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Contents

Call for Applications	
Visiting Research Program	4

Analyses

Austrian Economy Prevails in Bleak International Environment Economic Outlook for Austria from 2012 to 2014 (June 2012)	6
<i>Christian Ragacs, Klaus Vondra</i>	

Business Cycle Synchronization in the Euro Area and the Impact of the Financial Crisis	33
<i>Martin Gächter, Aleksandra Riedl, Doris Ritzberger-Grünwald</i>	

Analyzing Corporate Loan Growth in Austria Using Bank Lending Survey Data Conceptual Issues and Some Empirical Evidence	61
<i>Christian Beer, Walter Waschiczek</i>	

Savings Deposits in Austria – A Safety Net in Times of Crisis	81
<i>Michael Andreasch, Pirmin Fessler, Martin Schürz</i>	

Event Wrap-Ups

European Monetary Union: Lessons from the Debt Crisis Summary of the 40 th Economics Conference of the Oesterreichische Nationalbank	98
<i>Ernest Gnan, Esther Segalla</i>	

Notes

List of Studies Published in Monetary Policy & the Economy	108
Periodical Publications	111
Addresses	112

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Call for Applications: Visiting Research Program

The Oesterreichische Nationalbank (OeNB) invites applications from external researchers for participation in a Visiting Research Program established by the OeNB's Economic Analysis and Research Department. The purpose of this program is to enhance cooperation with members of academic and research institutions (preferably post-doc) who work in the fields of macroeconomics, international economics or financial economics and/or with a regional focus on Central, Eastern and Southeastern Europe.

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. Visiting researchers are expected to collaborate with the OeNB's research staff on a prespecified topic and to participate actively in the department's internal seminars and other research activities. They will be provided with accommodation on demand and will, as a rule, have access to

the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between 3 and 6 months, but timing is flexible.

Applications (in English) should include

- a curriculum vitae,
- a research proposal that motivates and clearly describes the envisaged research project,
- an indication of the period envisaged for the research visit, and
- information on previous scientific work.

Applications for 2013 should be e-mailed to

eva.gehringer-wasserbauer@oenb.at
by November 1, 2012.

Applicants will be notified of the jury's decision by mid-December. The following round of applications will close on May 1, 2013.

Analyses

Austrian Economy Prevails in Bleak International Environment

Economic Outlook for Austria from 2012 to 2014
(June 2012)

Christian Ragacs,
Klaus Vondra¹

1 Summary: Austria Ranks among Europe's Growth Engines in 2012

In its economic outlook of June 2012, the Oesterreichische Nationalbank (OeNB) projects Austrian GDP growth to reach 0.9% in 2012 and expects the Austrian economy to remain one of the engines of euro area growth also in 2013 and 2014 (2013: 1.7%; 2014: 2.1%). Against the OeNB's December 2011 outlook, the projections have been revised upward slightly for 2012 (+0.2 percentage points) and 2013 (+0.1 percentage points) despite the fiscal consolidation package adopted in spring 2012 and an internationally bleak environment. Essentially, the upward revision is due to the robust performance of the domestic economy, which is reflected in very dynamic employment growth and a pronounced investment cycle. By contrast, net exports will make only a modest contribution to growth. The unemployment rate, which stood at 4.2% in 2011, will

temporarily inch up to 4.3% in 2012 and 2013 but drop back to 4.2% in 2014. HICP inflation will fall to 1.7% by 2013, primarily owing to easing commodity price pressures, but will reaccelerate slightly in 2014 on the back of the recovering domestic economy (1.9%). The general government deficit will marginally increase to 2.8% of GDP in 2012, owing to financial stability measures, but will subsequently improve to 1.2% of GDP by 2014 for both economic and fiscal consolidation reasons. The current account, finally, will show a slight surplus over the entire forecast period and is projected to stand at 2.9% of GDP in 2014.

Global GDP growth will continue to lose steam in 2012, owing to the persistent European debt crisis and to slowing economic activity in Asian emerging markets. While long-term liquidity provided by the ECB in the form of two refinancing operations with a maturity of three years in December 2011 and

Chart 1

Real GDP Growth (Seasonally and Working Day-Adjusted)



Source: Eurostat, OeNB.

Editorial deadline:
May 24, 2012

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March 2012, as well as the haircut negotiated for the Greek government's private creditors temporarily reduced uncertainty and calmed financial markets, the latest political developments in Greece have triggered renewed uncertainty. At the same time, economic developments in the U.S.A. and in Japan came as a pleasant surprise: both economies have been growing more rapidly in 2012 than forecast by the OeNB's economic outlook of December 2011.

In *Europe* and, particularly, in the euro area, the impact of the financial and economic crisis has resulted in increasingly wider divergence between individual countries' economic performance. The further deepening of the sovereign debt crisis at end-2011, which was accompanied by a decline in global demand, has induced a recession in a number of countries in some of which it will persist until 2013. Apart from the EU-IMF program countries of Greece and Portugal, the Netherlands and above all the two large economies of Italy and Spain have been hit. By contrast, Germany, France, Austria, Finland and Slovakia are driving euro area growth, but the strength of their economies will not prevent the euro area as a whole from sliding into a mild recession in 2012.

As in 2008 and 2009, *Austria* has been unable to decouple itself entirely from world economic momentum. In the second half of 2011, export growth virtually stagnated, which meant net exports did not make a positive contribution to growth. However, unlike the crisis year of 2009, buoyant domestic demand prevented a renewed recession in the second half of 2011. In early 2012, the Austrian economy returned to positive growth, which will continue to strengthen as the expansion in international demand accelerates. In

the first quarter of 2012, the contributions to growth came from the entire spectrum of demand components. *Private consumption* growth in particular will accelerate over the forecast horizon, despite the fiscal consolidation measures, owing to record employment and an improvement in real disposable household incomes. Investment in equipment, which had fueled the investment cycle in 2011, will grow more slowly in the period from 2012 to 2014. Nonetheless, the forecast horizon will see continued above-average growth in *total gross fixed capital formation*, as construction investment will also contribute to growth following the rebound of the construction investment cycle amid the favorable financing conditions of 2011. Export growth, meanwhile, remains lackluster in historical terms, so that net exports will only marginally contribute to growth.

Robust *employment growth* of 56,700 persons (1.6%) is projected for 2012. This figure is only slightly lower than the increase in 2011 when employment had already risen very sharply (59,300 persons, or 1.7%). Employment momentum will persist in 2013 (1.0%) and 2014 (1.3%). Owing to the steep rise in employment, the *unemployment rate* (Eurostat definition) fell to 4.2% in 2011. This means Austria has the lowest unemployment rate in the euro area. In 2012, unemployment is projected to inch up to 4.3% due to slowing economic activity and a further increase in labor supply. For 2014, however, the unemployment rate is expected to revert to 4.2 % in line with the strengthening economic recovery.

HICP inflation stood at 3.6% in 2011, with core inflation up to almost 3%. Primarily in view of falling commodity prices – in particular, energy prices –

Table 1

OeNB June 2012 Outlook for Austria – Key Results¹

	2011	2012	2013	2014
Economic activity				
<i>Annual change in % (real)</i>				
Gross domestic product	+3.0	+0.9	+1.7	+2.1
Private consumption	+0.7	+1.1	+1.0	+1.3
Government consumption	+0.4	+0.4	+0.9	+0.9
Gross fixed capital formation	+5.0	+2.5	+2.5	+2.2
Exports of goods and services	+7.1	+3.4	+6.1	+6.8
Imports of goods and services	+7.5	+3.5	+5.9	+6.5
<i>% of nominal GDP</i>				
Current account balance	+1.9	+2.1	+2.6	+2.9
Contribution to real GDP growth				
<i>Percentage points</i>				
Private consumption	+0.4	+0.6	+0.5	+0.7
Government consumption	+0.1	+0.1	+0.2	+0.2
Gross fixed capital formation	+1.0	+0.5	+0.5	+0.5
Domestic demand (excluding changes in inventories)	+1.4	+1.1	+1.2	+1.3
Net exports	+0.3	+0.2	+0.5	+0.6
Changes in inventories (including statistical discrepancy)	+1.3	-0.5	+0.0	+0.2
Prices				
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+3.6	+2.4	+1.7	+1.9
Private consumption expenditure (PCE) deflator	+2.8	+2.5	+1.8	+1.9
GDP deflator	+1.9	+1.6	+1.5	+1.7
Unit labor costs in the total economy	+0.8	+3.1	+1.6	+2.0
Compensation per employee (at current prices)	+2.4	+2.4	+2.3	+2.9
Productivity (whole economy)	+1.5	-0.7	+0.7	+0.8
Compensation per employee (real)	-0.4	-0.1	+0.5	+1.0
Import prices	+5.9	+2.4	+2.0	+2.0
Export prices	+3.5	+2.3	+1.8	+1.9
Terms of trade	-2.3	-0.2	-0.2	-0.2
Income and savings				
<i>% of nominal disposable household income</i>				
Real disposable household income	-0.2	+0.8	+1.0	+2.1
<i>% of nominal disposable household income</i>				
Saving ratio	7.5	7.4	7.5	7.9
Labor market				
<i>Annual change in %</i>				
Payroll employment	+1.7	+1.6	+1.0	+1.3
<i>% of labor supply</i>				
Unemployment rate (Eurostat definition)	4.2	4.3	4.3	4.2
Budget				
<i>% of nominal GDP</i>				
Budget balance (Maastricht definition)	-2.6	-2.8	-1.6	-1.2
Government debt	72.2	74.7	74.5	73.2

Source: 2011: Eurostat, Statistics Austria; 2012 to 2014: OeNB June 2012 outlook.

¹ The outlook was drawn up on the basis of seasonally adjusted and working-day adjusted national accounts data. Therefore, the values for 2011 may deviate from the nonadjusted data released by Statistics Austria.

inflation will ease significantly in 2012 (2.4%) and 2013 (1.7%). In 2014, however, stronger GDP growth will induce a marginal, domestic demand-led increase in inflation to 1.9%.

2 Technical Assumptions

This forecast is the OeNB's contribution to the Eurosystem's June 2012 staff projections. The forecast horizon ranges from the first quarter of 2012 to the fourth quarter of 2014. May 16, 2012 was the cutoff date for the assumptions

on global growth as well as interest rates, exchange rates and crude oil prices. The OeNB used its macro-economic quarterly model to prepare the projections for Austria. The key data source comprised seasonally and working day-adjusted national accounts data computed by the Austrian Institute of Economic Research (WIFO), which were fully available to the fourth quarter of 2011. The data for the first quarter of 2012 are based on GDP flash estimates, which cover only part of the aggregates in the national accounts, however. The short-term interest rates used for the forecast horizon are based on market expectations of the three-month EURIBOR, namely 0.8% in 2012, 0.7% in 2013 and 1.0% in 2014. Long-term interest rates reflect market expectations for ten-year government bonds, and have been set at 2.9% (2012), 3.1% (2013) and 3.5% (2014). The exchange rate of the euro vis-à-vis the U.S. dollar is assumed to stay constant at USD 1.31. The projected trend in crude oil prices is based on futures prices. The oil price assumed for 2012 is USD 115.7 per barrel of Brent, while the prices for 2013 and 2014 are set at USD 109.3 and USD 103.1, respectively. The prices of commodities excluding energy are also based on futures prices over the forecast horizon.

3 Modest Decline in Global Economic Activity – European Sovereign Debt Crisis Curbs GDP Growth

In 2010, the world economy (excluding the euro area) registered above-average growth of 5.8%, thereby offsetting to some extent the slump it suffered in 2009. Conversely, 2011 was – and 2012 is – marked by a downturn in global economic activity, with growth rates of only 4.1% and 3.8%, respectively. Other factors contributing to this slow-

down include the European sovereign debt crisis and the deceleration of GDP growth in Asian and Latin American emerging markets. By contrast, favorable economic developments in the U.S.A. and in Japan will fuel world GDP growth in 2012. A trend reversal is expected for 2013: world GDP growth will increase to more than 4% in 2013 and accelerate to 4.6% in 2014. In line with global GDP growth, world trade growth will also gather momentum.

