering the long-term objective of price stability.⁵

The lack of explicit fiscal support might be seen as a commitment device to never act as the LLR. Such an arrangement, however, is not credible as a long-term solution to solve the conflict between monetary and fiscal dominance. On the contrary, if the Central Bank acts too cautiously during a crisis, the risk of aggravating the crisis will further escalate and, ultimately, increase the likelihood of an abrupt change toward a regime of fiscal dominance.

¹ See also Box 1 in this article.

² E. Leeper and X. Zhou, "Inflation's Role in Optimal Monetary-Fiscal Policy," NBER Working Paper, no. 19686 (November 2013).

³ Article 123 TFEU.

⁴ Although ECB arrangements stipulate that all gains and losses from monetary policy operations will be divided according to the capital key, they do not, however, clearly outline to what extent a national state has to recapitalize its own central bank and/or the European Central Bank if losses erode capital.

⁵ C. Sims, "Paper Money," *American Economic Review* 103 (2) (2013): 563–584.

banking business requires investment in non-marketable assets. Furthermore, with a diversified portfolio, it is very difficult to decide on a bank's solvency based on the quality of particular assets which constitute only a certain part of the entire portfolio.

Therefore, the securities rather serve to reduce the central bank's financial risk; on the other hand, extending the security framework can also help reduce liquidity

premiums in certain financial market segments, thus stabilizing the financial institutes' financing conditions.

Despite potential risks associated with additional central bank measures, Bagehot's so-called 'inertia principle' provides a minimal response criterion for central bank operations during a crisis: if the central bank makes its collateral standards more stringent during a crisis, to the same extent as private institutions, it would additionally

tighten liquidity, thus aggravating the crisis.²² As a consequence, central banks should at least keep the collateral standards unchanged or even loosen them during periods of financial stress.

The main problem in determining adequate hair-cuts on collateral to reduce the central bank's risk exposure lies with fluctuations in the market prices of risky assets set independently of fundamentally driven fluctuations, for example, in times of panic when banks fire-sell assets, the market price will fall dramatically.²³ If, however, the central bank manages to stop panic selling with support measures, the market price will stabilize on a much higher level. Therefore, risk control measures should not be aligned to the market price during a panic, but to the market price after normalization. Estimates of these prices, however, may prove to be off the mark in hindsight. Even with drastic reductions to the value of the securities, there is still a risk of losses. Paradoxically, if the central bank's risk assessment is too conservative with haircuts on collateral securities being too large, even greater losses may occur as this may prevent a recovery and as a consequence drive the economy into the "bad" equilibrium. If, however, the central bank prevents a systemic crisis by committing to potentially unlimited interventions, then it can actually make profits if it would carry out assets outright purchases during the crisis at undervalued prices.

Nevertheless, one particularly important question is how to deal with any losses resulting from the activities of the central bank as lender of last resort.²⁴ Its capacity to act as such is limited by the maximum loss it can accept. Since, ultimately, the taxpayer must bear any such losses—either in the form of reduced revenues from central bank profits (seigniorage) or in the form of a central bank recapitalization—a clear division of authority between the national treasury and the central bank is vital. Any monetary policy measure eventually has fiscal effects; in order for the central bank to effectively control the price level, the fiscal impact of its measures needs to be addressed with appropriate responses.

Due to their potentially higher risks, LLR activities inevitably cross the line between monetary and fiscal policy. A clear distinction between monetary policy tasks and fiscal risks is only possible if any losses incurred

are covered by democratically legitimized guarantees from the fiscal authorities.²⁵

Fiscal support of this kind is a prerequisite for "monetary dominance"—the ability of a central bank to fulfill its mandate in the long term irrespective of the risks from its activities (see Box 2). This is precisely the point at which the institutional design of the euro area exhibits a weakness. ECB fiscal support is not clearly defined. This would require explicit fiscal coordination among member states, particularly for periods when Maastricht criteria are generally relaxed (e.g., during a crisis). This type of fiscal coordination is not explicitly included in the Monetary Union treaties. Therefore, the independence as set out in the Treaty is more of a complete separation of the ECB and the fiscal authorities of the euro area. A central bank with a clear macroeconomic mandate is in fact only independent if it can take any measure necessary to meet its mandate.²⁶

The absence of such fiscal support is already reflected in the structure of the ECB balance sheet in non-crisis times because it is not part of the budget of an individual member state. The ECB must, therefore, protect itself against shocks that result in capital losses. As a result, its balance sheet usually includes a relatively large share of foreign currency investments, to improve its portfolio diversification and guarantee a minimum value for its monetary base. In contrast, the balance sheet of the US Federal Reserve, for example, offsets banknote circulation and reserve holdings almost exclusively with short-term government bonds. This reflects the fact that any losses are certain to be borne by the US government, although the risk of incurring losses from adverse asset price developments due to its balance sheet structure are virtually negligible.²⁷

Euro Area Susceptible to Self-Fulfilling Crises

The vulnerability of banks to self-fulfilling liquidity problems arises from the specific structure of the banking business. Banks commit to exchange their liabilities for legal tender at face value at any time, but cannot create legal tender themselves. They are therefore de-

²² U. Bindseil, "Central Bank Financial Crisis Management," in U. Bindseil, R. Gonzalez, and Z. Tabakis, *Risk Management for Central Banks and other Public Investors* (Cambridge: 2009).

²³ Brunnermeier and Pedersen, "Market and Funding Liquidity."

²⁴ Although the central bank is at risk of loss from issuing refinancing loans even during normal periods, these are usually very low because the central bank is normally very conservative in terms of its risk-taking.

²⁵ In order to facilitate the smooth implementation of unconventional monetary policy measures, the British Treasury, for example, gave a similar guarantee to the Bank of England at the beginning of 2012.

²⁶ C. Sims, "The Precarious Fiscal Foundations of EMU," *De Economist* 147 (4) (1999): 415–436.

²⁷ C. Sims, "Fiscal Aspects of Central Bank Independence," CESifo Working Paper Series 547 (2001).

Box 3

Risks to the Central Bank from LLR Activities: the Role of Safe Bonds

In almost all monetary systems in modern industrialized countries, bonds with short-term maturities issued by central governments play a key role as safe bonds. In non-crisis times, both the US Federal Reserve and the Bank of England hold almost exclusively central government bonds. These are considered to be completely safe because they are issued in their own currencies and because they are covered by current and future tax revenues from the entire central government. As they can (in principle) be issued in unlimited quantities, they are not exposed to any nominal default risk. In contrast, bonds from individual US states are normally not used for open market operations.

There are, however, no comparable bonds in the euro area. The bonds of individual national governments are deliberately exposed to explicit default risk. The risk premium imposed by financial market should have a disciplining effect and provide incentives for sound budgetary policies. However, the disciplinary and signaling function of market prices is inevitably distorted if contagion effects pose a situation of multiple equilibria. It is very difficult to empirically estimate to what extent observed rises in risk premiums are the consequence of such contagion effects or whether they are, in fact, the result of an intrinsic increase in credit risk. As long as safe bonds are not available from a central government in the euro area, the European Central Bank must make discretionary case-by-case judgments as to whether, and under which haircuts, it is willing to accept the bonds of individual member states as collateral or as outright purchases.

This inevitably affects the disciplining function of market prices. If, for instance, market participants expect the ECB to change the haircuts for bonds from certain states, this

will immediately impact on market interest rates and hence the budget of the respective state. The problem cannot be solved by relying on private market haircuts as benchmark. In the presence of multiple equilibria, there will inevitably be feedback effects because financial market prices also include expectations about the Central Bank's response. A similar problem arises for efforts to impose risk-weighted capital requirements for government bonds in the financial sector. If these requirements ignore potential instabilities emanating from such feedback effects, there is a risk that such risk-weighting does not act to stabilize the European banking system but further aggravates the vicious circle of sovereign debt in individual national states and the debt of their respective financial sectors in times of crisis.

A sensible design for monetary policy would not even intervene in the market for regional government bonds but—similar to the arrangement with the US Federal Reserve (Fed)—would be restricted to the market for safe bonds from the central government. As long as such bonds are not available, collateral, for example, in the form of “synthetic euro bonds” (bonds from a portfolio of all nation states, weighted according to the respective share of GDP in the entire euro area), could assume this function. Their structure alone would generate appropriate incentives for investors in the financial sector to hold a well-diversified portfolio of bonds from the entire euro area. Currently, the lack of safe bonds is hampering the activities of the Central Bank in acting as lender of last resort and is severely restricting its ability to implement unconventional monetary policy measures.

pendent on the central bank to provide them with additional liquidity in a crisis and act as lender of last resort.

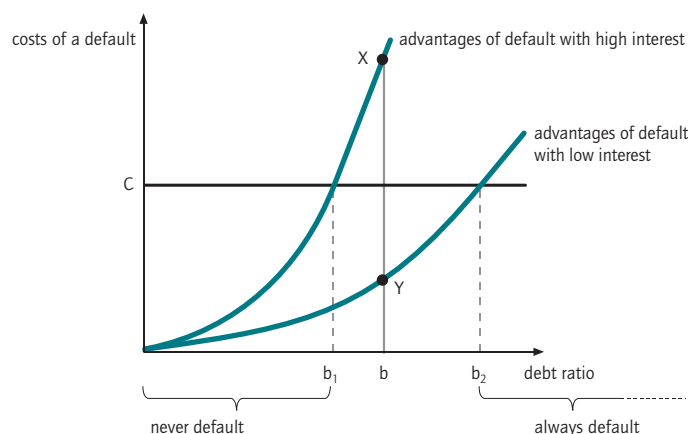
At the same time, sovereign nations indebted in a currency they cannot create on their own are similarly in danger of experiencing a liquidity crisis due to self-fulfilling expectations. Conversely, this danger does not exist for countries indebted in their own currency, the US or UK, for instance. In this case, central government bonds are considered safe bonds because there is no nominal default risk (see Box 3). In the event of a crisis, the government can generate an unlimited amount of the currency in which it is indebted. In contrast, the individual member countries of the euro area are in-

debted in a currency to which those individual governments have deliberately been denied access—their government bonds should be made subject to an explicit default risk.²⁸ In a crisis, investors typically increase their demand for safe assets. This means that they either invest in government bonds of countries that can generate their own currency, or, in the euro area, they re-allocate their funds into bonds of financially buoyant countries that do not require any support measures.

²⁸ C. Sims, “Gaps in the Institutional Structure of the Euro Area,” Banque de France, Financial Stability Review (April 16, 2012): 217–223.

Figure 6

Costs and Benefits of a Sovereign Default



Source: graphic by DIW Berlin, based on P. De Grauwe, "The Governance of a Fragile Eurozone," *Australian Economic Review* 45 (2012): 255–268.

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When interest rates are low, a debt haircut is only "worthwhile" when debt ratios are significantly higher than with high interest rates.

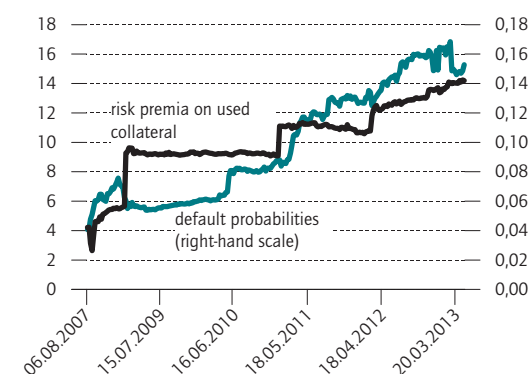
Its specific design makes the euro area vulnerable to contagion effects and self-fulfilling expectations. To illustrate this, suppose that financial markets expect a sovereign borrower to sustainably reduce its debt ratio due to high growth rates. In this case, they only require low risk premia on interest rates. The low interest burden gives the government scope to implement an active growth policy which allows a speedy recovery. Consequently, expectations are self-confirming. On the other hand, however, there is also the risk of a self-fulfilling negative spiral: if a currently high debt ratio triggers fears of a (partial) default, the risk premium on sovereign debt increases, thus further increasing the debt burden. This can lead to a dangerous dynamic in which the solvency of the entire state is endangered. Again, different self-fulfilling equilibria may occur, one of which is clearly worse than the other. With the same fundamental data, either the "good" or the "bad" equilibrium may occur, depending on the expectations prevailing financial markets. In the latter case, the interest rate cannot fulfill the task of a market clearing price to ensure an efficient allocation of risks.²⁹

²⁹ Empirical evidence for the existence of multiple equilibria in the euro area can be found, inter alia, in M. Gärtner and B. Griesbach, "Rating agencies, self-fulfilling prophecy and multiple equilibria? An empirical model of the European sovereign debt crisis 2009–2011," Working Paper 1215 (University of St. Gallen, School of Economics and Political Science, 2012) or P. De Grauwe and C. Ji, "Self-Fulfilling Crises in the Eurozone. An Empirical Test," CAMA Working Papers 37 (The Australian National University, 2012).

Figure 7

Haircuts and Default Probabilities of ECB Collateral

Average values in percent



Source: ECB, Monthly Report, July 2013.

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While the probability of defaulting on deposited securities increased during the crisis, the ECB reduced risk premiums at the same time.

Inspired by experiences in the debt crisis in Latin America, Guillermo Calvo showed that multiple equilibria can arise if there is uncertainty between the central bank and the fiscal authority over the future path of economic policy.³⁰ Calvo's ideas can be applied to the debt crisis in the euro area. A simple graph illustrates the basic idea (see Figure 6):³¹ line C represents the costs of a sovereign bankruptcy (assumed to be constant). These are incurred when economic activity collapses after a debt moratorium and access to the international capital market is restricted. Conversely, potential benefits of a debt haircut increase with a rising debt ratio: because the government can no longer service its outstanding debt, it can use those resources for other purposes. A debt haircut always occurs when benefits exceed costs.

When interest rates are high, the advantages of sovereign bankruptcy increase rapidly with a rising debt ratio (the curve passes through point X). If interest rates are low, however, the curve only increases slowly (it passes through point Y). This is why a default never occurs whenever debt ratios are sufficiently low. Similarly, whenever debt ratios are sufficiently high, a default always occurs. In the mid-range, for example, with

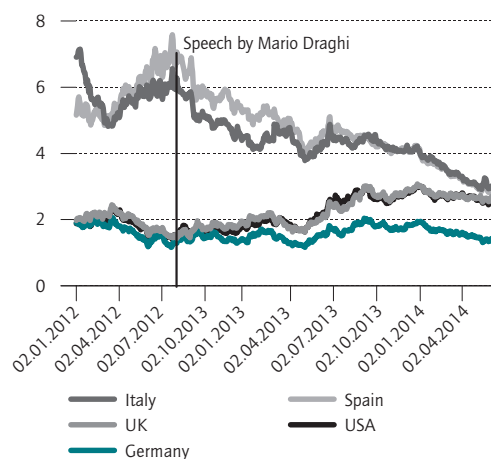
³⁰ G. Calvo, "Servicing the Public Debt: The Role of Expectations," *American Economic Review* 78 (1988): 647–661.

³¹ This graphic from P. De Grauwe, "The Governance of a Fragile Eurozone," *Australian Economic Review* 45 (2012): 255–268.

Figure 8

Government Bond Yields with a Maturity of Ten Years

In percent



Source: Thomson Reuters.

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The announcement by the President of the ECB that he wanted to do everything possible to rescue the euro settled the markets. From then on, Italy and Spain had to pay much less interest.

debt ratio b , two outcomes are possible: if the interest rate is high (point X), a default occurs; but if it remains low (point Y), the debt is serviced. This is a situation of multiple equilibria. The disciplinary function of capital markets fails: instead of offering incentives to rapidly reduce debt, the call for high interest rates leads to a self-fulfilling default.

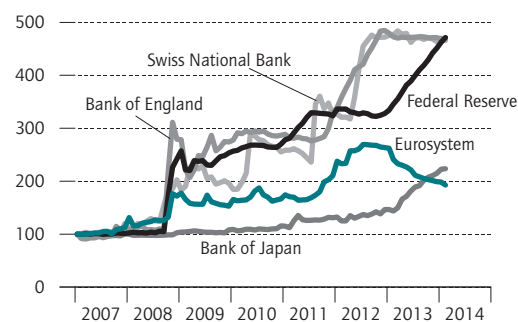
As a consequence, the underlying fundamentals no longer determine the market outcome—rather, which equilibrium will be achieved, depends strongly on expectations of future policy which itself is largely determined by financial markets: the expectations of market participants about the future policy path have a strong influence on which path can ultimately be taken. Changes in sentiment can thus trigger abrupt switches between equilibria. Such events can easily lead to contagion effects between different countries. The occurrence of a “bad” equilibrium in one country may be reflected in the markets participants changing assessments of the situation in a third country.

Empirical studies demonstrate the relevance of such contagion effects. For example, it has been shown that downgrades by rating agencies result in a statistically significant increase in the interest rates of third-party countries which cannot be explained solely by funda-

Figure 9

Expansion of Central Bank Balance Sheets

Index, 2007=100



Sources: European Central Bank; Federal Reserve; Bank of England; Bank of Japan; Swiss National Bank; Thomson Reuters Datastream; calculations by DIW Berlin.

© DIW Berlin

The ECB expanded its balance sheet significantly less during the crisis than other major central banks.

mental factors. In contrast, no evidence of contagion has been found for the case when a country's credit rating has been upgraded.³²

The ECB as Lender of Last Resort for Countries in the Euro Area?

At the outbreak of the crisis, no institutional mechanism was available in the euro area to keep such contagion effects in check. When capital outflows from Greece, Ireland, and Portugal started to affect the much larger economies of Italy and Spain and the fear of a break-up of the entire euro area led to a rapid increase in outflows, neither the fiscal nor the monetary policy authorities had appropriate instruments to reverse the negative spiral of self-fulfilling expectations in financial markets—mainly because it was not clearly defined how the potential burdens would be divided and what conditions would be attached to utilizing such instruments. At that stage, the ECB was the only institution in the euro area able to act quickly enough to take the necessary measures and restore confidence as lender of last resort. However, the effectiveness of the ECB was severely impeded by the lack of fiscal support, which would have absorbed the risks arising from its function as lender of last resort as well as from any bank resolu-

³² See Böninghausen, B. Benjamin, and M. Zabel, “Credit Ratings and Cross-Border Bond Market Spillovers,” LMU Munich Economic Discussion Papers, (2014).

tion. Initially, the ECB's willingness to take appropriate risks was limited, as was the impact of its rescue operations as a whole. This is illustrated, *inter alia*, by the increased haircuts on pledged collateral that accompanied each extension of the collateral framework (see Figure 7). A further example is the fairly limited success of the Securities Markets Programme (the ECB's purchase of government bonds on the secondary market): by announcing that these purchases would be strictly limited and discontinued as soon as possible, it lacked credibility that all would be done needed to prevent the collapse of the Monetary Union. Since the ECB also stated that it would never accept a haircut on its bond portfolio, the loss given default for privately held bonds rose with each purchase. This might have actually reversed the desired effect: Rather than reducing the risk premia on bonds of distressed countries, it resulted instead in a further increase of risk premia. If, in Greece's case, the ECB had accepted a haircut, the taxpayers would have had to cover the corresponding losses. This would have required appropriate fiscal coordination to prevent any inflationary consequences. The ECB obviously did not want to take this risk at the time of the Greek debt restructuring.

Only the Outright Monetary Transactions (OMT) program met the conditions required to avert the threat of a self-fulfilling "bad" equilibrium, when Mario Draghi announced in the summer of 2012 that the ECB is, within its mandate, ready to do whatever it takes to preserve the euro. In addition, the ECB declared that it would also accept *pari passu* status when purchasing sovereign bonds.³³ By doing so, it tried to implicitly secure its "monetary dominance." The OMT was therefore—despite it only being a verbal intervention at the time—very successful in the short term. While it remains debatable to what extent the sharp rise in the interest rate spreads during the crisis was actually due to the risk of a break-up of the euro or due to individual fundamental factors, the fall of interest rates after introduction of the OMT provides a strong indication of its success. If the effect of the OMT program had been confined solely to a redistribution of fundamental risks from the periphery to the core states, the fall in interest rates in the crisis countries should have been accompanied by a corresponding rise in core countries' rates, while, in fact, long-term interest rates for German government bonds, for example, remained significantly lower than those of the US and the UK (see Figure 8). The fall in interest rates therefore suggests that the significant difference in interest rates was predominantly caused by spiraling expectations associated with multiple equilibria.

The rather late introduction of the OMT program during the crisis revealed the structural design flaws of the euro area and the inefficient delays associated with the activities of the European Central Bank as lender of last resort. Its current institutional design reinforced the ECB's tendency to initially act in a reserved and timid manner. This applies more generally to its unwillingness to embrace unconventional monetary policy measures. As a result, the expansion of the Central Bank's balance sheet in the euro area since the outbreak of the financial crisis was much weaker than in other countries affected by the crisis (see Figure 9).

Conclusion

The heated controversy, particularly in Germany, over monetary policy—for example, losses that could be incurred by the European Central Bank ("ECB as a bad bank"³⁴) or the legitimacy of the OMT program—have led many observers to fear that the ECB's power will be called into question again in the future. The European Stability Mechanism (ESM), permanently established in September 2012 by the member states of the European Union, is an important step in preventing this. In the event of a crisis, the ESM may grant financial assistance to defaulting member states in compliance with strict conditionality. To act effectively as lender of last resort for states, however, the ESM would need access to loans from the European Central Bank. In addition, it is imperative that the independence of the ECB in its role as lender of last resort is strengthened by fiscal backing of national parliaments. This is the only way to guarantee fiscal support for its monetary policy operations, comparable with other central banks, along with democratically legitimized enforcement powers. This means that in order to maintain financial stability and consequently price stability the ECB must be able to operate as lender of last resort. However, the Central Bank can only fulfill its mandate if fiscal responses to its measures are forthcoming. Only then can a credible regime of "monetary dominance" be established in which a truly independent Central Bank can meet its mandate of price stability.

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JEL: E52, E58, G21, F36

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³³ See ECB, press release, September 6, 2012.

³⁴ M. Brendel and C. Pauly, "ECB: Zweifelhaft Werte," *Der Spiegel* 23 (2011), available online at www.spiegel.de/spiegel/a-766905.html.

Banking Union and Bank Regulation: Banking Sector Stability in Europe

by Franziska Bremus and Claudia Lambert

Despite the most recent period of calm on the financial markets, the long-term resilience of the European financial system is not yet assured, even several years after the financial crisis began. However, the stability of the financial system plays a crucial role for real economic development and consequently for growth and prosperity. The financial crisis has shown that stricter regulation is required to improve the stability and resilience of the banking system. Further, it has become evident in recent years that banking supervision requires better international coordination in this age of globalization.

The present report first analyzes current developments with regard to the European banking system: what regulatory and institutional changes have been introduced since the crisis? How have market structures and the stability of the banking system developed?

Second, the report proposes recommendations to further promote the stability of the banking system: the European banking sector has not been fully consolidated and this should be driven forward as a matter of urgency. The transparency of the new regulatory and institutional structure should be increased. The close ties between banks and governments must also be loosened further. Beyond the adjustments planned to date, policy makers should promote alternative financing sources for small and medium-size firms, e.g. the direct access to capital markets.

In response to the financial and sovereign debt crisis, various steps have been taken in recent years to reform the architecture of European financial markets.¹ On the one hand, regulations for individual banks were tightened as part of the new Basel III regulatory framework.² On the other hand, the crisis has demonstrated that the regulation and supervision of individual banks is not sufficient to ensure the stability of the entire banking system. The systemic relevance of banks is key—that is, the feedback loop between individual banks and the entire financial system. To better monitor financial stability from a macroeconomic perspective and to identify systemic risks, various institutions have been created in recent years to oversee macroprudential regulation.

The crisis has shown, particularly in Europe, that the regulation of banks which often conduct cross-border operations must be coordinated and directed at the European level—and not at the national level, as has been the case to date. Consequently, a joint European banking supervision is to be implemented as part of the banking union. One important objective of centralized, joint supervision and regulation is to break the vicious cycle of sovereign and bank risk. As a result, the European banking union is intended to resolve the discrepancy between the national focus of financial market supervision and the cross-border dimension of the banking industry.

Since the crisis in the euro area has calmed and the reports of bailouts for banks and governments have fizzled out, the debate on the development of a long-term,

¹ We would like to thank Lino Zeddi for his research support to this Economic Bulletin. The present report is part of a series of DIW Economic Bulletin reports outlining the elements of a strategy to institutionally restructure the Monetary Union. See F. Fichtner, M. Fratzscher, M. Podstawski, and D. Ulbricht, "Making the Euro Area Fit for the Future," DIW Economic Bulletin, no. 9 (2014).

² See Basel Committee on Banking Supervision, Basel III: A Global Regulatory Framework For More Resilient Banks and Banking Systems (Basel: Bank for International Settlements, December 2010, revised in June 2011).

stable financial system has recently been relegated to the backburner. Nevertheless, a continuous discussion that considers interactions between institutional and regulatory innovations is crucial to making the European financial system more resilient and less susceptible to crises in the long term. Even though the new regulatory framework of Basel III, macroprudential regulation, and the banking union represent a step in the right direction, further adjustment is still needed in some areas.