The *U.S.* economy expanded by 0.5% in the first quarter of 2012 on a quarterly basis, i.e. more rapidly than hitherto forecast. Although consumption growth – curbed by the deleveraging process and a still problematic housing market – will remain at below-average levels in 2012, an improved labor market, an incipient investment cycle and the extension of tax breaks will drive overall momentum at least until the U.S. presidential elections in fall 2012. The latter, however, are depressing growth expectations for 2013, as the necessary fiscal consolidation measures will not induce further growth. Although U.S. GDP growth is much stronger than that of the euro area, in historical terms it remains subdued.

The pace of the *Japanese* economy is still determined by the impact of two natural disasters. First, economic output stagnated in the fourth quarter of 2011 owing to the flood in Thailand, as the latter gave rise to supply-side problems and an inventory rundown. Second, the long-term consequences of the Tohoku-Pacific earthquake, as well as the tsunami unleashed by it, will necessitate a steep increase in government investment in 2012. Based on robust consumption growth and positive net exports, GDP growth of 1.0% was exceptionally strong in the first

quarter of 2012. Although unexpectedly substantial quarterly growth in early 2012 boosted the growth expectations for 2012 as a whole, economic momentum will slow over the remaining forecast period.

Unlike recent years, positive growth stimuli from emerging markets are not anticipated at present. While the slowdown in *Chinese* GDP growth to below 9% is attributable to various economic policy measures, lower construction investment and weakening export momentum, the slowdown in *Indian* GDP growth is a consequence of the loss of confidence induced by high debt levels and persistently high inflation. Both countries are currently in a soft landing phase. However, other major emerging markets such as Argentina, Korea, Mexico and Turkey also expect growth to decline in 2012 and, in some cases, by a significant margin. Except for Poland, the growth outlook in *Central, Eastern and Southeastern European (CESEE) countries* is similarly subdued. In addition to the global downturn, the factors depressing growth in some CESEE economies are, in particular, the euro area's sovereign debt crisis and the need for fiscal consolidation. The CESEE area is expected to register growth of 1.7% in 2012 and to see growth accelerate to 3.0% by 2014. Although this means growth in the region will still exceed that of the euro-area, the growth advantage has halved compared with the period from 2003 to 2008.

GDP growth in Europe and the *euro area* has become increasingly more heterogeneous in the wake of the sovereign debt crisis. The global financial and economic crisis has affected every single country in Europe. The crisis however revealed deep structural differences and significant macroeconomic imbalances, which had built up in the previous boom years. The fiscal consol-

idation efforts required as a result of the sharp increase in government budget deficits and the accompanying steep rise in the government debt ratio dampened real growth and increased unemployment. Weak international demand, which accompanied the cooling of the world economy, caused the situation to further deteriorate: the economic output of the euro area and the EU-27 contracted at end-2011. Although real GDP growth stagnated in the euro area and the EU-27 in the first quarter of 2012, some euro area countries slid back into recession in late 2011/early 2012. The Eurosystem thus expects euro area GDP to fall slightly in 2012 (when GDP growth is unlikely to exceed a range of -0.5% to $+0.3\%$) and to recover modestly in 2013 (with GDP growth likely to be within a range of 0.0% to $+2.0\%$). These projections are however based on the underlying assumption equally applicable to the current outlook for Austria that the crisis of confidence is gradually abating, a return to "normality" is taking place and the European sovereign debt crisis is being resolved, without any further negative shocks arising.

The divergence in euro area GDP growth is particularly evident in the growth prospects of the region's four major economies. The *German* economy, while suffering from sluggish demand within Europe, is benefiting from its strong position in global export markets. Exports are nonetheless growing more slowly than imports. Unlike previous years, German growth is being fueled by domestic demand. With growth of 0.5% in the first quarter of 2012, Germany has been among the fastest-growing economies in Europe. Even if the German economy does not continue to grow at the rate it did in 2010 and 2011, the OECD anticipates German GDP growth will exceed 1% in

2012, which means it will have a significant growth advantage within Europe. The outlook for *France* assumes modest GDP growth in 2012. The French economy stagnated in the previous six months, and future growth will be extremely subdued. A renewed recession has so far been avoided, however. France has benefited from above-average domestic demand, which will continue to grow fairly robustly in 2012. By contrast, the three next-largest economies in the euro area face a renewed recession in 2012. *Italy* has been in recession since mid-2011. Substantial fiscal adjustment measures will dampen domestic demand in 2012. In addition, the *Spanish* economy is contracting as a result of the bursting of the housing bubble, high unemployment of almost 25% and the need for both private and public sector deleveraging. Spain is therefore expected

to be in recession in 2012 and 2013 and return to growth only in 2014. The *Netherlands* will also suffer a contraction in economic output in 2012, although the slump will not be as severe as in Italy and Spain.

Of the EU-IMF program countries, Greece and Portugal are still struggling with huge problems whereas Ireland appears to have managed to turn around its economy. Thanks to its excellent competitive situation and resurgent exports, Ireland can expect positive GDP growth in 2012.

4 Austrian Economy Prevails in Bleak International Environment

Austria was still marked by stable consumer demand and a pronounced investment cycle in the second half of 2011. Stagnating economic output in

Table 2

Underlying Global Economic Conditions

	2011	2012	2013	2014
<i>Annual change in % (real)</i>				
Gross domestic product				
World GDP growth outside the euro area	+4.1	+3.8	+4.3	+4.6
U.S.A.	+1.7	+2.2	+2.2	+2.8
Japan	-0.7	+2.2	+1.7	+1.6
Asia excluding Japan	+7.2	+6.5	+7.3	+7.5
Latin America	+4.5	+3.1	+3.8	+4.1
United Kingdom	+0.7	+0.4	+2.0	+2.1
New EU Member States ¹	+3.2	+1.7	+2.3	+3.0
Switzerland	+1.9	+0.9	+1.6	+1.8
Euro area ²	+1.5	-0.5 to +0.3	0.0 to +2.0	x
World trade (imports of goods and services)				
World economy	+6.1	+4.4	+6.4	+7.2
Non-euro area countries	+6.9	+5.5	+7.3	+8.0
Real growth of euro area export markets	+6.3	+4.0	+6.4	+7.2
Real growth of Austrian export markets	+6.1	+3.1	+6.1	+6.5
Prices				
Oil price in USD/barrel (Brent)	111.0	115.7	109.3	103.1
Three-month interest rate in %	1.4	0.8	0.7	1.0
Long-term interest rate in %	3.3	2.9	3.1	3.5
USD/EUR exchange rate	1.39	1.31	1.31	1.31
Nominal effective exchange rate (euro area index)	103.39	98.95	98.70	98.70

Source: Eurosystem.

¹ Bulgaria, Czech Republic, Hungary, Latvia, Lithuania, Poland and Romania.

² 2012 to 2014: Results of the Eurosystem's June 2012 projections. The ECB publishes the projections as ranges based on historical forecast errors.

the third and fourth quarter of 2011 was therefore primarily a consequence of the European sovereign debt crisis and the accompanying weakening of export demand. According to the current GDP flash estimate, however, the Austrian economy resumed growth in the first quarter of 2012 (0.2%). This growth was fueled by both domestic and external demand, making Austria one of the pillars of growth in the euro area in early 2012 – alongside Germany, Belgium and Slovakia.

Since the OeNB December 2011 outlook, no major global shocks have occurred that would not have already been factored in at the time. Both the latter outlook and the current one assume that Europe's crisis of confi-

dence is gradually abating and that conditions are “normalizing” in Austria as well as in the euro area. However, this return to “normality” does not at all signify a steady path to recovery. This phenomenon is reflected in the latest trend in various confidence indicators for April 2012, which is marked by increased vigilance. In view of stabilizing global demand over the forecast horizon, a return to long-term average growth rates is anticipated, however. Unlike the December 2011 outlook, the budget consolidation approved in spring 2012, which is intended to reduce the structural budget balance to –0.45% by 2017, was included in the current outlook's basic scenario (box 1).

Box 1

Development of Public Finances from 2011 to 2014¹

In 2011, the general government deficit narrowed to 2.6% of GDP (2010: 4.5%). Owing to various tax increases implemented under the fiscal consolidation package of fall 2010 and, particularly, to excellent growth in personal and corporate income taxes due to the healthy economy, government revenues rose by 4.7%. By contrast, the increase in government expenditure was extremely modest, amounting to a mere 1% owing to low growth in monetary social benefits (low pension settlements, cut in social transfers to families), staff costs (low wage settlements) and discretionary spending, among other factors.

Despite this significant improvement in the budget balance in 2011, further fiscal consolidation measures are necessary, as Austria has to correct its excessive deficit and put it on a sustainable basis by 2013 at the latest and, owing to the “debt brake” adopted at end-2011, to achieve a structurally almost balanced budget by 2017.² This is why the Austrian federal government passed a second package of fiscal consolidation measures in early 2012. The

Impact of (Specified) Consolidation Measures

	Volume			GDP			Budget balance		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
	% of GDP			Annual change in %			% of GDP		
Scenario excluding consolidation				0.9	2.0	2.3	–3.1	–2.4	–2.0
Overall impact of consolidation	0.4	1.0	1.1	–0.1	–0.3	–0.2	0.4	0.8	0.8
OeNB forecast				0.9	1.7	2.1	–2.8	–1.6	–1.2

Source: Austrian Federal Ministry of Finance (BMF), OeNB.

¹ Compiled by Lukas Reiss, Economic Analysis Division, lukas.reiss@oenb.at.

² The requirements stipulated under the preventive arm of the Stability and Growth Pact are fairly similar.

revenue-increasing measures primarily consist in increasing social contributions, taxation of realized capital gains from the sale of real estate, closing tax loopholes related to VAT and two sizeable one-off measures (tax agreement with Switzerland, frontloaded taxation of certain pension fund benefits). The spending-restraint measures comprise cuts in staff costs (in particular, a public-sector wage freeze in 2013), smaller pension increases in 2013 and 2014 (adjustment factor reduced by 1 percentage point and 0.8 percentage points respectively), measures to raise the effective retirement age, as well as the reduction in various government grants (subsidies for Federal Railways of Austria, integration of public investment subsidies to avoid duplication (“Förderpyramide”), etc.) and (so far still unspecified) savings by federal provinces, municipalities and social security institutions.

The table above shows the estimated macroeconomic effects of those fiscal consolidation measures that have been specified in detail. The impact on GDP growth is relatively small because some of the measures included do not have a knock-on effect (frontloaded taxation of certain pension fund benefits,³ tax agreement with Switzerland) or, if they do, have a rather mild one. The latter also applies to the moves to close tax loopholes, to reductions in tax exemptions and to the increase in taxation of labor income (as these measures primarily concern high-income earners).

In addition to these fiscal consolidation measures, the non-indexation of wage and income tax brackets (“bracket creep”),⁴ and various social transfers (family benefits, long-term-care allowance) and assumed low discretionary spending growth are expected to keep the budget deficit from rising more than a fraction beyond 1% of GDP in 2014 (these factors are however not included in the table above).

However, the development of both deficit and debt over the forecast horizon is also influenced by two extraordinary factors: support to the financial sector in Austria (“bank stabilization package”), as well as measures implemented within the framework of crisis management in the euro area. The following table⁵ shows that the impact of the bank stabilization package

Impact of Austrian Bank Stabilization Package and Euro Area Crisis Management

		2008	2009	2010	2011	2012
Austrian bank stabilization package		% of GDP				
Gross savings ¹	A	0.0	0.0	0.1	0.1	0.1
Capital transfers	B	0.0	0.0	0.6	0.2	0.8
Stock-flow adjustment ²	C	0.3	1.7	0.0	-0.2	-0.2
Budget balance	A-B	0.0	-0.0	-0.5	-0.1	-0.7
Debt ratio (direct) ³	$\sum(B+C)$	0.3	2.1	2.6	2.5	3.0
Debt ratio (total) ⁴	$\sum(B+C-A)$	0.3	2.1	2.4	2.2	2.6
Euro area crisis management⁵						
Budget balance		x	x	0.0	0.0	0.0
Debt		x	x	0.2	0.7	2.3

Source: OeNB, Statistics Austria, Eurostat, ECB.

¹ Dividends + premiums – guarantee fees.

² Factors influencing only the deficit level (reduction of participation capital) or only the debt level (e.g. private bank equity).

³ Cumulative. Corresponds to the Eurostat table relating to the Austrian bank stabilization package.

⁴ Cumulative. Includes impact of current balance on debt ratio.

⁵ Bilateral loans, EFSF loans, contributions to ESM.

³ However, frontloaded taxation of pension fund benefits only appears to be making a contribution to fiscal consolidation. In actual fact it worsens the sustainability of public finances (slightly), as the one-off reduction in the budget deficit is more than offset by higher budget deficits in the future.

⁴ Compared with 2011, the nonindexation of wage and income tax brackets will generate additional revenue of almost 0.5% of GDP in 2014. The dampening effect of the nonadjustment of nominally fixed excise duties (particularly, the tax on hydrocarbon fuels) on revenue growth is relatively smaller.

⁵ This table only shows values up to and including 2012, as uncertainty about numbers going forward is relatively high.

on the budget balance was and is significant in 2010 and 2012 respectively (and therefore also strongly influenced changes in the budget balance in 2011 and will do so in 2013). Although the direct impact of crisis management measures on the budget balance is currently minimal, they will contribute to the projected increase in Austria's government debt ratio especially in 2012 (particularly, via the second Greek bailout package).

4.1 Exports Suffer From European Crises of Confidence and Debt

After Austrian exports benefited from significant catch-up effects in 2010 following the economic crisis in 2009, their momentum slowed markedly during 2011. The enduring sovereign debt crisis in Europe, increased saving efforts, slackening growth and rising unemployment in many countries ultimately led to a drop in demand for Austrian export products. Furthermore, weaker euro area demand was not offset by growing demand from countries outside the euro area, as the CESEE economies and Switzerland were affected by the euro area's problems as well. However, the slumps in demand within the euro area were considerably more pronounced. The Austrian goods and service sector almost stagnated in the second half of 2011.

According to the baseline scenario, the underlying reasons for current weak demand within Europe should gradually disappear over the forecast horizon, given the far-reaching adjustment processes. Together with a revival in international economic activity, this development should result in an appreciable pick-up in exports. However, exports will continue to grow very modestly in 2012 as a whole (3.4%), only gathering momentum in 2013 (6.1%) and 2014 (6.8%).

Owing to buoyant investment activity, 2011 saw imports (7.5%) growing faster than exports (7.1 %). In 2012, the investment cycle that is winding down, as well as low export levels, will slow import growth, which will not pick up pace until 2013 and 2014.

The slide in exports in 2008 and 2009 is also reflected in Austria's

Table 3

Growth and Price Developments in Austria's Foreign Trade

	2011	2012	2013	2014
<i>Annual change in %</i>				
Exports				
Competitor prices in Austria's export markets	+4.1	+3.4	+1.8	+1.7
Export deflator	+3.5	+2.3	+1.8	+1.9
Changes in price competitiveness	+0.6	+1.1	+0.0	-0.2
Import demand in Austria's export markets (real)	+6.1	+3.1	+6.1	+6.5
Austrian exports of goods and services (real)	+7.1	+3.4	+6.1	+6.8
Austrian market share	+1.1	+0.4	+0.0	+0.2
Imports				
International competitor prices in the Austrian market	+3.8	+2.6	+1.9	+1.8
Import deflator	+5.9	+2.4	+2.0	+2.0
Austrian imports of goods and services (real)	+7.5	+3.5	+5.9	+6.5
Terms of trade	-2.3	-0.2	-0.2	-0.2
<i>Percentage points of real GDP</i>				
Contribution of net exports to GDP growth	+0.3	+0.2	+0.5	+0.6

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook, Eurosystem.

Table 4

Austria's Current Account

	2011	2012	2013	2014
	% of nominal GDP			
Balance of trade	2.3	2.2	2.8	3.2
Balance on goods	-2.3	-1.7	-1.2	-0.6
Balance on services	4.7	3.9	4.0	3.8
Balance on income	0.3	0.2	0.1	0.1
Balance on current transfers	-0.7	-0.3	-0.3	-0.4
Current account	1.9	2.1	2.6	2.9

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

current account. After the current account balance's steady improvement since the mid-1990s and its positive balance since 2001, the global financial and economic crisis reduced it from its peak in 2008 (4.9%) to its 2004 and 2005 level. Sluggish export growth in 2012 means Austria's current account surplus of some 2.1% of GDP will exceed the 2011 level only by a small margin. From 2013, the current account will improve again more markedly.

4.2 Investment Provides Considerable Growth Impetus

Gross fixed capital formation suffered a huge slump in 2009 and stagnated in 2010. The ensuing backlog, particularly in investment in equipment which had shrunk sharply in 2008 and 2009, was met by the latter's extraordinary growth in 2011. Gross fixed capital formation grew by 5.0% – as high as last seen in 1996 – and investment in equipment expanded by as much as

Table 5

Investment Activity in Austria

	2011	2012	2013	2014
	Annual change in %			
Total gross fixed capital formation	+5.0	+2.5	+2.5	+2.2
<i>of which: Investment in plant and equipment</i>	+9.3	+4.9	+4.1	+3.2
Residential construction investment	+0.8	+1.7	+1.8	+1.6
Nonresidential construction investment and other investment	+1.2	+0.6	+1.2	+1.4
Government investment	-8.5	+0.5	+0.5	+0.5
Private investment	+5.8	+2.5	+2.6	+2.3
	Contribution to total gross fixed capital formation growth in percentage points			
Investment in plant and equipment	+3.7	+2.0	+1.8	+1.4
Residential construction investment	+0.2	+0.3	+0.3	+0.3
Nonresidential construction investment and other investment	+0.5	+0.3	+0.5	+0.5
Government investment	-0.5	+0.0	+0.1	+0.0
Private investment	+5.4	+2.4	+2.5	+2.2
	Contribution to real GDP growth in percentage points			
Inventory changes	+1.2	-0.3	+0.0	+0.2

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

9.3%, thereby registering its strongest annual growth in the past few decades. This catch-up process is due to several factors: (1) replacement investment was necessary after two years of contracting investment in equipment, (2) the benign economic situation which is reflected in above-average capacity utilization and full order books, (3) enterprises' favorable internal financing situation as well as (4) external financing costs which were historically low despite the crisis.

Although the equipment investment cycle will slowly weaken in the forecast period on the back of decelerating international GDP growth since mid-2011 and extensive replacement investment, annual growth should nonetheless reach 4.9% in 2012 and 3.2% in 2014 in view of continued excellent internal financing potential. Gross fixed capital formation is also being sustained by resurgent housing investment against the backdrop of a housing investment cycle that has traditionally spanned several years in Austria. Housing investment started to expand again by a modest 0.8% in 2011 and should grow at an annual rate of more than 1.5% over the forecast

horizon, being driven by rising house prices and internationally very low interest rates in the medium term. Growth in civil engineering investment will be very sluggish in 2012 owing to lackluster public sector demand, yet it is expected to accelerate at a slightly faster tempo in both 2013 and 2014. As for government investment, the consequences of the fiscal adjustment requirements are clearly evident: government investment will increase by only 0.5% per year in real terms over the forecast horizon. However, government investment accounts for only some 5% of total investment, which will grow by 2.5% (2012 and 2013) and by 2.2% (2014).

4.3 Continued Modest Consumer Growth

Low growth in real private consumption demand in 2011 (0.7%) was primarily attributable to extraordinarily high HICP inflation and an accompanying contraction in real disposable income (−0.2%). A sharp increase in the total wage bill, which is currently being fueled by high employment growth (for further details, see section 5) and

Table 6

Determinants of Nominal Household Income in Austria

	2011	2012	2013	2014
<i>Annual change in %</i>				
Payroll employment	+1.7	+1.6	+1.0	+1.3
Wages per employee	+2.4	+2.4	+2.3	+2.9
Compensation of employees	+4.1	+4.0	+3.4	+4.3
Property income	−2.5	−2.6	+1.0	+1.5
Mixed income and operating surplus, net	+5.3	+1.9	+2.7	+2.9
<i>Contribution to disposable household income growth in percentage points</i>				
Compensation of employees	+3.5	+3.4	+2.9	+3.7
Investment income	−0.2	−0.2	+0.1	+0.1
Mixed income and operating surplus, net	+1.1	+0.4	+0.6	+0.6
Net transfers minus direct taxes ¹	−2.1	−1.2	−0.9	−0.2
Disposable household income (nominal)	+2.6	+3.3	+2.9	+4.1

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

¹ Negative values indicate an increase in (negative) net transfers minus direct taxes, positive values indicate a decrease.

comparatively high wage settlements (3.3%), is anticipated in 2012. The latter should be seen as a reaction to unexpectedly steep inflation and the healthy corporate profit situation in 2011. However, a cyclically negative wage drift is dampening wage growth, as the need to work overtime has fallen sharply compared with the boom year of 2011. Despite the weak economy, this means wages per employee will rise steeply in 2012 (2.4%). In line with the recovering economy, wages per employee will continue to climb until 2014 (2.9%). Although property income will contract in 2012 (−2.6%), it will recover in 2013 and accelerate to 1.5% by 2014. Mixed income and operating surplus will be dampened by the tough economic climate and recover only from 2013 onward.

Compared with 2011 (2.6%), nominal household income growth will be slightly higher in 2012 (3.3%) and 2013 (2.9%). In 2014, it will climb steeply to just above 4% on the back of the economic recovery. From 2012, lower inflation will spur a rise in real disposable household income after the latter fell in 2011. At an almost constant saving ratio of some 7.5% in 2012 and 2013 and at a slightly higher one of 7.9% in 2014, private consumption growth – despite fiscal consolidation efforts – will accelerate slightly from 0.7% (2011) to 1.3% (2014).

5 Robust Employment Growth in 2012, Only Slight Temporary Rise in Jobless Rate

During the 2009 recession, Austrian employment fell only slightly in both international and historical terms and, in the subsequent upturn, registered unexpectedly high growth, which has since continued to persist. Historically above-average employment growth in terms of aggregate employment is also projected for 2012 (1.6%). (See Box 2 for a more detailed analysis of these “unexpected” developments.) In 2013, employment momentum is expected to normalize to average growth levels of 1.0% but 2014 should see a slight acceleration to 1.3% for cyclical reasons. Owing to the fiscal consolidation measures, growth in public-sector employment will slow over the entire forecast period.

Following robust growth in 2011 (1.2%) labor supply growth will climb to 1.7% in 2012 but slacken during the year and decelerate to 1.0% in 2013. The reasons for this phenomenon are twofold: first, the fading impact from the opening of the Austrian labor market to workers from the CESEE economies that joined the EU in 2004 and, second, the effects of the slowing economy on Austria’s labor supply which traditionally develops in a very procyclical way. Labor supply growth is therefore expected to reaccelerate in 2014.