The present report first summarizes the most important regulatory and institutional changes since the recent financial crisis with a focus on the European banking sector.³ The second section then outlines the development of market structures and the stability of the European banking sector since the crisis using micro- and macroprudential indicators. Finally, it discusses the shortcomings of the new financial market architecture which need to be addressed in order to promote a more robust financial system.

Institutional and Regulatory Innovations

In order to better coordinate the work of national regulatory authorities at an international level, several institutions were established in the years following the crisis.

New Institutional Framework

The Financial Stability Board (FSB) was set up in April 2009. Its purpose is to help supervisors and central bankers to identify potential threats to global financial market stability. The FSB cooperates with the International Monetary Fund to identify macroeconomic and financial risks.⁴ The committee's remit also includes promoting the international exchange of information between supervisory authorities, drawing up plans for cross-border crisis management, and making recommendations for efficient regulatory practice.

At European level, cooperation between the national supervisory authorities was strengthened by the creation of the European Banking Authority (EBA) in 2011. In addition, the European Systemic Risk Board (ESRB) was set up as an interface between the System of European Central Banks and the supervisory authorities. One of the aims of these new European institutions is to iden-

tify systemic risks at an early stage, publish guidelines, and issue warnings in the event of adverse developments.

In Germany, for instance, the ESRB's recommendations are implemented through the Financial Stability Act (Finanzstabilitätsgesetz, FinStabG). This law led to the founding, in spring 2013, of the Committee for Financial Stability (Ausschuss für Finanzstabilität, AFS) which is responsible for macroprudential regulation. The AFS analyzes risks to the stability of the financial system at the national level and, on this basis, issues recommendations and warnings. Members of the AFS include representatives of the German Bundesbank, the Federal Ministry of Finance, the Federal Financial Supervisory Authority, and the Chairman of the Management Board of Germany's Federal Agency for Financial Market Stabilisation⁵ (FMSA).⁶ The purpose of this cooperation between the various supervisory authorities is to harmonize micro- and macroprudential regulation.

Stricter Regulation: Basel III

The financial crisis showed that the banks' equity ratio was too low to adequately absorb losses. In addition, it became clear that many banks did not have sufficient liquidity to remain functional in the event of shocks to the interbank market.

In the wake of the financial crisis, the Basel Committee on Banking Supervision thus formulated new regulatory guidelines (Basel III).⁷ These regulations are implemented throughout Europe by means of the EU Capital Requirement Directive IV (CRD IV) and the EU Capital Requirements Regulation (CRR) and aim to make banks more stable without overly compromising their efficiency. They impact two core areas.

First, capital requirements have been tightened. Both the equity ratio and the quality of bank capital should be gradually improved. On the one hand, the risk weighting is stricter, creating higher stocks of risk-weighted assets. On the other hand, risk-weighted assets now need to be secured with equity of at least 10.5 percent. Debt ratios have also been regulated in this regard: the ratio of equity capital to unweighted total assets—known as the leverage ratio—must be at least three percent.

³ The shadow banking sector and other areas of the financial system are not taken into account in this report.

⁴ A. Dombret, "Finanzstabilität wahren: Rahmen, Werkzeuge und Herausforderungen," guest contribution in the Federal Ministry of Finance's Monthly Report (December 2012).

⁵ The FMSA manages the Financial Market Stabilisation Fund (SoFFin) and the restructuring fund (bank levy).

⁶ Federal Ministry of Finance, "Financial Stability Act," Monthly Report (January 31, 2013).

⁷ www.diw.de/de/diw_01.c.413274.de/presse/diw_glossar/basel_iii.html.

Second, the banks are obliged to hold a minimum level of liquidity. Basel III requires banks to have enough short-term liquid assets, such as cash, to secure their short-term ability to pay in the event of a crisis; but a minimum of long-term financial deposits is also required to prevent banks needing to sell long-term assets at a loss on a large scale to meet their payment obligations if there is a crisis. Two key figures are used to check if these criteria have been met—the short-term Liquidity Coverage Ratio (LCR) and the medium-term Net Stable Funding Ratio (NSFR).

The minimum LCR is the difference between a bank's cash outflows and inflows for the next 30 days in relation to its high quality liquid assets.⁸ Under Basel III, this ratio should be at least one, i.e. a bank's liquidity cushion, which includes, for example, cash or Central Bank credit, must be at least as large as expected net outflows over the next 30 days. This is to ensure that banks have sufficient liquidity should investors withdraw capital at short notice.

The structural liquidity ratio (NSFR) sets the available resources in relation to a bank's long-term expected funding needs.⁹ Here, too, the ratio is required to be one or more. The intention is to reduce the banks' dependence on the functioning of the interbank market by reducing disproportionately mismatched maturities. Banks should also be better able to stably refinance their business activities over a time frame of one year.

Introducing Standardized Regulations

Before the financial crisis, the level of international integration in banking markets had risen sharply. As a result, many banks had significantly increased their foreign lending. In addition, they had expanded their network of overseas branches and subsidiaries. Overall, European banking had become increasingly interna-

tional.¹⁰ So far, supervisory legislation has only taken account of this fact to a limited extent: new regulations were often initiated at EU level before being converted into national law - often with restrictions. Regulatory authorities have also been established at national level to date. The financial crisis has shown that harmonizing European banking supervision legislation is necessary to mitigate the impact of national interests on regulation and thereby increase the stability of the European banking sector.¹¹

To this end, the Single Rulebook was adopted in July 2011. It was to ensure that the new rules were applied uniformly in all EU member states. Thus, the directive had to be implemented to the same degree by all European financial institutions. Harmonizing European banking supervision legislation reduces distortions of competition in the European banking market. It also reduces the incentives for banks to be guided in their business decisions by different (national) regulatory standards with varying degrees of stringency.¹²

The regulations for deposit insurance were also further unified in February 2014. Adjustments mainly affect shorter withdrawal periods on deposits if a bank runs into difficulties and a simplification and harmonization of payment modalities. The national insurance systems also have the ability to lend money to each other on a voluntary basis.¹³ As far back as 2011, EU Directive 94/19/EC replaced the prevailing national legislation of EU countries and increased the deposit guarantee in the EU member states to 100,000 Euros per bank and depositor. The objective of this insurance increase was to protect depositors from losses and to increase confidence in the banking system.

Identifying Systemic Risks: Macroprudential Regulation

However, member states do have scope when addressing systemic risks, i.e., risks that not only affect individual banks but also the stability of the entire financial system. One indicator being monitored as part of macroprudential regulation is, for example, the ratio of ag-

⁸ The LCR is calculated as the volume of highly liquid assets in proportion to net cash outflow, i.e., the difference between cash inflows and outflows in the context of a given stress scenario. Flow rates are set at a certain level which could be five to ten percent in the case of savings deposits, depending on the specific type. For customer deposits, which are subject to deposit insurance, national regulation authorities can set an outflow factor of three to five percent. However, the inflow rate of deposits was set to zero percent across the board.

⁹ The NSFR is the ratio of a bank's stable liabilities to required refinancing. In the numerator of this ratio, a bank's liabilities (*available* "stable" funding) are given different weighting factors depending on the stability of the funds. The denominator of the NSFR—*required* "stable" funding—is the sum of all weighted assets. The weighting factors in the numerator increase as the funds become more stable. Thus, the higher the proportion of stable funding, the higher the NSFR. As such private deposits with a maturity of over one year are included with a weighting of 100 percent. Deposits with maturities of less than one year are weighted at 90 or 80 percent.

¹⁰ See F. Allen, T. Beck, E. Carletti, P.R. Lane, D. Schoenmaker, and W. Wagner, "Cross-Border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies," CEPR (London: 2011).

¹¹ See N. Véron, "Tectonic Shifts. Finance & Development," IMF Periodical 51, no. 1 (March 2014).

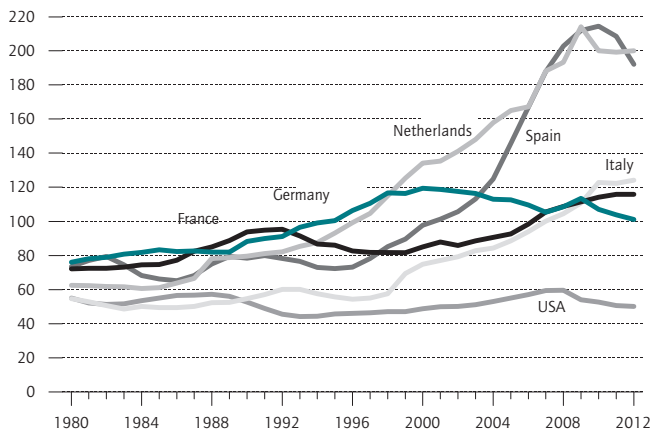
¹² See J. F. Houston, C. Lin, and Y. Ma, "Regulatory Arbitrage and International Bank Flows," *Journal of Finance* 67, no. 5 (2012): 1845–1895.

¹³ Council of the European Union, "Deposit Guarantee Schemes: Council Confirms Agreement with EP," news release 72, Brussels, February 18, 2014, 6562/2/14 REV 2, OR. en.

Figure 1

Domestic Credit to the Private Sector

In relation to GDP in percent



Source: World Bank, World Development Indicators.

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Lending had increased considerably in many European countries up until the financial crisis.

gregate credit of the banking sector to GDP. Since the economic and credit cycles are not completely synchronized in the individual countries, it is useful and important at this point to set country-specific reference values for this indicator.

Some of the standards of the new regulatory framework Basel III are not implemented directly and uniformly. Instead, the rules which are summarized in the CRD IV Directive are implemented by the respective national legislation. In addition to a capital conservation buffer of 2.5 percent, which applies equally to all countries, quotas for the countercyclical capital buffer are to be determined for each country. This buffer can be adjusted annually by the respective national supervisory authorities.¹⁴ The idea of this buffer is to use times of economic boom, i.e., periods of above-average credit growth, to accumulate capital which can then be consumed in times of economic downturn.

¹⁴ In 2019, the capital conservation buffer should be 2.5 percent with an annual adjustment of 0.625 percent. As long as the full amount is not reached, banks should withhold a portion of their profit after taxes to gradually strengthen their capital adequacy. In times of crisis, the buffer can be consumed and therefore also fall under the 2.5 percent level. In contrast, the countercyclical capital buffer is subject to national regulations.

Some European countries implemented additional macroprudential tools.¹⁵ Sweden, for instance, introduced upper limits on loan to value ratios (Loan-to-Value Cap, LTVC) as long ago as October 2010, which set the amount of credit in relation to the market value of the object being financed. The objective was to limit bank losses in the event of a loan default. Switzerland is one of the major financial centers in which, since 2012, an additional countercyclical capital buffer can be activated should undesirable developments occur in the credit markets.¹⁶ Overall, however, the implementation of macroprudential measures has progressed rather slowly.

Supervision and Resolution Under One Roof: The Banking Union

In addition to harmonizing the legal basis for banking regulation in Europe, in December 2012, European finance ministers agreed on joint banking supervision (the Single Supervisory Mechanism, SSM). From November 2014, the European Central Bank (ECB) will supervise 6,000 banks in the euro area. However, it will only directly monitor the 128 largest, systemically relevant banks.¹⁷ All the remaining banks in the euro area will continue to be supervised by their national regulatory authorities. The ECB currently performs an inventory of the risks in the balance sheets of systemically relevant financial institutions in Europe, known as the Asset Quality Review (AQR). The AQR assesses the capital adequacy of these banks according to uniform regulatory standards before the ECB takes over regulation.¹⁸

The second key element of the banking union, in addition to its role as a joint supervisory authority, was the Single Resolution Mechanism (SRM) adopted at the end of 2013. The SRM is intended to enable authorities to orderly restructure and resolve failing banks. The large and internationally networked banks, in particular, require a restructuring mechanism at the European level. To loosen the connection between sovereign and bank risk, in future, owners and creditors are to be initially liable in the event of the bank becoming insolvent, be-

¹⁵ European Systemic Risk Board, Flagship Report on Macro-prudential Policy in the Banking Sector (Frankfurt am Main: 2014).

¹⁶ See Swiss National Bank, Umsetzung des antizyklischen Kapitalpuffers in der Schweiz: Konkretisierung der Rolle der Schweizerischen Nationalbank (Bern: February 2014).

¹⁷ This corresponds to approximately 85 percent of the aggregated balance sheet total of all banks. See Speech by Dr. Joachim Nagel, Executive Board of the Bundesbank on January 16, 2014, Europäische Bankenunion: Ein neues Kapitel der Bankenaufsicht.

¹⁸ For a detailed discussion of the opportunities and risks of AQR, see M. Fratzscher, C. Lambert, and M. Rieth, "Neue Banken- und Fiskalarchitektur für Europa: Krisen vermeiden, statt sie nur zu bewältigen," Wirtschaftsdienst, Sonderheft, 94th edition (2014).

Figure 2

Total Banking Sector Assets

In relation to GDP



Source: ECB, Consolidated Banking Data.