Table 7

Private Consumption in Austria

	2011	2012	2013	2014
<i>Annual change in %</i>				
Disposable household income (nominal)	+2.6	+3.3	+2.9	+4.1
Private consumption expenditure (PCE) deflator	+2.8	+2.5	+1.8	+1.9
Disposable household income (real)	−0.2	+0.8	+1.0	+2.1
Private consumption (real)	+0.7	+1.1	+1.0	+1.3
<i>% of nominal disposable household income</i>				
Saving ratio	7.5	7.4	7.5	7.9

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Table 8

Labor Market Developments in Austria

	2011	2012	2013	2014
Annual change in %				
Total employment	+1.5	+1.6	+1.0	+1.3
of which: Payroll employment	+1.7	+1.6	+1.0	+1.3
Self-employment	+0.2	+1.5	+0.7	+1.2
Public sector employment	-0.3	-0.1	-0.1	-0.1
Registered unemployment	-5.2	+4.5	+1.4	-0.7
Labor supply	+1.2	+1.7	+1.0	+1.2
% of labor supply				
Unemployment rate (Eurostat definition)	4.2	4.3	4.3	4.2

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Austria has had the lowest unemployment rate in the EU since mid-2011 (full year 2011: 4.2%). In 2012, the unemployment rate, in the wake of slowing growth and still rapidly expanding

labor supply, will temporarily creep up to 4.3%. In 2014, however, it will drop back to 4.2% in line with the economic recovery.

Box 2

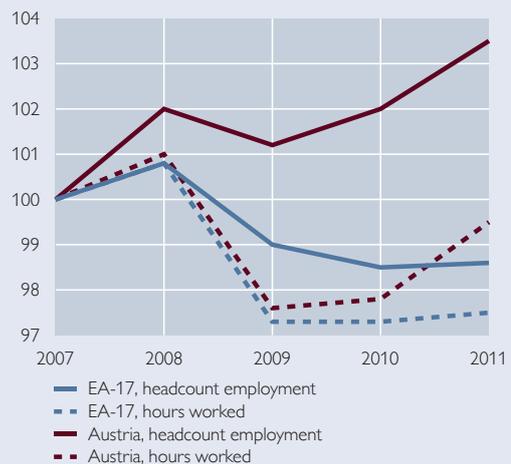
Robust Employment Growth and Working Hour Adjustments Fuel GDP Growth – Shift in Employment from Manufacturing to the Service Sector

The Austrian economy is currently marked by very dynamic employment growth, which comes rather as a surprise given that GDP growth stagnated in the second half of 2011. In 2011, growth in aggregate employment (payroll employment) stood at 1.5% (1.7%). In the first quarter of 2012, it further accelerated to 1.7% (1.8%) on a quarterly basis. In addition to the buoyant economy and Austrian enterprises' favorable financing conditions, the opening of the Austrian labor market, in May 2011, to workers from the CESEE countries that had joined the EU in 2004 also influenced employment growth. The latter was driven by labor shortages in specific sectors, a better mix of skills and a comparatively small increase in wages and thus labor costs. However, statistical distortions via potential legalizations of existing jobs are also feasible.

Even before Austria's labor market opened up to the workers from the CESEE countries that had joined the EU in 2004, employment per capita – as well as unemployment – developed positively in international terms. Employment growth returned to precrisis levels in 2010 as it rebounded to 0.9% that year. Since then, continuing momentum in 2011 and 2012 has generated an all-time employment high in Austria.

Headcount Employment and Hours Worked

Index 2007 = 100



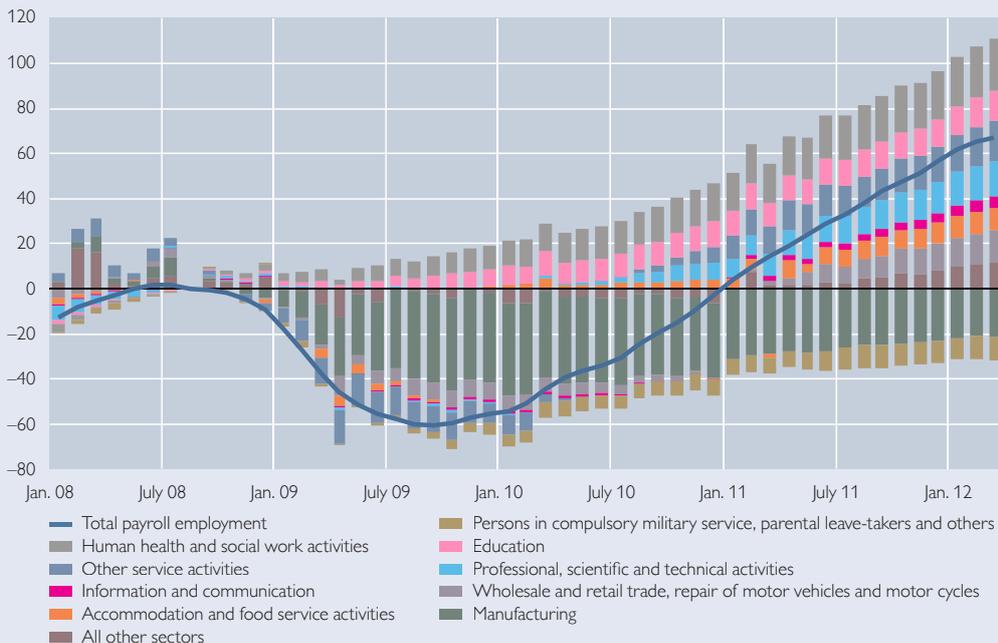
Source: National accounts data on employment, Eurostat, authors' calculations.

By contrast, employment in the euro area has still not returned to its 2007 level. In 2011, however, the euro area – after two years of shrinking employment – registered at least modest employment growth. Unlike other countries, active labor market measures caused the number of hours worked to be adjusted far more flexibly in Austria than headcount employment. The adjustments in hours worked helped to keep unemployment low and maintain corporate human capital during the crisis. At the same time, the number of hours worked, while rising significantly more sharply than in the euro area in 2011, continues to lag behind its 2007 level in Austria. The divergent development of headcount employment and hours worked is due to three factors: (1) less recourse to overtime and time quotas, (2) a trend in increased part-time work¹ and (3) a shift from manufacturing to the services industry, as is evident from an analysis of employment growth by economic sector.

The following chart shows employment growth by NACE economic sectors compared with August 2008. The data source comprises seasonally-adjusted values for the number of jobs (Main Association of Austrian Social Security Institutions). August 2008 was selected as a reference value because it represents the peak in precrisis employment.

Employment Classified By NACE Sectors

Absolute change on August 2008 measured in thousands of jobs, seasonally adjusted



Source: Economic activities according to the Main Association of Austrian Social Security Institutions, authors' calculations.

The sectoral employment trends indicate that the negative impact of the financial and economic crisis in 2008 and 2009 on employment was largely limited to manufacturing and did not spill over onto the service sector. By early 2010, Austrian manufacturing jobs had declined by almost 43,000, despite a reduction in working hours as well as considerable use of short-time working options.² Strictly speaking, the decrease in employment in the “Other

¹ The provisions governing phased retirement were amended in 2009. The current trend shows pronounced employment growth in the over 55 year-old age group. In addition, the Austrian female employment rate, which also shows a marked trend in part-time work, has been on the rise for years.

² More than 30,000 persons were registered as engaged in short-time working between March 2009 and January 2010. The peak was reached in June 2009, with 56,860 persons on short-term work at 321 firms (mainly large industrial enterprises, owing to the administrative burden).

service activities” sector (some 15,000 leased employees) also qualifies as a decrease in manufacturing jobs. While the number of leased employees returned to precrisis levels in summer 2010 and even exceeded this figure by some 17,000 persons in early 2012, manufacturing employment was still markedly below precrisis levels at the start of 2012. As manufacturing has now almost returned to precrisis levels, this would imply significant efficiency gains. The sectoral analysis of employment also reveals a shift from manufacturing to a number of service industries. In this respect, employment growth in particular in “Human health and social work activities,” “Accommodation and food service activities” and “Wholesale and retail trade, repair of motor vehicles and motor cycles” evidently reflects the full opening of the Austrian labor market to workers from EU CESEE countries.

6 Inflation Drops to below 2%

Food and energy prices soared sharply in early 2011 and service prices rose markedly in the remaining course of the year. In the full year 2011, HICP inflation stood at 3.6%, with core inflation up to almost 3%. Since December 2011, HICP inflation has been easing significantly on an annual basis. Whereas it was 3.9% in November 2011, by April 2012 it had fallen by 1.6 percentage points to 2.3%. In particular, the core components industrial goods and food as well as, to a lesser extent, energy contributed to

the fall in inflation. As a result, core inflation also eased to just above 2% in April 2012.

Owing primarily to falling commodity prices – particularly, energy prices – HICP inflation will drop to 2.4% in 2012 and further to 1.7% in 2013. The public sector, i.e. administered prices and the effects of any tax increases, will make a constant contribution to inflation. In 2014, accelerating GDP growth will induce a modest domestic demand-led uptick in inflation to 1.9%.

Table 9

Selected Price and Cost Indicators for Austria

	2011	2012	2013	2014
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+3.6	+2.4	+1.7	+1.9
HICP energy	+11.3	+4.6	+0.8	+1.1
HICP excluding energy	+2.8	+2.0	+1.8	+2.0
Private consumption expenditure (PCE) deflator	+2.8	+2.5	+1.8	+1.9
Investment deflator	+2.6	+1.9	+2.0	+2.1
Import deflator	+5.9	+2.4	+2.0	+2.0
Export deflator	+3.5	+2.3	+1.8	+1.9
Terms of trade	-2.3	-0.2	-0.2	-0.2
GDP at factor cost deflator	+1.9	+1.7	+1.8	+2.1
Unit labor costs	+0.8	+3.1	+1.6	+2.0
Compensation per employee	+2.4	+2.4	+2.3	+2.9
Labor productivity	+1.5	-0.7	+0.7	+0.8
Collectively agreed wage settlements	+2.0	+3.3	+2.4	+2.6
Profit margins ¹	+1.1	-1.5	+0.2	+0.0

Source: 2011: Eurostat, Statistics Austria; 2012 to 2014: OeNB June 2012 outlook.

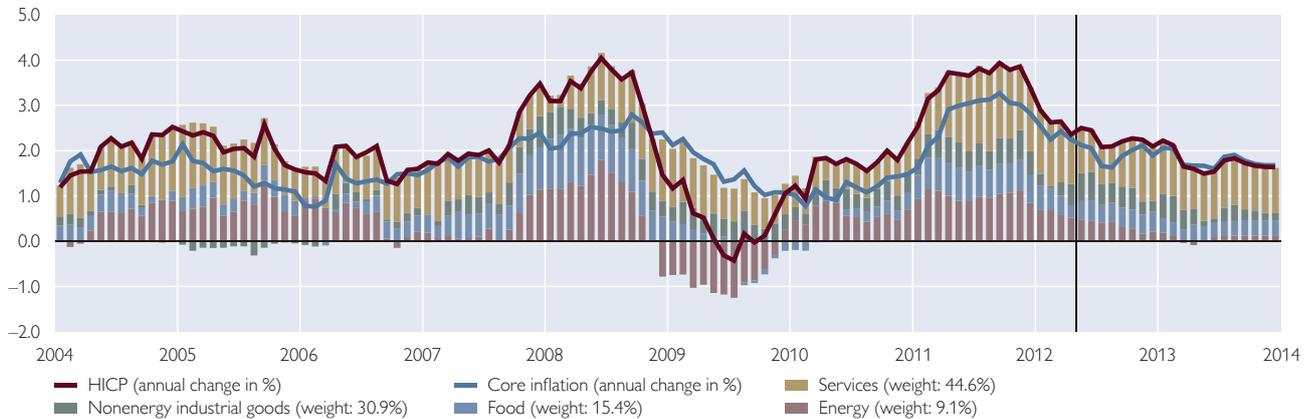
¹ GDP deflator divided by unit labor costs.

Chart 2

HICP Inflation and Contributions from Subcomponents

Contributions to growth in percentage points

Last observation: April 2012



Source: OeNB, Statistics Austria.