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Total banking sector assets are many times higher than GDP in several European countries.

fore there is recourse to public funds. The so-called bail-in principle was implemented through the Banking Recovery and Resolution Directive (BRRD).¹⁹ A bank-paid resolution fund is set up for the financing of the restructuring of banks. This fund is assumed to accumulate 55 billion euros over a period of eight years from 2016.²⁰

Structure and Stability of the European Banking Sector Since the Crisis

The institutional and regulatory changes of recent years have helped improve data availability with regard to financial stability indicators in many countries. For example, the International Monetary Fund (IMF) provides information on key indicators of macroprudential regula-

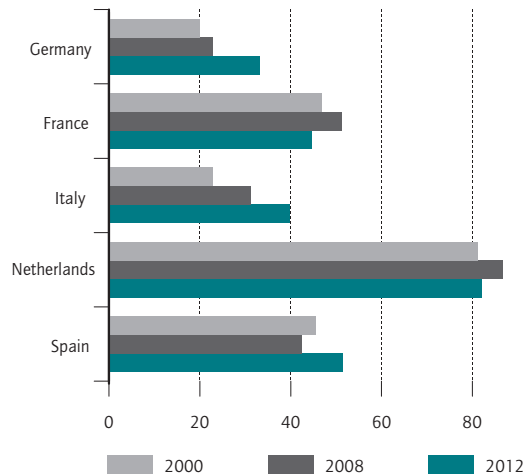
¹⁹ The directive prescribes the following bail-in hierarchy: first the owners are liable, then the junior bond holders, then senior bond holders, and then depositors with deposits of more than 100,000 euros. If a bank needs to be restructured, first there is a bail-in by these private investors amounting to at least eight percent of total assets, before the resolution funds kick in. If that is not sufficient then the government will step in—either with its own funds or loans from the ESM. Direct recapitalization via the ESM is only possible once all these other possibilities have been exhausted.

²⁰ See Federal Ministry of Finance, "Europäische Bankenunion: einheitlicher Abwicklungsmechanismus steht," press release no. 25, May 21, 2014. Initially, banks will pay into the national resolution fund. After two years, 60 percent of the volume of the national fund will then be mutualized.

Figure 3

Market Share of the Five Largest Banks

In percent



Source: ECB, Structural Financial Indicators.

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The development of market concentration in the banking sector has varied across the major euro area countries.

tion for a large number of countries.²¹ Further, the World Bank supplies a wide array of additional data on the development of the financial markets for over 200 countries.²² A variety of financial and structural data on countries in the euro area are available from the ECB.²³ Using this information, the following outlines how structures in the European banking sector have evolved since the crisis, for instance, with regard to the size of the sector, capitalization, and profitability.

Size of European Banking Sector Belies Risks

At the beginning of the crisis, the banking sectors in many industrialized countries had never been so large, in terms of credit volume to GDP.²⁴ While the volume of bank loans to the private sector up until the end of

²¹ See IMF, Financial Soundness Indicators, available online at fsi.imf.org/.

²² See World Bank, Global Financial Development Database, available online at econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTGLOBALFINREPORT/0,,contentMDK:23269602~pagePK:64168182~piPK:64168060~theSitePK:8816097,00.html.

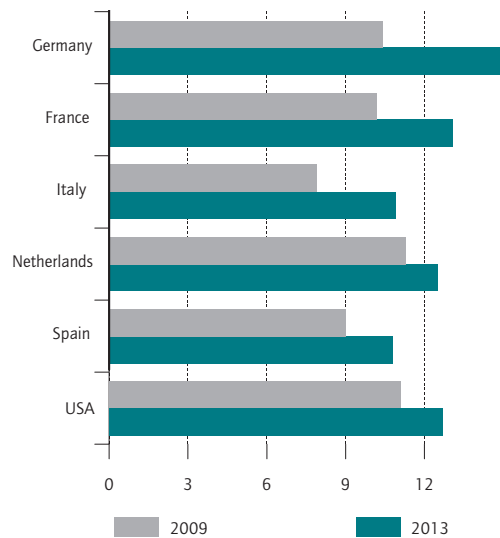
²³ See ECB, Monetary and Financial Statistics, Consolidated Banking Data and Structural Financial Indicators, available online at sdw.ecb.europa.eu/browse.do?node=2018773.

²⁴ See A.M. Taylor, "The Great Leveraging," NBER Working Paper, no. 18290 (Cambridge, MA: 2012).

Figure 4

Core Capital

As a percentage of risk-weighted assets



Sources: IMF, Financial Soundness Indicators; calculations by DIW Berlin.

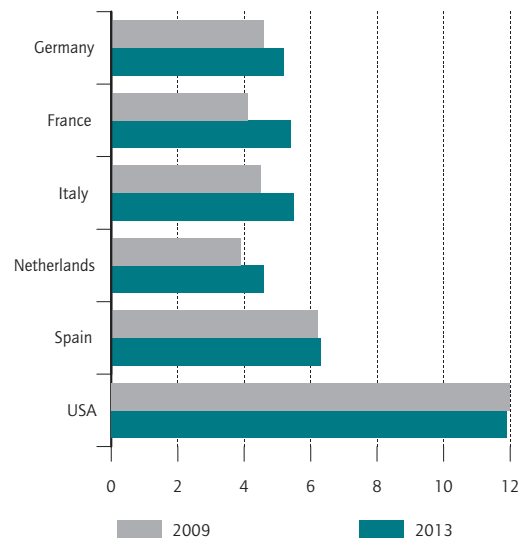
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There has been a pronounced increase in the core capital ratio since the crisis.

Figure 5

Equity Capital

As a percentage of total assets



Source: IMF, Financial Soundness Indicators.

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The equity capital ratio has risen in many European countries since the crisis but remains low compared to the US.

the 1980s amounted to less than 100 percent of GDP in many countries, it had increased rapidly in many places by the time the crisis broke out (see Figure 1). Bank loans to the private sector relative to GDP between 1980 and 2009 in the Netherlands, for example, rose by 150 percentage points and the loan volume in Spain also almost tripled during that period. An economy's credit growth is an important indicator of future crises;²⁵ credit booms may signal that the economy or individual sectors are overheating.

Although in many countries there has been a decrease in loan volumes since the crisis, the banking sector in European countries remains huge. For comparison: in the US, bank lending to the private sector is only about half of GDP,²⁶ bearing in mind that capital markets play a larger role for firm financing than in Europe.

²⁵ See M. Schularick and A. M. Taylor, "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008," *American Economic Review*, vol. 102, no. 2 (April 2012): 1029–1061.

²⁶ This does not take into account the shadow banking sector which, in 2011, had a volume of 23 trillion US dollars in the US and 22 billion US dollars in the euro area. See T. Adrian, A. B. Ashcraft, and N. Cetorelli, "Shadow Bank Monitoring," Federal Reserve Bank of New York Staff Reports, no. 638 (2013).

Also measured as the total assets of all domestic banks in relation to GDP, the size of the sector in larger euro area countries such as Germany, France, and the Netherlands declined slightly between 2008 and 2012 (see Figure 2). Nevertheless, the total assets of banks at the end of 2012 still amounted to approximately three times the GDP of the Monetary Union.

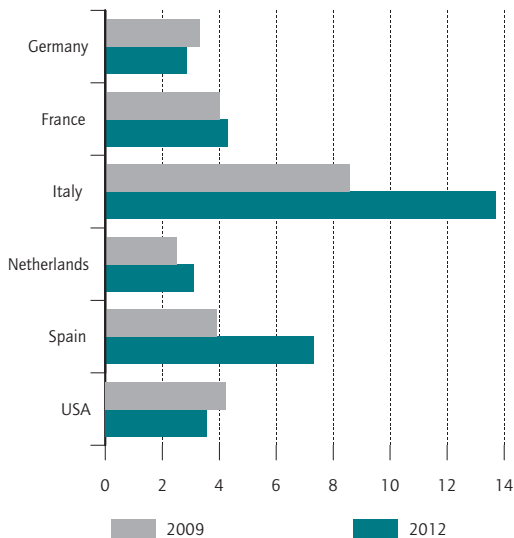
Market concentration of the banking sector has developed differently in the euro area countries in recent years. While the share of total bank assets held by the five largest banks in Germany, Spain, and Italy has continued to increase since the crisis, it has fallen in France and the Netherlands (see Figure 3). On average, the market concentration of the banking system in the euro area has hardly changed since the crisis. If we compare the dominance of the major banks beyond the countries under consideration here, the market share of the five largest banks in Germany is rather low at approximately 30 percent. In contrast, the importance of the major banks in the Netherlands is particularly high with the five largest Dutch banks holding about 80 percent of the entire banking sector's assets.

On the one hand, high market concentration can promote stability: a banking sector with a small number of

Figure 6

Non-Performing Loans

As a percentage of gross loans



Source: IMF, Financial Soundness Indicators.

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In Italy and Spain, the percentage of loans at risk of default has increased considerably since the crisis.

large banks might be easier for the regulatory authorities to monitor.²⁷ In addition, with high market concentration and greater market power, banks can command higher profit margins, thus making it easier to build up capital buffers using retained earnings.²⁸ This improves the resilience of banks to shocks.

On the other hand, high market concentration in the banking sector belies risks for the stability of the industry. If a small number of large banks dominate the market, this creates moral hazard on the part of the banks: since they can expect government support in the event of a crisis due to their systemic importance (“too big to fail”), there are incentives to take more risks than without this implicit government guarantee. Furthermore, where the market is more concentrated, shocks that affect individual major banks have a bigger impact on the economy as a whole.²⁹ The development of the size and

²⁷ For a literature review on the subject of competition, bank size, and stability in the banking sector, see T. Beck, D. Coyle, M. Dewatripont, X. Freixas, and P. Seabright, “Bailing out the banks: reconciling stability and competition,” Center for Economic and Policy Research (CEPR) (London: 2010).

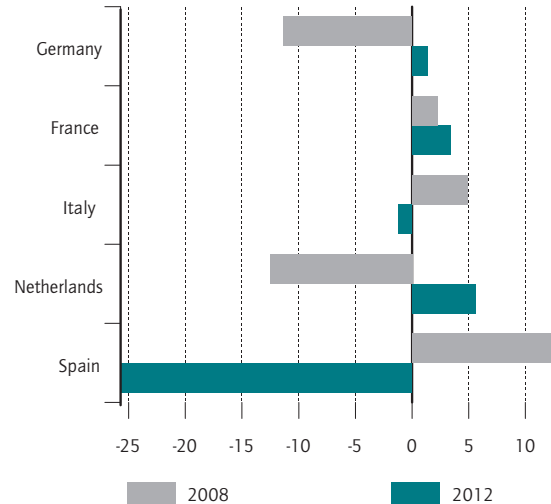
²⁸ See F. Allen and G. Douglas, “Competition and financial stability,” *Journal of Money, Credit and Banking*, vol. 36, no. 3 (2004): 453–480.

²⁹ For more details on the mechanisms, see F. Bremus, “Marktstrukturen im Bankensektor,” *DIW Wochenbericht*, no. 13 (2014); and F. Bremus, C. M. Buch,

Figure 7

Return on Equity

In percent



Source: ECB, Consolidated Banking Data.

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The average return on equity of banks in many European countries is low.

concentration of the banking system should be monitored as part of macroprudential supervision and competition policy. The larger and more concentrated a banking system is, the more important it is to have a functioning supervisory and resolution mechanism.

Debt-Equity Ratio of Banks Remains High

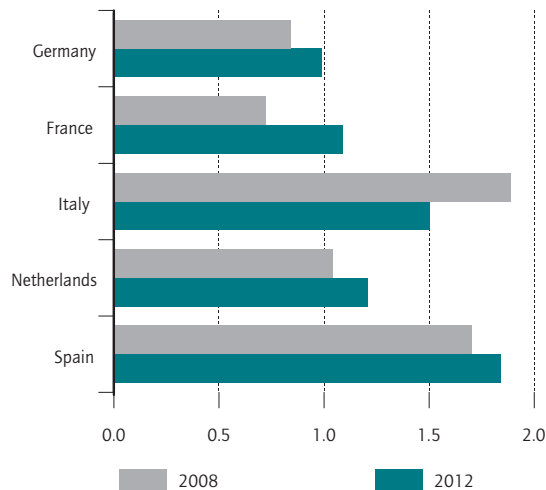
According to Basel III, both the equity ratio and the quality of the capital are to be gradually improved. Considerable progress has been made in the euro area since 2009 with regard to core capital in relation to the banks’ risk-weighted assets. For example, German banks have increased their core capital ratio from an average of about 10 percent to, most recently, approximately 15 percent (see Figure 4). On the one hand, this is due to the reduction of risky claims, and on the other hand, capital was built up by retaining earnings or raising fresh capital—either through the market or through government support measures. In Spain and Italy, too, core capital relative to risk-weighted assets has risen to, most recently, just under 11 percent. The core capital ratio thus lies above the regulatory requirement of 10.5 percent.