7 External Downside Risks Outweigh Domestic Upside Risks

The crisis in the euro area notwithstanding, the balance of domestic risks to GDP growth in Austria is slightly on the upside. Continued robust employment growth could further strengthen the total wage bill and thus disposable income, triggering an upward revision of private consumption at a constant saving ratio. As for gross fixed capital formation, it is also subject to upside risk arising in respect of two factors: first, fixed capital formation owing to Austrian companies' healthy financial coffers and, second, housing investment, whose cycle – equally fueled by favorable financing conditions – may be more robust than projected.

In contrast, the balance of external risks to GDP growth is clearly on the downside. The current developments represent a high risk to the financial sector and, consequently, to real GDP growth. The impact on Austria as a euro area member would be even more massive, should other countries get more deeply entangled in the sovereign debt and banking crisis as a result of the Greek crisis. By contrast, recent unex-

pectedly strong GDP growth in Germany represents an upside risk.

The fall in crude oil prices since the editorial deadline (May 24, 2012) represents an upside risk to the further development of the economy and a downside risk to inflation. The weaker euro exchange rate is having a stimulating effect on the economy and at the same time represents an upside risk to inflation.

8 Forecast Revised against December 2011 Primarily owing to Lower Interest Rates

The underlying assumptions on the growth of global trade have been revised downward since the OeNB's December 2011 economic outlook. For 2012 (2013), we have lowered our growth expectations for Austria's export markets by 1.3 (0.3) percentage points. Crude oil futures prices went up marginally (USD per barrel of Brent, 2013: USD +5.3). The exchange rate of the euro against the U.S. dollar has moved only little. The nominal effective exchange rate is 1.2 percentage points higher than projected in December 2011 and is almost unchanged for 2013.

Table 10

Change in the External Economic Conditions since the OeNB December 2011 Outlook

	June 2012		December 2011		Difference	
	2012	2013	2012	2013	2012	2013
<i>Annual change in %</i>						
Growth of Austria's export markets	+3.1	+6.1	+4.4	+6.4	-1.3	-0.3
Competitor prices in Austria's export markets	+3.4	+1.8	+1.3	+1.4	+2.1	+0.4
Competitor prices in Austria's import markets	+2.6	+1.9	+1.0	+1.4	+1.6	+0.5
<i>USD per barrel (Brent)</i>						
Oil price	115.7	109.3	109.4	104.0	+6.3	+5.3
<i>Annual change in %</i>						
Nominal effective exchange rate (exports)	+1.1	+0.1	-0.1	+0.0	+1.2	+0.1
Nominal effective exchange rate (imports)	+0.6	+0.1	-0.2	+0.0	+0.8	+0.1
%						
Three-month interest rate	0.8	0.7	1.2	1.4	-0.4	-0.7
Long-term interest rate	2.9	3.1	3.8	4.1	-0.9	-1.0
<i>Annual change in %</i>						
U.S. GDP (real)	+2.2	+2.2	+1.8	+2.5	+0.4	-0.3
<i>USD/EUR</i>						
USD/EUR exchange rate	1.31	1.31	1.36	1.36	-0.05	-0.05

Source: Eurosystem.

Both long-term and short-term interest rates are much lower than pegged in the December forecast. Short-term interest rates will be a mere 0.8% (-0.4 percentage points) in 2012 and 0.7% (-0.7 percentage points) in 2013. Long-term interest rates will fall more

sharply (2012: 2.9%, or -0.9 percentage points; 2013: 3.1%, or -1.0 percentage points).

The effects of these new external assumptions were simulated using the OeNB macroeconomic model. Table 11 lists the reasons for revising the out-

Table 11

Breakdown of Forecast Revisions

	GDP		HICP	
	2012	2013	2012	2013
<i>Annual change in %</i>				
June 2012 outlook	+0.9	+1.7	+2.4	+1.7
December 2011 outlook	+0.7	+1.6	+2.2	+1.6
Difference	+0.2	+0.1	+0.2	+0.1
<i>Percentage points</i>				
Due to:				
External assumptions	+0.2	+0.2	+0.1	+0.1
New data	+0.0	+0.0	+0.1	+0.0
of which: Revision of historical data until Q3 11	-0.1	+0.0	+0.0	x
Projection errors for Q4 11 and Q1 12	+0.1	+0.0	+0.1	x
Other ¹	+0.0	+0.0	+0.0	+0.0

Source: OeNB June 2012 and December 2011 outlooks.

¹ Different assumptions about trends in domestic variables such as wages, government consumption, effects of tax measures, other changes in assessment and model changes.

look in detail. Apart from the impact of changed external assumptions, they are attributable to the impact of new data and to a residual. The influence of new data includes the effects of the revisions of both the historical data already available at the time of the previous economic outlook (i.e. data up to the third quarter of 2011) and the forecasting errors of the previous outlook for the periods now published for the first time (i.e. data for the fourth quarter of 2011 and the first quarter of 2012). The item “Other” includes new expert opinions regarding the development of domestic variables, such as

government consumption or wage settlements, as well as any changes to the model.

Owing to considerably lower interest rate assumptions, projected GDP growth for both 2012 and 2013 is higher than the OeNB December 2011 outlook. In addition, unexpectedly higher employment growth in the first quarter of 2012 and the unexpectedly robust investment cycle influenced the forecast for total wage bills, consumption and investment. The modest upward revisions of the inflation forecast for both 2012 and 2013 are primarily due to new energy prices.

OeNB-BOFIT Outlook for Selected CESEE Countries: Mixed External Environment Compounds Weak Domestic Demand^{1, 2}

The CESEE-7 region posted rather strong GDP growth in 2011, but in 2012 will be affected by lower economic activity in the euro area. Despite some signs of stabilization both globally and in the euro area, the weaker external environment will halve economic growth in the region to 1.4% in 2012 from the rather strong performance in 2011. In 2013, growth will pick up to 2.6% amid a stabilizing external environment. Although the contribution of net exports to growth will shrink in all countries, external demand will continue to contribute positively to GDP growth almost everywhere in the region. Domestic demand will remain subdued in 2012 and will show only moderate signs of improvement in 2013. Given continued fiscal consolidation, no growth impetus can be expected from public consumption. Tight financing conditions and weak labor markets are hampering the recovery in private consumption and gross fixed capital formation, with individual growth prospects remaining diversified. CESEE-7 imports will expand by a modest 3.4% in 2012 and import growth will accelerate slightly to 5.7% in 2013. GDP growth in Russia is forecast to moderate to 3.7% both in 2012 and 2013, driven by reverting crude oil price dynamics, while the import expansion is expected to average around 7% p.a. in the forecast period, reflecting lower post-crisis GDP growth. Croatia is forecast to slide into recession again in 2012 (–0.9%), but GDP growth is expected to recover to 1.3% in 2013, backed by recovering domestic demand.

Risks to these projections remain tilted to the downside, mainly because the development of the euro area periphery is uncertain. However, better than expected economic developments in Germany in response to increased global trade growth represent an upside risk.

GDP and Import Projections for 2012 to 2013

	GDP			Imports		
	2011	2012	2013	2011	2012	2013
	Annual growth in %					
CESEE-7	3.2	1.4	2.6	7.6	3.4	5.7
Bulgaria	2.1	1.3	2.4	8.7	4.5	7.0
Czech Republic	1.7	0.3	1.9	7.5	2.3	6.3
Hungary	1.7	–0.5	1.2	6.3	3.0	5.4
Poland	4.4	2.4	3.1	6.0	3.4	5.0
Romania	2.1	1.2	2.6	11.2	3.4	5.8
Croatia	0.3	–0.9	1.3	–6.5	0.5	4.9
Russia	4.3	3.7	3.7	22.0	8.0	6.0

Source: OeNB-BOFIT March 2012 forecast, Eurostat, Rosstat.

Note: CESEE-7 = CESEE EU member countries that have not yet introduced the Euro; seasonally adjusted data for 2011.

¹ Compiled by Julia Wörz, Oesterreichische Nationalbank, Foreign Research Division, julia.woerz@oenb.at.

² The OeNB and the Bank of Finland's Institute for Economies in Transition (BOFIT) compile semiannual forecasts of economic developments in selected CESEE countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania as well as Russia). These forecasts are based on a broad range of available information, including country-specific time-series models for Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania (for technical details, see Crespo Cuaresma, J., M. Feldkircher, T. Slačik and J. Wörz. 2009. Simple but Effective: The OeNB's Forecasting Model for Selected CESEE Countries. In: Focus on European Economic Integration Q4/09. pp. 84–95). The projections for Russia, which were prepared by BOFIT, are based on a SVAR model. Cut-off date for all projections: March 19, 2012.

CESEE-7: External and Domestic Weaknesses Will Continue to Weigh on Economic Growth over the Long Term

According to the current forecast, the CESEE-7 will grow by only 1.4% in 2012 in terms of GDP, and growth dynamics will remain uneven within the region. Poland will continue to outperform the region while Hungary will slide into a recession in the first half of 2012 – primarily caused by domestic factors – and is thus expected to record a small contraction of annual GDP in 2012. Thus, although the CESEE-7 region in the aggregate will not get close to a renewed recession, growth will remain at low levels. Moreover, regional differences will prevail for a longer time than initially anticipated.

Owing to weak external demand, export growth will roughly halve in 2012 in the five countries covered by the OeNB's projections. Thus the contribution of net exports will shrink in all countries remain positive in all countries but Romania. Budget consolidation implies that public consumption will provide no impetus in 2012. Private consumption will likewise be hampered by the current consolidation packages. Weak labor market conditions and tight private sector funding conditions also weigh negatively on private consumption. Even in the absence of bottlenecks in private sector credit supply in all countries apart from Hungary, the need to reduce currently elevated levels of private debt in the household sectors of some countries imply a continued drain on demand. Growth in gross fixed capital formation will remain weak in 2012, but will show a rising tendency in most countries except for Poland, where rising private investment will only just compensate for diminishing public investment. Due to heightened uncertainty, restocking will be postponed into 2013.

Taking into account the assumed stabilization in external demand from the euro area, GDP growth is expected to rebound somewhat in 2013. The GDP of the CESEE-7 region will rise by 2.6%, which still represents a rather weak overall growth performance. The recovery will again be led by Poland, the Baltics and the Southeastern European economies Bulgaria and Romania. Growth in the Czech Republic will also pick up again, while growth dynamics will remain more restrained in Hungary. Economic growth will become more balanced again in 2013 in terms of both regional composition and growth drivers.

Domestic demand will pick up throughout the region and will show a positive contribution to GDP growth in all countries. The hesitant recovery of domestic demand in the five countries covered by the current outlook is related to slightly improving financing conditions for the private sector. While consumer spending growth will pick up to some extent, public consumption growth will remain subdued over the entire forecasting period. Investment growth will show some signs of reviving, partly related to inventory restocking and partly to previously postponed investment decisions, improved financing conditions and rising investor confidence. Trade growth will accelerate, but only in line with the moderately improving external environment. Import and export dynamics will be roughly similar; as a result, the contribution of net exports will remain almost unchanged compared to 2012.

The risks to this outlook continue to be tilted downwards. A further intensification of the sovereign debt problems in the euro area's southern periphery, in particular if a shock would occur in a larger country, would impact negatively on the projection outcome in at least two ways: First, investor and business confidence would severely drop in all European catching-up countries, leading to a more protracted weakness in domestic demand. Second, demand for CESEE-7 exports would immediately be reduced, thus also curbing the most robust growth pillar of recent years. In addition, the effects of the EBA's capital requirements decided upon in late 2011 are still not fully clear and imply some continued deleveraging risk for the region. On the other hand, stronger than assumed German growth could pose an upside risk for our projections.