K. N. Russ, and M. Schnitzer, “Big Banks and Macroeconomic Outcomes: Theory and Cross-Country Evidence,” NBER Working Paper, no. 19093 (2013).

Figure 8

Net Interest Income

As a percentage of total assets



Source: ECB, Consolidated Banking Data.

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The profitability of the banks in terms of interest income has improved again in many countries since the crisis.

The “simple” capital ratio, i.e., the ratio of equity to banks’ (unweighted) assets, also known as the leverage ratio,³⁰ is however, significantly lower (see Figure 5). Although, on average, capitalization has increased in many places and Basel III criteria have been met, based on the leverage ratio, it is still weak in many countries. Particularly in Germany and the Netherlands, the banking sector is only weakly capitalized with a leverage ratio of around five percent: on average, total assets amount to 20 times the banks’ equity. It is striking that the US banking sector is much better capitalized with a leverage ratio of approximately 12 percent. A comparison of debt-equity ratios indicates that banks in the euro area must do more to increase their loss-bearing capacity.³¹

The quality of bank assets, measured as non-performing loans in relation to gross loans in the banking system, is poor, particularly in Italy and Spain (see Figure 6); in Italy, the volume of non-performing loans increased from approximately eight percent of loans in 2008 to almost 14 percent in 2012. In Spain, this figure nearly doubled between 2008 and 2012 and stood at seven percent in 2012. Bank balance sheets must therefore be

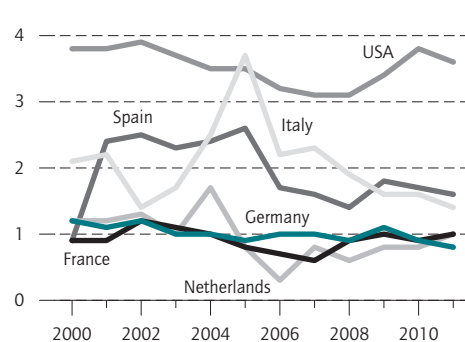
³⁰ www.diw.de/de/diw_01.c.413293.de/presse/diw_glossar/leverage_ratio.html.

³¹ Some experts even claim that equity capital relative to total assets should be 20 to 30 percent. See A. Admati and M. Hellwig, “The bankers’ new clothes. What’s wrong with banking and what to do about it” (2013).

Figure 9

Net Interest Margins

In percent



Source: World Bank, Global Financial Development Database.

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Average net interest margins have been low in many European countries since the crisis.

adjusted further. In Germany, non-performing loans in relation to total loans declined slightly, also thanks to the economic recovery.

Average Profitability of European Banks Comparatively Low

The burden of non-performing loans is also reflected in the banks’ profitability. In Spain and Italy, average return on equity was negative in 2012 (see Figure 7) - so the banking sector had to deal with losses there.³² In the rest of the economies considered here, however, returns in relation to equity were positive in 2012. Return on equity in Germany remained low at approximately one percent. But also in the remaining countries of the Monetary Union, banks were significantly less profitable on average compared to US financial institutions. In the US, returns on equity capital recently reached approximately nine percent. On the one hand, this is because of the more favorable economic situation. On the other hand, the more consistent and faster cleanup of the banking sector has contributed to the more stable development of profitability in the US.

The low returns on equity capital could be interpreted as a sign of continuing overcapacity in the banking sector; where there are a large number of banks with similar business models, competitive pressure between the

³² However, preliminary data from the IMF’s Financial Soundness Indicators reveal positive returns on equity capital for 2013.

banks is high and profit margins are low. However, lower returns on equity are not an indication of overcapacity in the financial system per se: the return on equity can also be low if banks build up reserves. However, interest income and interest margins, which are particularly low in Germany by international standards (see Figures 8 and 9), indicate overcapacity.³³ Low profit margins and fierce competition in the banking sector can lead to banks taking excessive risks.³⁴ Further, it is more difficult to build up capital buffers using retained earnings. If this excess capacity is not adjusted and banks do not develop sustainable business models in the medium term, this can have a negative impact on the stability of the financial system.

Increasing Share of Government Bonds in Bank Portfolios

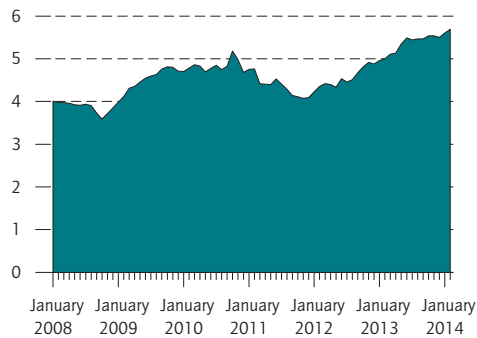
Low margins in the lending business have also contributed—alongside other factors—to European banks having increasingly invested in government bonds during the financial and sovereign debt crisis (see Figure 10).³⁵ A glance at the diversification of banks' government bond portfolios shows that the share of domestic government bonds, based on the banks' euro area government bond portfolios, has also increased since the crisis (see Figure 11). Previously, it had declined considerably in the course of financial market integration in Europe. Among the countries being considered here, the highest percentage of national government bonds in the banks' euro area portfolio was observed in Italy, followed by Spain. But in other European countries, too, sovereign and bank risk became increasingly interconnected.³⁶

Conclusions and Policy Recommendations

The findings above show there needs to be more progress made on the consolidation of the European banking sector to improve the efficiency of the financial system and enable it to withstand future crises in the medi-

Figure 10

Government Bonds from Euro Area Countries As a percentage of total bank assets in the euro area



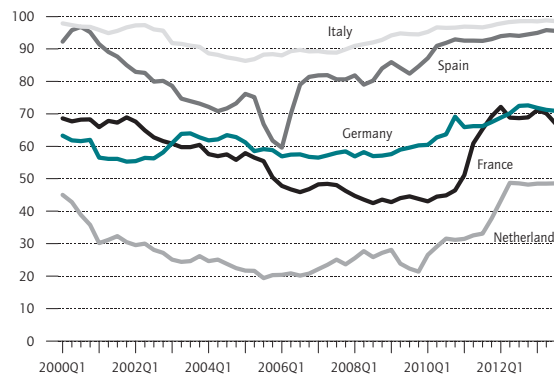
Source: ECB, Monetary and Financial Statistics.

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Financial institutions in the euro area have invested more in government bonds from the euro area since the crisis.

Figure 11

Share of Domestic Government Bonds As a percentage of the euro area government bond portfolio



Sources: ECB, MFI Statistics; calculations by DIW Berlin.

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Financial institutions have held a higher share of domestic government bonds since the crisis.

um and long term. It is not only banking systems in the crisis countries that need further adjusting. The German banking sector, too, is still not healthy and sufficiently resilient to crises. The institutional and regulatory changes in Europe are a step forward and ought to contribute to the future stability of the European bank-

³³ See, for example, M. Hellwig, "Die Risiken trägt der Steuerzahler," *Die Weltwoche*, August 30, 2013, www.weltwoche.ch/ausgaben/2013-35/die-risiken-traegt-der-steuerzahler-die-weltwoche-ausgabe-352013.html; or M. Hellwig, "Deutschland und die Finanzmarktregulierung fünf Jahre nach der Krise," *Ökonomenstimme*, July 12, 2013, www.oekonomenstimme.org/artikel/2013/08/deutschland-und-die-finanzmarktregulierung-fuenfjahre-nach-der-krise/.

³⁴ M. Keeley, "Deposit insurance, risk and market power in banking," *American Economic Review* 80 (2009): 1183–1200.

³⁵ S. Merler, "The liquidity quandary," *Bruegel Blog*, October 23.

³⁶ www.diw.de/de/diw_01.c.412686.de/presse/diw_glossar/staatsanleihen.html.

ing system. But there is still evidence of vulnerabilities. Some areas requiring further work are discussed in the following sections.

Decoupling Bank and Sovereign Risk

Despite the institutional and regulatory reforms, the solvency of a country remains closely linked to the solvency of the banking sector. To effectively decouple the connection between governments and banks, a less privileged treatment of government bonds in the context of banking regulation is necessary.³⁷ As part of liquidity and capital adequacy regulations contained in Basel III, government bonds are given preferential treatment - risk-weights are set at zero.³⁸ Government bonds can be used as liquid assets to meet liquidity criteria. Investing in government securities is therefore particularly attractive for banks.

The introduction of risk weights for sovereign debt securities ought to contribute to a decrease in the share of government bonds on the balance sheets of banks and, therefore, to better portfolio diversification. In addition, the Single Resolution Mechanism (SRM) is particularly relevant on this point. One critical factor in the application of the bail-in principle is, among other things, the close ties between banks: for example, the portfolios of German banks include a large share of securities from other financial institutions.³⁹ But the liability of private investors is only credibly enforceable if there is no risk of contagion throughout the entire banking system. If the new SRM regulations on the liability of private creditors are not applicable in practice, the mutual dependence between banks and sovereigns will remain.

Reducing Excess Capacity

The financial stability indicators suggest that excess capacity persists in the European banking sector. The European Systemic Risk Board has also indicated that the EU banking sector is too large and increasingly concen-

trated.⁴⁰ Part of the required market shakeout in the aftermath of the crisis has yet to be implemented in Europe; in contrast to the US, only very few banks in Europe have been closed or restructured since the crisis. But the rapid restructuring and cleanup of ailing banks' balance sheets is essential in order to permanently overcome the financial and sovereign debt crisis.

A first step in this direction is the Asset Quality Review currently being conducted by the ECB which is aimed at revealing risks and, if there is any doubt, restructuring or closing ailing banks.⁴¹ An essential prerequisite for the cleanup of the European banking sector is a credible and workable resolution and/or restructuring mechanism. The decision to establish the SRM reflects the idea that market exits should no longer be prevented by government intervention.⁴² The question is, however, whether the SRM construct is actually suitable for quickly and efficiently resolving banks. Only practice will reveal whether closing ailing banks is feasible under the SRM in the short term. However, there is a risk that the planned decision process would be too cumbersome in the event of a resolution. Also, the size of the European resolution funds could be too small to resolve a larger number of banks without resorting to taxpayers' money.

Deposit Insurance: Beware of Side Effects

As described in the first section, deposit insurance was increased to 100,000 Euros per depositor and bank during the crisis. However, this high degree of coverage can prevent savers from carefully monitoring and critically assessing their bank's investment decisions, and, if necessary, changing the bank. There is, therefore, an incentive for banks to take excessive risks.⁴³ Various studies have shown that the amount of deposit insurance has an impact on the risk-taking behavior of banks:⁴⁴ for example, in the US, the decision made

³⁷ See C. Buch, T. Körner, and B. Weigert, "Towards deeper financial integration in Europe: What the banking union can contribute," Working Paper 02 (Wiesbaden: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, 2013).

³⁸ See also J. Pöckrandt and S. Radde, "Reformbedarf in der EU-Bankenregulierung: Solvenz von Staaten und Banken entkoppeln," DIW Wochenbericht no. 42 (2012).

³⁹ See T. Hildebrand, J. Rocholl, and A. Schulz, "Flight to Where? Evidence from Bank Investments During the Financial Crisis," Working Paper (Berlin: ESMT, 2012).

⁴⁰ European Systemic Risk Board (ESRB), "Is Europe overbanked?" Report of the advisory committee, no. 4 (Frankfurt am Main: June 2014).

⁴¹ See also an interview with Sabine Lautenschläger (Bundesbank) "Stresstest soll streng ausfallen," November 25, 2013.

⁴² See also I. Schnabel, "Das europäische Bankensystem: Bestandsaufnahme und Herausforderungen," Wirtschaftsdienst, 94th edition (2014).

⁴³ See, for example, D. Anginer, A. Demirgüç-Kunt, and M. Zhu, "How does deposit insurance affect bank risk? Evidence from the recent crisis," *Journal of Banking and Finance* (2013) (forthcoming); A. Demirgüç-Kunt and E. Detragiache, "Does deposit insurance increase banking system stability? An empirical investigation," *Journal of Monetary Economics*, vol. 49, no. 7 (2002): 1373-1406; J. R. Barth, G. Caprio, and R. Levine, "Bank regulation and supervision in 180 countries from 1999 to 2011," *Journal of Economic Financial Policy*, vol. 5 (2013): 111-219.

⁴⁴ R. Gropp and J. Vesala, "Deposit insurance, moral hazard and market monitoring," *Review of Finance*, vol. 8, no. 4 (2004): 571-602.

in 2008 to raise the insurance coverage from 100,000 to 250,000 US Dollars per depositor and bank also increased the risks on the balance sheets of US banks.⁴⁵ It is therefore necessary to consider whether the positive effects of higher deposit insurance outweigh the negative effects of reduced market discipline.