Russia: Brisk Economic Recovery to Level Off Somewhat Owing to Uncertainties

According to the current outlook, annual GDP growth will moderate to 3.7% in 2012 and also in 2013. This leveling-off tendency is influenced by the expected turnaround in crude oil price dynamics and a modest decline of the crude oil price from a currently relatively high level by about 10% over the entire forecast period. The forecast decline of GDP growth in 2012 is attributed to uncertainties in the global economy as well as in Russia. Another point is that farming simply cannot count on another large rebound of the kind it experienced in 2011. In 2013, we expect growth to be supported by rekindled confidence, recovering global economies and trade, and waning uncertainty about future developments in Russia.

Given an overall expected tendency of somewhat slower wage increases, we expect consumer demand to decelerate slightly over the forecast period. The current rapid growth in household borrowing may be reined in as real interest rates on short-term credit (under a year) have risen to exceptionally high levels. After three slow years, growth in public consumption is expected to pick up a bit in 2012, with government spending rising and the Russian economy ministry's forecast suggesting that public investment may expand modestly. Growth in export volumes is expected to remain low in the forecast period. Indeed, the Russian authorities have adjusted their own export estimates for crude oil and petroleum products downward slightly for the coming years, as increased domestic oil consumption exceeds growth in domestic oil production. The impact will, however, be moderated by rising exports of natural gas and of other basic commodities. Growth in corporate fixed capital investment could dip this year amidst uncertainty and should recover in 2013 as uncertainty fades.

The momentous inventory restocking activities following the recession are expected to ease off in 2012 and the coming years. Net capital outflows from Russia may persist in 2012 until the uncertainty in international financial markets recedes and the new government takes measures to improve Russia's business climate. In that case, the direction of net capital flows could also reverse. After rebounding strongly from the recession, import growth eased in recent months. Import expansion is expected to average around 7% a year in the forecast period, reflecting lower post-crisis GDP growth.

Risks to the forecast are largely on the downside. For instance, Russian consumer confidence could erode for domestic reasons even if the global economy develops as assumed. Corporate investors could become more cautious if the prevailing global and domestic uncertainty persists in 2013. Furthermore, Russia would be quick to feel any shock to the world economy if it triggered a sharp drop in crude oil prices or jolted financial markets anew. In such a case, Russia's leadership retains the means for stimulus measures and if needed can be expected to respond actively to cushion adverse impacts on the economy.

Croatia: Prolonged Weakness Mainly Due to Domestic Factors

Economic conditions will remain gloomy in Croatia in 2012, as the economy is forecast to slide into a recession again (−0.9%). In particular, adverse labor market conditions, the increase of the VAT rate from 23% to 25% (March 2012) and the ongoing process of financial deleveraging in the household sector will weigh on private consumption, while the pressing need to consolidate public finances will compromise public consumption. At the same time, a less supportive international environment is expected to hurt exports. Given the gradual recovery of investments and strong base effects, imports are expected to post moderate growth, so that the contribution of net exports to GDP growth is expected to turn negative in 2012.

Driven by a recovery in domestic demand, GDP growth is expected to reach 1.3% in 2013. Consumption will remain rather weak, though. In fact, while private consumption is estimated to pick up due to the base effects related to the VAT hike in 2012 and advanced purchases before EU accession on July 1, 2013, ongoing fiscal consolidation will continue to weigh on public consumption. Investment activity is expected to become the main pillar of growth in 2013. After having contracted strongly for several years in row, gross fixed capital formation is forecast to grow robustly thanks to increasing FDI inflows ahead of EU accession, while inventory restocking ahead of EU entry is expected to provide a strong impetus to economic growth as well. At the same time, the investment-driven recovery of domestic demand will also contribute to accelerating import growth. Together with only moderately firming export growth in a gradually stabilizing global environment, this will result in an increasingly negative contribution of net exports to GDP growth.

Annex: Detailed Result Tables

Table 12

Demand Components (Real Prices)

Chained volume data (reference year = 2005)

	2011	2012	2013	2014	2011	2012	2013	2014
	EUR million				Annual change in %			
Private consumption	142,912	144,415	145,880	147,820	+0.7	+1.1	+1.0	+1.3
Government consumption	49,560	49,760	50,200	50,631	+0.4	+0.4	+0.9	+0.9
Gross fixed capital formation	54,338	55,669	57,086	58,348	+5.0	+2.5	+2.5	+2.2
of which: Investment in plant and equipment	22,658	23,766	24,741	25,533	+9.3	+4.9	+4.1	+3.2
Residential construction investment	10,453	10,630	10,820	10,992	+0.8	+1.7	+1.8	+1.6
Investment in other construction	21,135	21,273	21,526	21,823	+1.2	+0.6	+1.2	+1.4
Changes in inventories (including statistical discrepancy)	5,899	4,639	4,680	5,217	x	x	x	x
Domestic demand	252,709	254,483	257,847	262,016	+2.9	+0.7	+1.3	+1.6
Exports of goods and services	156,466	161,814	171,676	183,341	+7.1	+3.4	+6.1	+6.8
Imports of goods and services	138,084	142,876	151,347	161,220	+7.5	+3.5	+5.9	+6.5
Net exports	18,382	18,937	20,329	22,121	x	x	x	x
Gross domestic product	271,090	273,421	278,176	284,137	+3.0	+0.9	+1.7	+2.1

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Table 13

Demand Components (Current Prices)

	2011	2012	2013	2014	2011	2012	2013	2014
	EUR million				Annual change in %			
Private consumption	161,227	166,937	171,725	177,340	+3.5	+3.5	+2.9	+3.3
Government consumption	56,646	58,526	59,706	61,293	+2.3	+3.3	+2.0	+2.7
Gross fixed capital formation	63,252	66,014	69,060	72,062	+7.7	+4.4	+4.6	+4.3
Changes in inventories (including statistical discrepancy)	9,615	6,555	6,813	7,960	x	x	x	x
Domestic demand	290,739	298,031	307,304	318,654	+6.2	+2.5	+3.1	+3.7
Exports of goods and services	171,903	181,850	196,498	213,749	+10.9	+5.8	+8.1	+8.8
Imports of goods and services	162,081	171,828	185,621	201,781	+13.8	+6.0	+8.0	+8.7
Net exports	9,822	10,021	10,877	11,969	x	x	x	x
Gross domestic product	300,562	308,053	318,181	330,623	+5.0	+2.5	+3.3	+3.9

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Table 14

Deflators of Demand Components

	2011	2012	2013	2014	2011	2012	2013	2014
	2005 = 100				Annual change in %			
Private consumption	112.8	115.6	117.7	120.0	+2.8	+2.5	+1.8	+1.9
Government consumption	114.3	117.6	118.9	121.1	+1.8	+2.9	+1.1	+1.8
Gross fixed capital formation	116.4	118.6	121.0	123.5	+2.6	+1.9	+2.0	+2.1
Domestic demand (excluding changes in inventories)	113.9	116.7	118.7	121.0	+2.6	+2.4	+1.7	+1.9
Exports of goods and services	109.9	112.4	114.4	116.6	+3.5	+2.3	+1.8	+1.9
Imports of goods and services	117.4	120.2	122.6	125.1	+5.9	+2.4	+2.0	+2.0
Terms of trade	93.6	93.5	93.3	93.2	-2.3	-0.2	-0.2	-0.2
Gross domestic product	110.9	112.7	114.4	116.4	+1.9	+1.6	+1.5	+1.7

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Table 15

Labor Market

	2011	2012	2013	2014	2011	2012	2013	2014
	Thousands				Annual change in %			
Total employment	4,128.1	4,193.1	4,235.1	4,289.7	+1.5	+1.6	+1.0	+1.3
of which: Private sector employment	3,598.0	3,663.6	3,706.3	3,761.6	+1.7	+1.8	+1.2	+1.5
Payroll employment (national accounts definition)	3,582.0	3,638.7	3,676.7	3,724.7	+1.7	+1.6	+1.0	+1.3
	% of labor supply							
Unemployment rate (Eurostat definition)	4.2	4.3	4.3	4.2	x	x	x	x
	EUR per real output unit x 100							
Unit labor costs (whole economy) ¹	63.2	65.2	66.2	67.6	+0.8	+3.1	+1.6	+2.0
	EUR thousand per employee							
Labor productivity (whole economy) ²	65.7	65.2	65.7	66.2	+1.5	-0.7	+0.7	+0.8
	EUR thousand							
Real compensation per employee ³	36.8	36.8	37.0	37.3	-0.4	-0.1	+0.5	+1.0
	At current prices in EUR thousand							
Gross compensation per employee	41.5	42.5	43.5	44.8	+2.4	+2.4	+2.3	+2.9
	At current prices in EUR million							
Total gross compensation of employees	148,734	154,709	159,994	166,795	+4.1	+4.0	+3.4	+4.3

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

¹ Gross wages divided by real GDP.

² Real GDP divided by total employment.

³ Gross wages per employee divided by the private consumption expenditure (PCE) deflator.

Table 16

Current Account

	2011	2012	2013	2014	2011	2012	2013	2014
	<i>EUR million</i>				<i>% of nominal GDP</i>			
Balance of trade	7,057.0	6,700.8	8,896.2	10,647.7	2.3	2.2	2.8	3.2
Balance on goods	-6,962.0	-5,296.8	-3,687.0	-2,063.8	-2.3	-1.7	-1.2	-0.6
Balance on services	14,019.0	11,997.7	12,583.2	12,711.5	4.7	3.9	4.0	3.8
Balance on income	854.0	639.9	383.3	362.9	0.3	0.2	0.1	0.1
Balance on transfers	-2,056.0	-781.2	-954.5	-1,425.9	-0.7	-0.3	-0.3	-0.4
Current account	5,855.0	6,559.5	8,324.9	9,584.7	1.9	2.1	2.6	2.9

Source: 2011: Eurostat; 2012 to 2014: OeNB June 2012 outlook.

Table 17

Quarterly Outlook Results

	2012	2013	2014	2012				2013				2014			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Prices, wages and costs	<i>Annual change in %</i>														
HICP	+2.4	+1.7	+1.9	+2.7	+2.4	+2.1	+2.2	+2.0	+1.5	+1.8	+1.6	+1.8	+1.9	+1.9	+2.0
HICP (excluding energy)	+2.0	+1.8	+2.0	+2.3	+2.0	+1.7	+2.0	+1.9	+1.6	+1.8	+1.7	+1.9	+2.0	+2.0	+2.1
Private consumption expenditure (PCE) deflator	+2.5	+1.8	+1.9	+2.7	+2.5	+2.4	+2.2	+1.9	+1.8	+1.8	+1.9	+1.9	+1.9	+1.9	+1.9
Gross fixed capital formation deflator	+1.9	+2.0	+2.1	+1.5	+2.0	+1.9	+2.2	+2.7	+1.7	+1.8	+1.9	+1.9	+2.0	+2.2	+2.3
GDP deflator	+1.6	+1.5	+1.7	+1.6	+1.6	+1.6	+1.6	+1.5	+1.5	+1.5	+1.6	+1.7	+1.8	+1.8	+1.7
Unit labor costs	+3.1	+1.6	+2.0	+3.5	+3.4	+3.1	+2.5	+1.8	+1.7	+1.5	+1.5	+1.5	+1.8	+2.2	+2.7
Nominal wages per employee	+2.4	+2.3	+2.9	+2.5	+2.3	+2.4	+2.4	+2.3	+2.4	+2.3	+2.3	+2.3	+2.6	+3.1	+3.6
Productivity	-0.7	+0.7	+0.8	-1.0	-1.1	-0.7	-0.1	+0.5	+0.7	+0.8	+0.8	+0.8	+0.8	+0.9	+0.9
Real wages per employee	-0.1	+0.5	+1.0	-0.2	-0.2	+0.0	+0.2	+0.4	+0.6	+0.5	+0.4	+0.4	+0.7	+1.1	+1.7
Import deflator	+2.4	+2.0	+2.0	+2.1	+2.3	+2.1	+3.3	+3.7	+1.3	+1.6	+1.5	+1.6	+1.9	+2.2	+2.5
Export deflator	+2.3	+1.8	+1.9	+2.6	+2.3	+2.2	+2.1	+1.9	+1.9	+1.8	+1.8	+1.8	+1.8	+1.9	+1.9
Terms of trade	-0.2	-0.2	-0.2	+0.5	+0.0	+0.0	-1.2	-1.7	+0.6	+0.2	+0.3	+0.2	-0.1	-0.3	-0.6
Economic activity	<i>Annual and/or quarterly changes in % (real)</i>														
GDP	+0.9	+1.7	+2.1	+0.2	+0.3	+0.3	+0.4	+0.4	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.6
Private consumption	+1.1	+1.0	+1.3	+0.2	+0.4	+0.3	+0.3	+0.2	+0.2	+0.3	+0.3	+0.3	+0.4	+0.4	+0.4
Government consumption	+0.4	+0.9	+0.9	+0.1	+0.0	+0.0	+0.1	+0.2	+0.3	+0.4	+0.3	+0.3	+0.1	+0.0	-0.1
Gross fixed capital formation	+2.5	+2.5	+2.2	+0.4	+0.4	+0.5	+0.6	+0.7	+0.7	+0.7	+0.7	+0.5	+0.5	+0.4	+0.4
Exports	+3.4	+6.1	+6.8	+0.7	+1.1	+1.4	+1.4	+1.5	+1.5	+1.6	+1.6	+1.6	+1.7	+1.7	+1.7
Imports	+3.5	+5.9	+6.5	+0.5	+1.3	+1.4	+1.4	+1.4	+1.5	+1.5	+1.5	+1.6	+1.6	+1.7	+1.7
	<i>Contribution to real GDP growth in percentage points</i>														
Domestic demand	+1.1	+1.2	+1.3	+0.2	+0.3	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Net exports	+0.2	+0.5	+0.6	+0.2	+0.0	+0.1	+0.1	+0.2	+0.1	+0.2	+0.2	+0.1	+0.2	+0.2	+0.2
Changes in inventories	-0.5	+0.0	+0.2	-0.2	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.1	+0.2	+0.1
Labor market	<i>% of labor supply</i>														
Unemployment rate (Eurostat definition)	4.3	4.3	4.2	4.1	4.2	4.4	4.4	4.4	4.3	4.3	4.3	4.2	4.2	4.2	4.2
	<i>Annual and/or quarterly changes in %</i>														
Total employment	+1.6	+1.0	+1.3	+0.6	+0.3	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
of which: Private sector employment	+1.8	+1.2	+1.5	+0.7	+0.4	+0.3	+0.2	+0.3	+0.3	+0.3	+0.4	+0.4	+0.4	+0.4	+0.4
Payroll employment	+1.6	+1.0	+1.3	+0.5	+0.3	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Additional variables	<i>Annual and/or quarterly changes in % (real)</i>														
Real disposable household income	+0.8	+1.0	+2.1	-1.3	+1.2	-0.9	+0.1	+0.5	+0.4	+0.4	+0.5	+0.7	+0.5	+0.5	+0.4
	<i>% of real GDP</i>														
Output gap	-0.4	-0.3	0.2	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2	-0.1	0.0	0.1	0.3	0.5

Source: OeNB June 2012 outlook (based on seasonally and working-day adjusted data).

Comparison of Current Economic Forecasts for Austria

Indicator	OeNB			WIFO		IAS		OECD		IMF		European Commission	
	June 2012			March 2012		March 2012		May 2012		April 2012		May 2012	
	2012	2013	2014	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
Key results	<i>Annual change in %</i>												
GDP (real)	+0.9	+1.7	+2.1	+0.4	+1.4	+0.8	+1.7	+0.8	+1.6	+0.9	+1.8	+0.8	+1.7
Private consumption (real)	+1.1	+1.0	+1.3	+0.8	+0.9	+0.7	+1.1	+0.9	+1.2	x	x	+0.8	+1.0
Government consumption (real)	+0.4	+0.9	+0.9	-1.0	-1.0	+0.5	+0.0	+0.7	+0.0	x	x	+0.7	+1.2
Gross fixed capital formation (real)	+2.5	+2.5	+2.2	+1.1	+2.0	+0.5	+1.7	+1.8	+2.1	x	x	+1.4	+2.3
Exports (real)	+3.4	+6.1	+6.8	+3.3	+5.9	+3.3	+5.7	+2.6	+6.3	+2.5	+5.6	+2.8	+5.1
Imports (real)	+3.5	+5.9	+6.5	+3.2	+5.0	+2.7	+5.2	+2.9	+5.6	+2.9	+5.5	+2.2	+4.9
GDP per employee	-0.7	+0.7	+0.8	-0.5	+0.8	+0.1	+1.0	x	x	x	x	+0.3	+1.0
GDP deflator	+1.6	+1.5	+1.7	+1.7	+1.4	+1.9	+1.7	+1.5	+1.4	x	x	+1.9	+1.5
CPI	x	x	x	+2.4	+2.0	+2.2	+2.0	x	x	x	x	x	x
HICP	+2.4	+1.7	+1.9	+2.5	+2.1	x	x	+2.3	+1.8	+2.2	+1.9	+2.4	+2.0
Unit labor costs	+3.1	+1.6	+2.0	+3.6	+1.3	x	x	x	x	x	x	+3.2	+0.9
Payroll employment	+1.6	+1.0	+1.3	+0.8	+0.4	+0.7	+0.7	x	x	+0.3	+0.8	+0.4	+0.7
	<i>% of labor supply</i>												
Unemployment rate (Eurostat definition)	4.3	4.3	4.2	4.6	4.8	4.5	4.4	4.6	4.8	4.4	4.3	4.3	4.2
	<i>% of nominal GDP</i>												
Current account	2.1	2.6	2.9	1.4	1.8	x	x	2.2	2.5	1.4	1.4	1.9	1.9
Budget balance (Maastricht definition)	-2.8	-1.6	-1.2	-3.0	-2.6	-2.9	-2.1	-2.9	-2.3	-3.1	-2.4	-3.0	-1.9
External assumptions													
Oil price in USD/barrel (Brent)	115.7	109.3	103.1	120.0	120.0	125.0	130.0	129.8	136.3	114.7	110.0	116.8	110.2
Short-term interest rate in %	0.8	0.7	1.0	1.1	1.5	1.0	1.1	0.6	0.3	0.8	0.8	0.8	0.8
USD/EUR exchange rate	1.31	1.31	1.31	1.30	1.30	1.30	1.28	1.31	1.31	1.32	1.32	1.31	1.31
	<i>Annual change in %</i>												
Euro area GDP (real)	-0.5 to +0.3	0.0 to +2.0	x	-0.2	+1.3	-0.2	+1.2	-0.1	+0.9	-0.3	+0.9	-0.3	+1.0
U.S. GDP (real)	+2.2	+2.2	+2.8	+2.0	+2.3	+2.5	+2.3	+2.4	+2.6	+2.1	+2.4	+2.0	+2.1
World GDP (real)	+3.2	+3.8	+4.2	+3.4	+4.0	x	x	+3.4	+4.2	+3.5	+4.1	+3.3	+3.7
World trade	+4.4	+6.4	+7.2	+5.0	+7.0	+4.5	+7.0	+4.1	+7.0	+4.0	+5.6	+4.1	+5.7

Source: OeNB, WIFO, IAS, OECD, IMF, European Commission.

Business Cycle Synchronization in the Euro Area and the Impact of the Financial Crisis

The extent of synchronization of national business cycles is a widespread indicator for gauging whether individual countries are indeed ready to adopt a common currency. The occurrence of asymmetric shocks and their consequences in Economic and Monetary Union (EMU) may hamper implementation of monetary policy, as such shocks may significantly raise the cost of the single monetary policy for individual countries. This study analyzes whether the synchronization pattern of business cycles in the euro area has systematically changed since the outbreak of the global financial crisis in 2008. Country-specific differences in the terms of trade and fiscal imbalances may have caused the global shock to affect euro area countries asymmetrically. Conversely, the business cycles of individual countries may have become more closely synchronized, as all countries slipped into recession at the same time. For the purpose of this study we use empirical data to establish which of the two effects dominates. The results of the analysis show a pronounced desynchronization of business cycles during the crisis period, both with respect to dispersion and to the correlation of business cycles. Moreover, interesting differences and parallels may be observed between the developments since the beginning of the most recent financial crisis and an earlier period, around 2004, when the output gap in the euro area was negative as well.

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In the empirical literature, the synchronization of business cycles between individual countries has become established as a key criterion of whether these countries are ready to form a monetary union (see section 1 for a literature review). The argumentation is as follows: If the potential members of a monetary union are subject to symmetric economic shocks, the benefits of a common currency exceed the cost of relinquishing a national autonomous monetary policy (among others, Bayoumi and Eichengreen, 1997; Masson and Taylor, 1993; Alesina et al., 2002). Although the criterion of synchronized business cycles is controversial,² it would appear expedient to analyze the synchronization of business cycles in the euro area after the introduction of the

euro, as the identification of divergent tendencies is an important prerequisite for economic policymakers to take appropriate corrective action.

Since the outbreak of the global financial crisis, the heterogeneity of the euro area has again moved to the forefront of economic policy discussions. Country-specific differences in the terms of trade and fiscal imbalances prior to the outbreak of the crisis may have led to asymmetrical effects of the global shock on the euro area on the one hand; on the other hand, the global financial crisis may have caused European business cycles to become more strongly synchronized, given the weak international environment. Ultimately, with the onset of the crisis, all industrial countries slipped into recession

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² The argument of the endogeneity of optimum currency areas (OCAs) was first pointed out by Frankel and Rose (1998). It states that individual countries are more likely to meet some OCA criteria (in particular symmetrical business cycles) after establishment of a monetary union than ex ante. They argue that the establishment of a monetary union strengthens trade ties between member countries and, as a consequence, may lead to more closely synchronized business cycles.

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more or less at the same time. The current consolidation course may, in theory, work both ways: On the one hand, fiscal policy itself can trigger asymmetric shocks, e.g. because of nonuniform national fiscal measures; on the other hand, it can also be used as an instrument to smooth asymmetric shocks. Therefore, the theoretical effect of divergent budget deficits such as those observable during the crisis is ambiguous. Crespo Cuaresma and Fernández-Amador (2010) and Crespo Cuaresma et al. (2011) show that fiscal deficits may be a major source of idiosyncratic macroeconomic volatility, especially in the euro area. Therefore, this study uses empirical data to provide clearer insights into whether the crisis has caused business cycles to become more synchronized or more desynchronized. Although the impact of the financial crisis on the synchronization of business cycles is highly topical, the academic literature has not treated this issue so far, among other things due to the short time series since 2008.

What is the best method for measuring the symmetry of shocks or the synchronization of business cycles between the member countries of a mon-

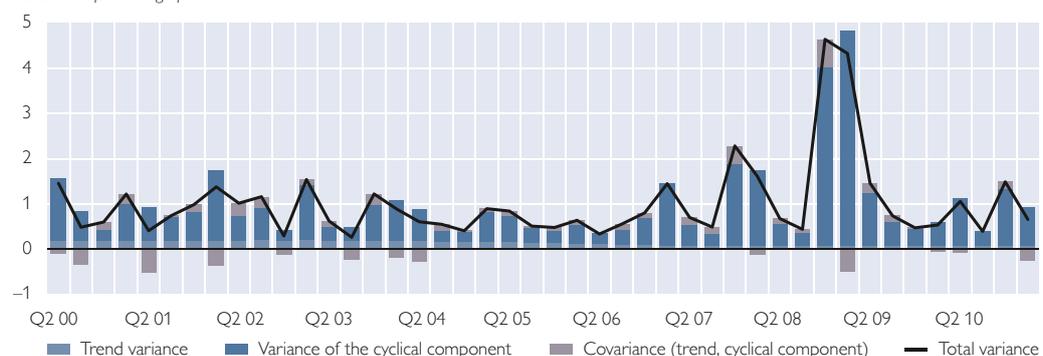
etary union? A common method used in the relevant literature is to filter country-specific GDP time series to isolate the cyclical from the trend component. The difference between the GDP time series and the long-term trend is equivalent to the cyclical component, also frequently referred to as the output gap, i.e. the divergence of current output from potential output. It is an important indicator for determining the optimality of a monetary union from the monetary policy perspective: If the output gap is negative, unemployment threatens, whereas a positive output gap increases inflationary pressure. Therefore, it becomes very hard to conduct a monetary policy that fits all countries' needs if cyclical components differ greatly among individual countries.