Setting Appropriate Employee Incentives

In addition to reform proposals at banking sector level, the Liikanen Group has urged banks to introduce incentive-based salaries for bank managers.⁴⁶ Remuneration for managers should be better aligned with the long-term success of the bank. False incentives may already exist at loan officer level.⁴⁷ Since employee performance is also measured according to the number of loan contracts sold, current assessment of credit risks may not be stringent enough. Decisions that can endanger the stability of the financial system obviously affect the entire bank, and not just the management level. To ensure the stability of the financial system therefore, incentives should already be aligned at the lowest microeconomic level. Performance incentives for bank employees should be focused on the long term so that risk controls work properly at the individual loan level.

Increasing Transparency

Another weakness of the new European financial market architecture is the lack of transparency. Both the institutional structure and the many new regulatory rules are confusing and complicated. The competencies of the newly created institutions are not always clearly distinguishable. The new constructs are rather opaque for many market participants. This harms market discipline and allows financial institutions to use avoidance strategies. Various experts and commentators therefore argue for simpler regulation.⁴⁸ They are, for example, in favor of abolishing capital regulation based on risk-weights.⁴⁹ The reason for this recommendation is that

capital ratios based on risk-weights are not very meaningful: during the crisis, they did not reflect the actual loss-bearing capacity and were, therefore, also not good indicators of a bank's stability. It is precisely the zero-weighting of certain securities that masks potential risks these titles may conceal.

In addition, the availability of regulatory data should be improved further. Even though, in this respect, progress has been made since the crisis, public access to information on financial stability is still insufficient in many countries.⁵⁰ However, greater transparency with a view to improving the stability of the financial sector is essential in detecting undesirable developments in good time.

Accessing New Sources of Financing

In addition to all efforts to make the European banking system more crisis-proof, other areas of the financial system should not be overlooked. As discussed in the second section, the European banking system is very large compared to that in the US, for instance. The importance of the banking system for financing companies in Europe reinforces the close connection between real and financial economic developments. To better diversify financing sources for companies in Europe, it would be helpful to promote access to bond markets, for example.

In addition, a financial system less based on banks could ensure that it is not only bank balance sheets that are affected in the event of weaknesses in the real economy but the risk could be spread across a wider circle of investors. This could, in turn, break the vicious circle of banking and government solvency.

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JEL: G21, G28, F42

Keywords: Bank regulation, banking union, financial stability, bank market structures, institutional adjustments

⁴⁵ C. Lambert, F. Noth, and U. Schüwer, "How do insured deposits affect bank risk? Evidence from the 2008 Emergency Economic Stabilization Act," DIW Diskussionspapier, no. 1347 (2004).

⁴⁶ High-level Expert Group on reforming the structure of the EU banking sector, chaired by Erkki Liikanen: Final Report. Brussels, October 2, 2012.

⁴⁷ TBerg, "Loan officer incentives and the limits of hard information," NBER Working Paper, no. 19051 (2013).

⁴⁸ See N. Haldane, "The dog and the Frisbee," lecture at Federal Reserve Bank of Kansas City's 36th economic policy symposium: The changing policy landscape, Jackson Hole, Wyoming, 2012.

⁴⁹ See A. Admati, P. DeMarzo, M. Hellwig, and P. Pfleiderer, "Comments on Enhanced prudential standards under section 165, and early remediation requirements under section 166 of the Dodd-Frank Act," Working Paper

(Stanford University and Max Planck Institute for Research on Collective Goods, April 30, 2012).

⁵⁰ For a discussion on data availability and progress, see L. Kodres, "Data Needed for Macroprudential Policymaking," chap. 14 in M. S. Brose, M. D. Flood, D. Krishna, and B. Nicholls, eds., *Handbook of Financial Data and Risk Information* (2013).

GDP-Linked Loans for Greece

by Marcel Fratzscher, Christoph Große Steffen, and Malte Rieth

Greece is standing at a crossroads. The need for a third rescue package has now become a critical issue. The Greek government is calling for another de facto-public debt restructuring. An alternative option presented here would be to convert existing GLF loans into GDP-linked loans. Interest payments would then be linked to the development of Greece's GDP. First, this would reduce the likelihood of Greece defaulting on its loans and, hence, the risk to German taxpayers. Above all, however, it would achieve the aim of stabilizing Greece's debt ratio even if growth was weak. Second, GDP-linked loans would give Greece a greater incentive to take more responsibility for its reforms and improve their chances of success. Third, indexed loans would ease pressure on the Greek government in the short to medium term by temporarily postponing interest payments, and allowing it to pursue a less procyclical fiscal policy. Fourth, lenders would benefit because the loan repayments might ultimately be higher, once the Greek economy has recovered and is growing again.

Five years after the beginning of the economic crisis and four years after international lenders implemented the first bailout programs, Greece finds itself at a crossroads. Despite signs of economic recovery, public finances remain strained. In 2013, both the general government deficit and the primary deficit (excluding interest payments) increased again compared to the previous year. These amounted to 13 and nine percent of gross domestic product (GDP), respectively. Only after adjusting for non-recurring costs there was a primary surplus of around one percent in 2013. In its April 2014 forecasts, the European Commission predicts a further increase of the debt ratio to 177 percent of GDP, which is then to be reduced to around 125 percent by 2020.¹ For 2014 and 2015, the International Monetary Fund (IMF) and the European Commission expect the Greek financing gap to total 12 to 15 billion euros.² It is doubtful whether this gap can be completely closed through the capital market alone.

With the final tranche of the European part of the second rescue package are foreseen to be paid out at the end of 2014, the issue of a third bailout for Greece has become critical. The Greek government is calling for another de facto public haircut in the form of even lower interest, longer maturities, and an extended period of grace of several years for its loans.³ However, this will not be enough to close the financing gap for the coming years, particularly if economic recovery does not pan out as expected which was repeatedly the case in recent years (see Figure 1).

¹ See European Commission, "The Second Economic Adjustment Programme for Greece Fourth Review – April 2014," European Economy (2014).

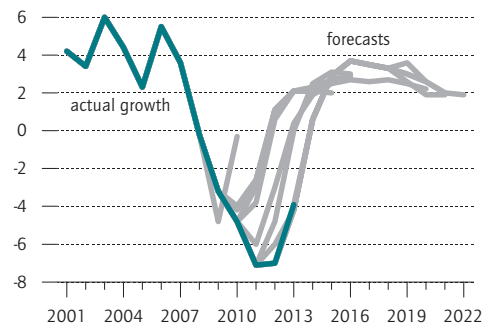
² See European Commission, "Second Economic Adjustment Programme" and International Monetary Fund, "Greece – Fifth review under the extended arrangement under the extended fund facility" (2014).

³ See "Athen will kein drittes Hilfspaket," Handelsblatt live, June 26, 2014.

Figure 1

Predicted and Actual Economic Growth

In percent



Sources: IMF; calculations by DIW Berlin.

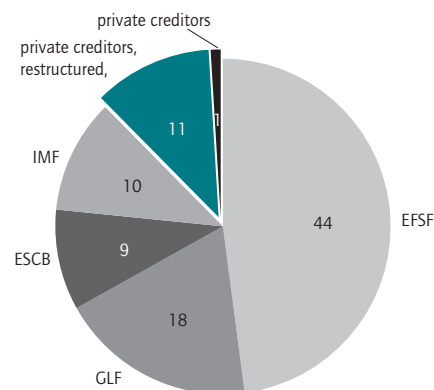
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Growth forecasts for Greece have frequently been off the mark and too optimistic in the past.

Figure 2

Greece's Outstanding Debt by Creditor¹

In percent



¹ The total debt amounts to 302 billion euros (not including 15 billion euros' worth of Treasury bills), as of July 2014. EFSF = European Financial Stability Facility, GLF = Greek Loan Facility, ESCB = European System of Central Banks, IMF = International Monetary Fund.

Sources: EFSF; IMF; European Commission; calculations by DIW Berlin.

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Around 90 percent of the 302 billion euros of long-term national debt is in public ownership.

The present study proposes a different option, whereby public loans are converted into GDP-linked loans, with interest payments linked to the development of Greek GDP. At present, part of the interest payments is already variable as it is tied to economic performance of the euro area, which means Greece would face difficulties if its own economy develops differently.

First Signs of Economic Recovery in Greece

Since the beginning of the year, the macroeconomic situation in Greece has given cause for hope. In the first quarter of 2014, unemployment fell for the first time in around five years. Survey-based leading indicators on consumer confidence or on the economic climate appear to have bottomed out and are now showing stable upward trends. At around one percent of GDP, the current account surplus is expected to be slightly higher this year than in 2013. Moreover, Greece returned to the capital market in April of this year after a four-year absence.

Despite this positive development, the Greek economy continues to be fragile. GDP fell by 3.9 percent last year, and in the first quarter of 2014, it was still 1.1 percent lower than in 2013. Stagnation is expected for 2014 as a whole. Unemployment continues to be alarmingly high at 27 percent. The annual average rate of inflation is still expected to be negative in 2014 and to only just exceed the zero threshold in the near future.

Tackling the High Level of Debt

Greek public debt amounted to around 302 billion euros or 175 percent of GDP in 2013. Hence, the debt ratio is above the level prior to the haircut (170 percent in 2011) which had temporarily reduced it to 157 percent.

With around half of outstanding debt, Greece's biggest creditor is the European Financial Stability Facility (EFSF) (see Figure 2). By the time the second bailout package expires at the turn of 2014/2015, the EFSF's total receivables will amount to 144 billion euros.⁴

The second biggest creditor, with 18 percent, are the members of the euro area, who granted around 53 billion euros in bilateral loans in the first bailout, the Greek Loan Facility (GLF). The International Monetary Fund and the European System of Central Banks (ESCB) each hold around ten percent of the debt. The latter acquired Greek debt securities as part of the European Central Bank's bond purchasing programme (Securities Market Programme, SMP).

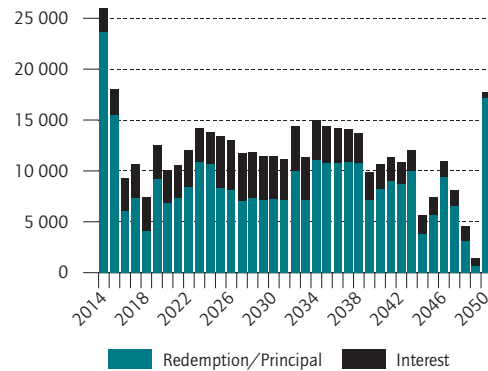
This means that almost 90 percent of long-term liabilities are held by public creditors. The only privately-held liabilities are bonds issued to former owners of Greek debt securities in the course of the debt restructuring and those not included in the debt restructuring.

⁴ They currently amount to 134 billion euros.

Figure 3

Greece's Total Redemptions and Interest Payments

In million euros



Sources: EFSF; IMF; European Commission.

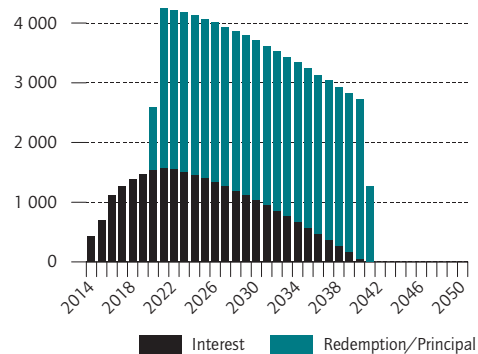
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The repayment burden will be high particularly over the next two years.

Figure 4

Redemptions and Interest Payments in the Greek Loan Facility

In million euros



Sources: EFSF; IMF; European Commission.

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Only interest payments on GLF loans must be paid by 2020.

The debt level and composition is an enormous burden for Greece. In the past year alone, the government had to pay four percent of GDP in interest. This money flows out of the country since almost all liabilities are held outside of Greece, leaving less money for domestic consumption and investment.

In its Fifth Review of Greece dated June 2014, the IMF predicts that the debt ratio in 2020 will drop to 128 percent. This is expected to be achieved through a combination of higher growth, primary surpluses, and lower

interest payments. Specifically, the IMF forecasts that GDP will grow at a rate of 0.6 percent in this year. For the years from 2015 onwards, it anticipates rates of mostly over three percent. Inflation is not expected to exceed the zero threshold until the following year, but then increase to two percent by 2022. The primary surpluses are estimated to be 1.5 percent of GDP in 2014 and three to four percent in the years up to 2022. However, IMF forecasts are fraught with uncertainty. Many observers predict lower growth rates.

Third Bailout?

Overall, Greece will have to make particularly high principal payments in 2014 and 2015 (see Figure 3). On the other hand, interest payments are relatively evenly distributed over the entire repayment period. Consequently, there will be a very high demand for funding in the next two years, which could be met through a third bailout. Another option would be to change existing credit terms.

Loans from the Greek Loan Facility (GLF) have a maturity of 30 years. Repayments are spread over 20 years, not beginning until 2020 (see Figure 4). Interest rates are variable. These are derived from the three-month Euribor and a margin of 50 basis points. The current conditions of the loans are already the result of three renegotiations. In their original form the loans only had a term of five years, and the interest margin was supposed to increase gradually from 300 to 400 basis points. Since the predicted recovery of the Greek economy from 2011 to 2013 did not materialize, however (see Figure 1), conditions were repeatedly relaxed.

In order to estimate future interest payments GLF loans, the money market rates expected by market participants are calculated on the basis of current market prices. The interest payments amount to around 400 million euros or approximately 0.2 percent of nominal GDP in the current year. By 2021, interest payments will increase up to 1,600 million euros and will steadily decline thereafter. The decrease reflects redemptions beginning in 2020.

EFSS loans have a maturity of 40 years. Repayments will not begin until 2023. The interest rates are flexible (see Figure 5) and are derived from current EFSF refinancing costs and a margin for operational costs. However, interest has been deferred until 2023. This will then be settled with the addition of compound interest accrued. As with loans from the GLF, the current conditions are already the result of a renegotiation, during which the terms were extended and interest reduced.

The following conclusions can be drawn from the analysis of the two programs. First, up until 2023, Greece only has to pay interest to its European creditors on loans from the GLF. Therefore, this provides the only possibility for an imminent and direct reduction of the interest burden. Second, maturities are already long, and the first repayments are not due until 2020. Consequently, a maturity extension or a later start of the redemptions would have no direct effect on the interest burden in this decade.⁵

A Proposal for Greece: GDP-Linked Loans

Many of the growth forecasts for Greece made since 2010 have been off the mark. This factor has repeatedly contributed to a situation in which lengthy and politically difficult negotiations on new rescue packages and concessions for existing credit agreements were necessary.

One option for a timely and targeted response to changing macroeconomic conditions is to link (index) the interest rate on GLF loans to the development of Greek GDP. If the growth rate in a particular year is below a predetermined rate, interest is lower. If the opposite is true, it is higher. Interest payments would be in line with the growth rate and thus automatically take into account the financing situation of the Greek government.

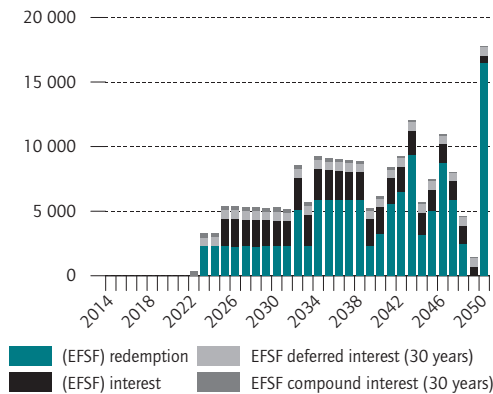
The annual average growth of the Greek economy from 1960 to 2013 was three percent. If this were the predetermined reference growth rate and Greece were to pay an interest rate of four percent on its loans, a GDP-linked interest rate would look as follows: for each percentage point below the three percent mark, Greece pays one percentage point less interest on the loans from the GLF. For instance, at a growth rate of two percent, interest would be reduced to three percent. Conversely, at a growth rate of four percent, the interest rate would increase to five percent.⁶

The idea of tying interest rates to economic conditions has in theory and practice primarily been applied to government bonds.⁷ All proposals are based on the idea

Figure 5

Maturities and Interest in the EFSF Program for Greece

In million euros



Sources: EFSF; IMF; European Commission.

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Interest payments on EFSF loans are deferred until 2023.

that countries can afford to pay higher interest in times of high tax revenue and the burden will be eased in the opposite scenario.⁸

One well-known example of GDP-linked bonds being used in the recent past is in Argentina, where a security was issued with coupon payments linked to Argentinian growth as part of its debt restructuring in 2005. With the Greek debt restructuring in 2012 a similar warrant was issued to the former creditors of Greek government bonds. At less than half a percent of the overall total, this was a negligible amount, however, primarily intended to increase the participation rate of private creditors in the restructuring offer.⁹

Linking loans to GDP would have numerous economic benefits for both Greece and its European creditors. One of the key advantages would be the automatic stabilizer effect. Unlike fixed interest rates, GDP-linked interest rates fall in a recession, such that primary surpluses necessary to service outstanding debt can be lower (for example, through lower taxes) than otherwise. In an upswing, however, the government has to achieve higher primary surpluses than with fixed interest rates. Con-

⁵ They could, however, ease the burden indirectly, for instance, if they lead to lower refinancing costs on the capital market for Greece.

⁶ This simplified rule could be refined in practice. For instance, floors and caps for the interest rate could be fixed in order to take into account uncertainty about potential future growth.

⁷ For example, Shiller proposed issuing US government bonds which earn interest in proportion to US GDP growth, see Shiller, *The New Financial Order: Risk in the 21st Century* (Princeton University Press, 2003). Alternative proposals include linking interest to commodity prices or to exports, see Krugman, "Financing vs. forgiving a debt overhang," *Journal of Development Economics* 29 (1988): 253–68.

⁸ This view on debt sustainability is also shared in the literature on strategic government defaults, see Arellano, "Default risk and income fluctuations in emerging economies," *American Economic Review*, 98 (3) (2008): 690–712. According to this strand of literature, it is precisely during economic downturns that the option of defaulting becomes attractive for a government.

⁹ J. Zettelmeyer, C. Trebesch, and M. Gulati, "Greek debt restructuring," *Economic Policy* (2013): 513–563.

Box

Monte Carlo Simulations and Debt Sustainability Analysis

The macroeconomic simulation model used for quantifying the results is based on Chamon and Mauro's approach (2006).¹ This method uses a model economy with limited debt sustainability, which is in the tradition of an ability-to-pay framework. According to the model, there is a partial default and a debt restructuring as soon as a predetermined debt limit will be exceeded (see below).

The equation for the debt level is as follows:

$$\frac{D_t}{Y_t} = \frac{D_{t-1}}{Y_t} \frac{(1+r)}{(1+g)} - pb_t = \frac{D_{t-1}}{Y_{t-1}} \frac{(1+r)}{(1+g)} \frac{(1+\pi)}{(1+\pi)} - pb_t$$

The debt level is calculated by dividing the nominal debt level in year t (D_t) by nominal GDP (Y_t).

Simulated stochastic paths for the real growth rate of GDP (g_t) and the primary surplus (pb_t) are used to generate scenarios for the development of the debt ratio. The simulated growth rate is based on the IMF forecast. This is expanded by adding volatility and persistence which are estimated on the basis of Greek data. Economic fluctuations and uncertainty over the projection are thus integrated into the model framework (see Figure 1).

In the case of debt indexation, it is assumed that the interest rate is a function of the real growth rate:

$$r_t = \max [\bar{r} + \sigma (g_t - \bar{g}), r^{\min}].$$

The rule states that the indexed interest r_t is at least as high as the minimum interest rate (r^{\min}). Furthermore, it is determined by combining the base interest rate (\bar{r}) and the difference between the growth rate and the reference growth rate ($g_t - \bar{g}$). Finally, a parameter (σ) governs the elasticity of the interest rate with respect to economic fluctuations. When this parameter has higher values, the interest rate reacts more strongly, allowing for a greater "insurance effect" to be achieved.

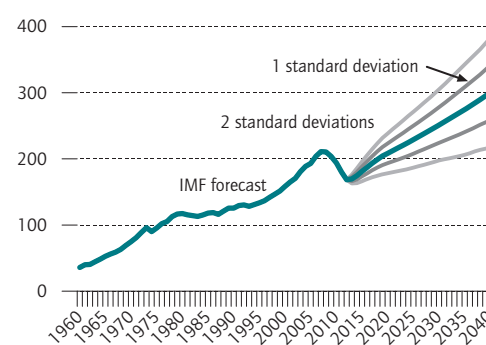
Using a simulation path for real GDP growth rates as an example, Figure 2 illustrates how the interest rule impacts on the actual interest rate. The parameters in the simple interest formula are

¹ M. Chamon and P. Mauro, "Pricing growth-indexed bonds," *Journal of Banking & Finance* 30 (12) (2006): 3349–3366.

Figure 1

IMF Forecast for Greece

Real GDP in billion euros



Sources: IMF; calculations by DIW Berlin.

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selected so that differences from the status quo arising due to macroeconomic fluctuations in Greece are offset over the repayment period in expectation. In particular, interest payments on loans from the GLF have the same expected present values with and without indexation. However, payment differences may arise ex post, i.e. after the end of the repayment period. This is the case if the overall growth of the Greek economy is on average weaker or stronger than predicted by the IMF forecast, and consequently the interest payments differ. Figure 3 shows the distribution of the present value differentials. The mean deviation is 3.77 billion euros; a maximum shortfall in a worst case scenario is reached at a differential in interest payments of just under nine billion euros.

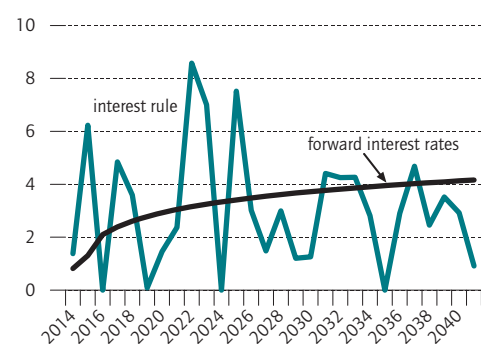
Finally, it is assumed that indexation only affects a share of the overall outstanding debt level. Specifically, this proportion is fixed at the sum of GLF loans in relation to Greece's overall debt level.

The debt limit is numerically determined through simulation of the model in an iterative process. The debt limit is based on the arbitrage-free condition of a risk-neutral investor. In particular, the debt limit is fixed at a default probability at which a hypothetical

Figure 2

Illustration of the Interest Rule

In percent



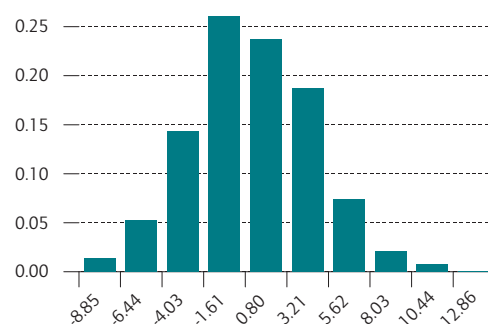
Sources: Thomson Reuters Datastream; calculations by DIW Berlin.

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Figure 3

Probability Distribution of the Present Value Differential

In percent



Source: calculations by DIW Berlin.

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Greek government bond with a coupon of 4.95 percent would be purchased at par by an investor. This corresponds to approximately the coupon rate of the latest Greek bond issuance.² If the debt level reaches the debt limit, restructuring of all outstanding debts is assumed with a recovery rate of 25 percent.

In order to determine the effect of the interest savings on the economic cycle, the interest rate differences from the status quo ($\Delta_i^{(i)}$) need to be calculated. These are added to nominal GDP using a multiplier of one:

$$Y_t = Y_{t-1} \times g_t + \Delta_t^{(i)}$$

Thus, it is possible to determine the smoothing effect on the growth rate from the modified GDP series.

² Thus, the default probability of a risk-neutral investor's Greek bonds is extrapolated from the market price on the assumption that this investor uses an identical model to the one described here for evaluating the default risk.

In the final stage, the repayment profiles of a ten-year bond and of the GLF loans are calculated over all simulation paths. Debt payments are determined on the basis of the simulated debt levels and growth rates using the interest rule described above. The default rates are obtained simultaneously. Specifically, once the debt limit has been reached along a simulation path, it is assumed that a default takes place and that the recovery value is paid out to international investors. In this case, all remaining interest and principal payments are repudiated. For the sake of comparability, the present values of all repayment profiles generated are calculated so that the distribution function across all simulations can be mapped out. Furthermore, it is possible to vary the share of total debt made up of GDP-linked debts, thus allowing the effects of indexation to be calculated for different debt compositions.

sequently, fiscal policy is more countercyclical and contributes to smoother growth rates. This is particularly important for countries, such as Greece, which may lose access to the capital market and are therefore compelled to follow a procyclical fiscal policy—for instance, a debt consolidation during recessions.

The second advantage is that GDP-linked loans reduce the risk of sovereign default. Should growth be unexpectedly weak, interest payments would automatically be reduced. This in turn would reduce the probability of default. If the reverse happens, however, interest would increase, so that in expectations there is no loss of interest for creditors. The decreased likelihood of Greek government insolvency would also have a positive effect on newly issued debt as the associated default risk would also be reduced. This should lower the returns on Greek government bonds and thus continue to make a positive contribution to solvency.

From a political economy point of view, too, a flexible interest mechanism would have its advantages. It would eliminate the need, if growth forecasts prove to be incorrect, to enter into renewed drawn-out and widely unpopular political negotiations on further loan concessions. Moreover, a committed reduction of the debt burden in times of economic downturn might help remove barriers to reform.¹⁰ From the creditors' perspective, indexation should also be more attractive than simply giving the money to the Greek government, in the form of even lower interest rates, for instance, since indexation includes the possibility of higher returns on existing loans.

There are also disadvantages, however. Above all, creditors would be faced with a higher level of uncertainty about future interest payments¹¹ which might prompt them to demand a risk premium for increased uncertainty.

Another disadvantage discussed in the literature is a possible moral hazard.¹² Greece might be tempted to deliberately reduce growth so as to avoid higher interest payments. However, simulations conducted as part of the present study show that for every one percentage point of additional growth, only one-fifth flows out to the

creditors in the form of higher interest. Therefore, there would be no incentive to intentionally suppress growth.

Impact of Interest Rate Indexation on GLF Loans

The effects of indexing interest payments on Greek public finances are quantified in the following sections using a macroeconomic simulation model (see box). In particular, the model shows the impact of GDP-linked loans on cyclical fluctuations, on the probability of loan defaults, and on the level of the debt-to-GDP ratio.

Stabilizing the Economic Cycle

In case of GDP-linked interest payments, the current deficit is lowered during a recession compared to the case without indexation due to saved interest payments. As a result, lower primary surpluses would be sufficient to service the outstanding debt. A tax hike to make up for lower revenues during recessions could thus—at least to some extent—be avoided. The burden on the economy would automatically be alleviated, thus easing the recession. An economic upturn would produce the opposite effect. Then the Greek government would pay higher interest due to the indexation which would reduce public demand and thus have a dampening effect on the economy.

Figure 6 illustrates the stabilizing effect of the government adopting a more countercyclical spending policy, using an example for the interest rate under stochastic growth. Overall, the volatility of the GDP growth rate is reduced by around 20 percent in the model (see Table 1). This shows that an instrument of this type can already significantly attenuate the macroeconomic fluctuations in Greece when applied only to loans from the GLF. If the interest payments on loans for a possible third financial support program were also indexed, this effect would increase to an overall reduction of macroeconomic volatility of 23 percent.

Reducing the Probability of Default

If the growth of the Greek economy should be lower than predicted in the IMF forecast, there would be the threat of another debt restructuring in the medium term. If this risk of a partial default is taken into account, it becomes evident that indexing the interest payments would significantly lower the probability of a debt restructuring. The economic intuition for this result can be explained by the following mechanism: If growth is lower

¹⁰ A. Mourmouras and W. Mayer, "Overcoming barriers to reform: On incentive-compatible international assistance," IMF Working Paper WP/07/231 (2007).

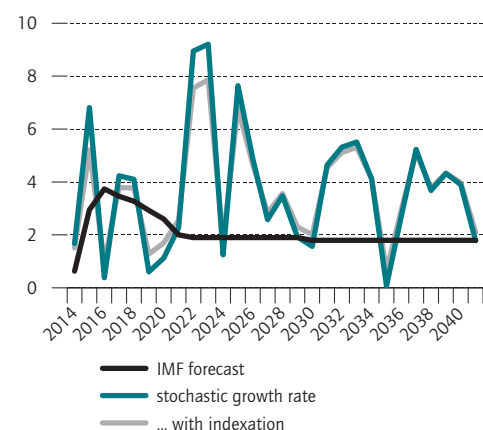
¹¹ For practical reasons, this volatility in payments during the repayment period should be taken into account in the national budget of a creditor country by means of a fund which would have to be set up specifically for this purpose.

¹² E. Borensztein and P. Mauro, "The case for GDP-indexed bonds," *Economic Policy* (2004): 165–216.

Figure 6

Growth Rates of Greece's GDP

In percent



Sources: IMF; calculations by DIW Berlin.

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The economic cycle could be stabilized with indexed loans.

Table 1

Stabilization from Indexation of Greek Loans

In percent or percentage points

	Fluctuations in GDP ¹	Change due to indexation
Without indexation	2.1	-
Indexation of GLF loans	1.7	-19
Including third bailout ²	1.6	-23

¹ Measured as standard deviation of the growth rate in percentage points.² Third financial support program as a 12-billion-euro loan.

Source: calculations by DIW Berlin.

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GDP-linked loans reduce macroeconomic volatility.

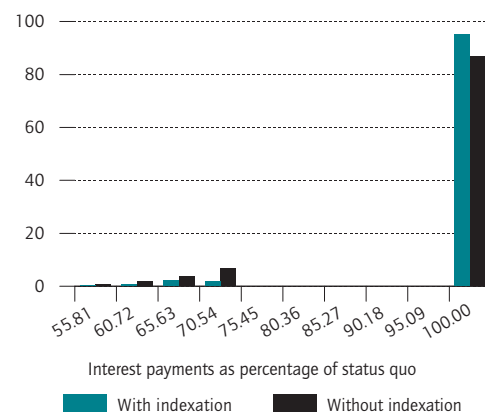
than assumed in the IMF forecast, this may result in an increase in the debt ratio. This increase would be lower if interest payments were tied to the growth rate. Therefore, it is less likely that the debt limit at which there would be a partial payment default would be reached. Since all outstanding public debt is usually affected if sovereign debt is restructured, all creditors would benefit from an indexation of GLF loans. Thus, the Greek government would also profit from increased solvency ex ante, since its financing costs on capital markets would fall.

For the model calculation on the probability of default, it is assumed that 82 percent of funding for Greece is from non-GDP-linked loans, while the interest on the

Figure 7

Probability Distribution of Present Values with Loan Indexation

In Prozent



Source: calculations by DIW Berlin.

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Default probability could be significantly reduced if loans were partly indexed.

GLF, which makes up the remaining 18 percent, is tied to the growth rate.¹³ In order to simplify the calculation, it is assumed that the maturity of all loans is ten years.

The present value of non-GDP-linked loans—if these are repaid—can be determined by a single value, since the flow of payments in the model is not subject to interest rate fluctuations (see Figure 7). Full repayment of the loans will be achieved without indexation in 87 percent of cases; there will be a debt restructuring before maturity of the ten-year repayment period in around 13 percent of cases. Indexing loans from the GLF increases the probability of full repayment by just under eight percentage points up to 95 percent (see Table 2). It would increase by another percentage point if the loans of a third financial program were also indexed. Furthermore, the simulation of the interest payments on an indexed loan shows that payments might be even higher in the event of positive economic development than in the status quo (see Figure 8).

Stabilizing the Debt Ratio

The objective agreed by the troika and Greece to reduce the debt ratio to around 128 percent of GDP by 2020 can only be achieved if the course of the Greek economy is

¹³ The percentage of indexation from GLF loans is calculated as the quotient of the amount of the loans from the GLF (52.9 billion euros) and Greece's total debt (302 billion euros). This corresponds to 18 percent.

Table 2

Default Rates of Greek Loans

In percent

	Probability of default	Change due to indexation
Without indexation	13.4	–
Indexation of GLF loans	5.5	–59
Including third program ¹	4.2	–69

¹ Third program as 12-billion-euro loan.

Source: calculations by DIW Berlin.

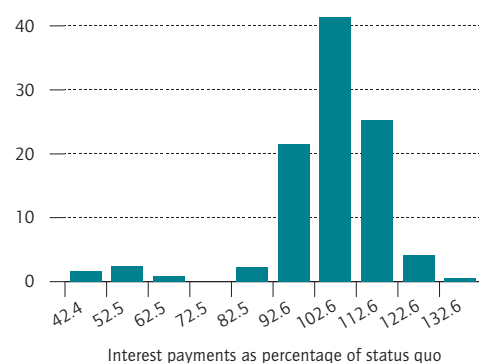
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GDP-linked loans reduce the probability of default.

Figure 8

Probability Distribution of Present Values of Simulated Repayment Profiles

In percent



Source: calculations by DIW Berlin.

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Indexation of loans might also provide opportunities for higher interest payments.

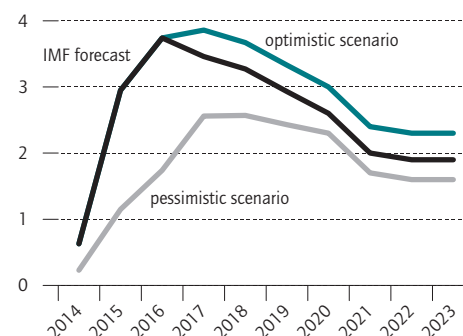
as favorable as assumed in the IMF forecast. The question therefore arises as to how the debt ratio would develop with a lower rate of economic growth in the short and medium term.

In an attempt to answer this question, two scenarios have been added to the IMF forecast (see Figure 9). In the pessimistic scenario, the growth rate is significantly weaker, particularly in the years up until 2019. In the optimis-

Figure 9

Scenarios for Greece's GDP

In percent



Source: calculations by DIW Berlin.

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The growth rate would be much weaker in the pessimistic scenario, particularly up to 2019.

tic forecast, growth of the economy from 2017 onwards is somewhat more dynamic than in the IMF forecast.¹⁴

It turns out from the simulations that the troika's objective will not be achieved in the pessimistic scenario without indexation (see Figure 10).¹⁵ Indexation, on the other hand, would bring them closer to their goal since the credit terms are automatically adjusted to economic development, although the effect is modest. Conversely, the course of the debt ratio in the optimistic scenario shows that the additional interest payments would not be particularly significant if the IMF's growth forecast is surpassed in the optimistic scenario with higher growth rates than in the baseline forecast of the IMF. Hence, even in this case Greece would not be in a disproportionately worse position than under the credit terms in the status quo.

Conclusion

There are four advantages to linking interest payments for public loans to Greece with Greek economic performance as proposed here. First, GDP-linked loans would reduce the probability of a further Greek debt restructuring by becoming insolvent. As a result, also the default risk for the German tax payer is reduced. In par-

¹⁴ All other assumptions made in the IMF forecast remain unchanged, particularly the positive development of primary surpluses.

¹⁵ The simulation of the debt level adopts the other assumptions made by the IMF, particularly the development of primary surplus.

ticular, the objective of stabilizing the Greek debt ratio could be achieved, even in weaker growth scenarios. Consequently, GDP-linked loans could make a contribution to the sustainability of Greek debt.

A second advantage of GDP-linked loans is that they would provide stronger incentives for Greece to assume responsibility for its own reforms, thus improving the chances of success. Short-term downturns would not lead to a politically costly renegotiation of credit terms but could be bridged by automatically temporarily relaxing the credit terms. As this is known *ex ante*, the resulting insurance effect for Greek policymakers would then further reduce the current political-economy barriers to reforms. Consequently, European creditors would have access to a financing structure that contributes to improve burden-sharing and is more incentive compatible than the existing non-contingent debt. Thus, the political conflict between Greece and the other euro area countries would be reduced. The troika, which is being increasingly criticized throughout Europe, would no longer have to play the dubious role of “financial inspector.”

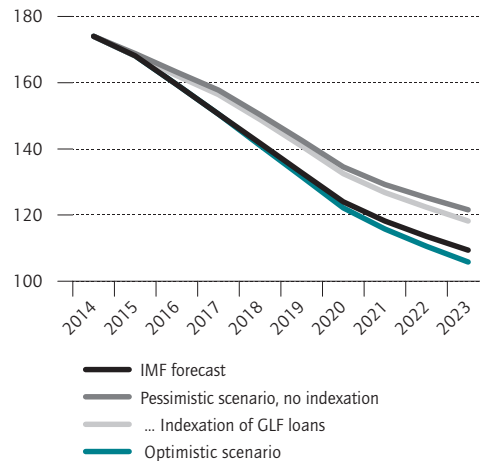
A third advantage is that GDP-linked loans would ease the burden on the Greek government in the short to medium terms through a deferral (not waiving) of interest payments if the recovery will be delayed, reduce the obligation to pursue a procyclical fiscal policy, and thus contribute to macroeconomic stabilization.

Finally, Germany and the other euro area member states would also benefit from this option. Not only would the credit risk for the German government be reduced, but in the long term, loan repayments could be higher if the Greek economy recovers more strongly and grows again. These benefits have to be contrasted with the fact that GDP-linked loans make interest payments less predictable.

For all these reasons, the instrument of GDP-linked loans is a better option—from both a European and a German perspective—than that favored by the Greek government, i.e., cutting interest rates and extending the loan terms, which would *de facto* amount to another public debt restructuring.

Figure 10

Simulated Development of Greece's Debt In percentage of GDP



Source: calculations by DIW Berlin.

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In the event of weak growth, the Greek debt level could be better stabilized by means of indexation.

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