A simple look at the GDP growth rates in individual euro area countries signals possible divergent trends during the crisis. Chart 1 shows the total variance of the quarterly real GDP growth rates in the 17 euro area countries in the respective quarters from 2000 to early 2011. The double rise in the variance of growth rates at the end of 2007 and again at the end of 2008 is clearly

Chart 1

Contributions to the Total Variance of Real GDP Growth Rates (Quarter on Quarter) in Euro Area Countries

Variance in percentage points



Source: Eurostat, authors' calculations.

visible. Moreover, the variance contributions³ show that in particular the cyclical component contributed strongly to the heterogeneity of growth rates. As growth rates capture only the change on the previous period and thus make no statement about the output gap level (in particular about whether the output gap is positive or negative), the level of the output gap is analyzed below. Two indicators are used to measure synchronization, namely bilateral correlation coefficients and the standard deviation of the cyclical component. Next, the extent to which particular countries drive the development of these indicators is discussed. This allows for those countries to be filtered which contributed most to the desynchronization of business cycles. To assess the robustness of these results, the analysis is also applied to the monthly industrial output data. Although these variables represent only a relatively small share of GDP (around 20%), these industrial output data have the advantage of being available more often – monthly – as well as of exhibiting a high correlation with GDP.

Section 1 discusses the relevant academic literature on European business cycles to provide an overview of historical developments also prior to the establishment of EMU. Section 2 describes the data set and the methods used to produce the empirical estimates presented in section 3. The results are discussed in section 4, where possible conclusions from the analysis are drawn.

1 Synchronization of European Business Cycles – A Literature Survey

The economic analysis of the suitability of a region of sovereign states for monetary union originates with the theory of optimum currency areas, or OCA theory. Nearly half a century has passed since publication of the first academic contribution to OCA theory (among others, Mundell, 1961; McKinnon, 1963; Kenen, 1969). During this period, several criteria were suggested in the literature that a region should meet before establishing an OCA.⁴ These include (1) price and wage flexibility (Friedman, 1953), (2) high factor mobility, in particular for the labor market (Mundell, 1961), (3) a high degree of financial integration (Mundell, 1973), among other things to create a “private” insurance system for asymmetric shocks,⁵ (4) a high degree of openness of the economy (McKinnon, 1963), (5) a high diversification of production and consumption (Kenen, 1969), (6) similar inflation rates and stable terms of trade (Fleming, 1971), (7) a high degree of fiscal integration, preferably with supranational fiscal transfers (Kenen, 1969) or a coordinated economic policy, and (8) political integration or the political will to found such a currency area (Mintz, 1970; Haberler, 1970). OCA theory has often been criticized, however, as the different criteria could not be integrated within a uniform framework. Moreover, some of the listed criteria are difficult to measure (Robson, 1987) or to compare (e.g. Tavlas, 1994).

³ GDP was split into a trend component and a cyclical component (see also section 2) by applying a Hodrick-Prescott filter (Hodrick and Prescott, 1997) to the log of the GDP time series. Consequently, the contributions to total variance may be easily calculated using the following equation:

$$\text{Var}(dY) = \text{Var}(dT) + \text{Var}(dC) + 2 * \text{Cov}(dT, dC), \text{ with } dY \text{ representing GDP growth, } dC \text{ the growth of the cyclical component and } dT \text{ trend growth.}$$

⁴ See e.g. Mongelli (2008) for a comprehensive literature survey.

⁵ This study defines “asymmetric shock” as an unexpected supply-side or demand-side shock or financial impulse that has different effects on output and employment in the affected countries.

In the end, the discussion led to the development of a few “metacriteria” that implicitly subsume some of the individual conditions. In particular, the synchronization of business cycles has become established as a key OCA metacriterion.

The academic literature features a number of studies that treat the synchronization of business cycles in the EU or in the euro area and that contain observations of developments over time. However, only few robust patterns can be derived from these studies,⁶ as the contributions differ in the following ways: (1) the samples include different countries; (2) the periods covered in the analysis differ; (3) the methods to determine the cyclical component (i.e. the chosen filter) differ; and (4) the methods for measuring the synchronization of the business cycles differ.⁷ One question has been debated particularly broadly in the literature, namely whether the introduction of the single currency would contribute to the synchronization of business cycles, or whether it would instead reinforce the divergence of business cycles. On purely theoretical grounds, the answer is not clear-cut. On the one hand, intensified trade relations may have led to a more symmetrical transmission of arising shocks to individual member countries, so that the OCA criteria may be easier to fulfill *ex post* than *ex ante* (e.g. Frankel and Rose, 1998). On the other hand, as Krugman (1991) argues, economies of scale and scope in a monetary union may also induce individual regions to concentrate more on particular industries, which could reinforce asymmetrical shocks. Other authors

cover the question of whether the business cycles in European countries have both a global and a European component, allowing a separate European business cycle to be discerned.

1.1 Synchronization of Business Cycles in the Euro Area

Whereas even before the introduction of the euro a broad set of literature analyzed the synchronization of business cycles in the euro area and thus the suitability of countries for forming a currency union, more recent studies cover the difference in the symmetry of shocks before and after the introduction of the euro. In their paper, Massmann and Mitchell (2004) provide a historical overview in which they examine over 40 years’ worth of monthly industrial production data using eight different variables. They identify both periods of divergence as well as convergence; in the 1990s, however, they observe a clear trend increase in the synchronization of business cycles. Other studies (e.g. Altavilla, 2004; Darvas and Szapáry, 2004) confirm this development, which might partly be driven by the introduction of the convergence criteria stipulated in the Maastricht Treaty. Camacho et al. (2006) find a relatively high degree of synchronization between euro area countries, but their results do not show a significant increase in synchronization since the adoption of the euro. By contrast, Böwer and Guillemineau (2006) analyze the determinants of the synchronization of business cycles and identify an increase in the synchronization of business cycles since the euro introduction, mainly on account of the rise in intra-industrial trade within

⁶ For a comprehensive literature survey on this issue, see De Haan et al. (2008).

⁷ Section 2 treats the different filtering techniques with which to decompose the time series and derive the cyclical component of GDP and possible measures of synchronization (such as bilateral correlation coefficients, etc.) in more detail.

EMU. Gayer (2007), in turn, sees a general decline in the dispersion of output gaps in EMU member states, which he attributes to a general narrowing of the amplitude of the cyclical component, whereas synchronization (measured in terms of bilateral correlation coefficients) is relatively high but has not augmented further since the 1990s. Giannone et al. (2009) also point out that EMU has changed neither the historical characteristics of national business cycles nor the bilateral correlation coefficients of these cycles. Furceri and Karras (2008) compare the five-year period preceding the introduction of the euro and the five years after introduction using a fixed five-year window for each country and establish a markedly higher correlation of national business cycles. They ascribe this effect above all to trade-related influences and stepped-up fiscal coordination of EMU member countries. Weyerstraß et al. (2011) cannot confirm these effects after performing a more comprehensive analysis with dynamic correlations; they do not find that the euro area business cycles have become more synchronized after 1999. Although the results depend on the respective sample, the method and the measure of synchronization, as mentioned above, this literature does allow some facts to be concluded. Most of the studies concur in identifying convergence in euro area business cycles in the 1990s in the run-up to EMU, and in determining stabilization at a relatively high degree of symmetry thereafter. Moreover, most studies reject a further convergence of the business cycles since the foundation of EMU.

1.2 Is there a European Business Cycle?

In addition to the strand of literature that examines the synchronization of business cycles, there is a strand that treats the decomposition of the fluctuations in the different regions, industries or countries.⁸ Artis (2003) comes to the conclusion that a particular European business cycle is very difficult to identify. The findings of a lack of a coherent, exclusively European business cycle confirm the results of Massmann and Mitchell (2004). In the same vein, Kose et al. (2003) do not find a specifically European business cycle, as only a small part of euro area GDP can be attributed to a common European factor. Mansour (2003) splits the variance of growth into global, European and country-specific factors. Whereas the European component does not play an insignificant role, the influence of this European business cycle varies strongly among countries. In contrast, other authors, such as Lumsdaine and Prasad (2003) or Canova et al. (2005), emphasize the existence of a global business cycle. Camacho et al. (2006) develop indicators of the distance between national business cycles. While they reject the existence of a European business cycle, they find that the bilateral distances in the euro area are relatively small and hence that these economies are more synchronized among each other than with countries that are not EMU members. To conclude, the evidence from the literature available is very heterogeneous on the issue of the existence of a European business cycle.

⁸ For an overview of the key methods in this field of research, see Clark and Shin (2000).

1.3 Have the Patterns Changed since the Onset of the Financial Crisis?

By contrast to the abundant literature on the impact of the single monetary policy on the synchronization of business cycles, the academic literature has not yet examined the effects of the current financial crisis since 2008. The main reason is likely to be that only a fairly short time series on the crisis is available at the end of the sample, which makes it hard to draw meaningful conclusions. Gayer (2007) establishes that the correlation of euro area countries' business cycles declines quite sharply around 2003 but begins to strengthen again in the course of 2004. From earlier periods of economic weakness, the author concludes that a decline in the synchronization of business cycles often occurs in the early recovery phase after a recession (e.g. the beginning upturn after dot-com bubble burst in 2003). Therefore, it would be particularly interesting to clarify whether this pattern is repeated or even reinforced in the far stronger recession or crisis from 2008.

2 Methodological Framework

2.1 Data

To measure the synchronization of business cycles, this study avails itself of the two most important variables that are also most frequently used in the literature, GDP and industrial production (De Haan et al., 2008). Whereas GDP is the most comprehensive output variable,⁹ industrial production is also

frequently used, because it correlates strongly with GDP and because data are collected monthly. As long time series of quarterly GDP data are often not available, the use of data with a higher frequency is an advantage in terms of the robustness of the results. Therefore, the data used in this study are (1) quarterly real GDP data (seasonally adjusted, at 2005 prices) for the quarters Q1 95 to Q3 11, and (2) the index of industrial production (excluding construction) (2005 = 100) from January 2000 to January 2012 (also seasonally adjusted). The countries covered are the 17 EMU member states and EMU aggregate (EA-17).¹⁰ To ensure comparability of the synchronization variables over time, the countries that joined EMU after 2000 – Estonia (2011), Slovakia (2009), Malta (2008), Cyprus (2008), Slovenia (2007) and Greece (2001) – are taken into account for the entire observation period. All data used are taken from Eurostat's online database¹¹ and are thus comparable across the cross-section of countries and over time.

2.2 Measurement of Business Cycles

The output gap is a fundamental determinant of central banks' key interest rate policy, as it indicates inflationary pressure in an economy. Therefore, the synchronization of the output gaps of individual countries is chosen as a measure of the optimality of a monetary union. The concept that the literature employs to measure the output gap is a purely statistical decomposition

⁹ Some studies examine GDP as well as GDP subcomponents, such as consumption, investment and exports (e.g. Sopraseuth, 2003).

¹⁰ Data are available only from Q1 97 for Ireland and Slovakia and from Q1 00 for Greece and Malta. Moreover, the time series for Greece already ends in Q1 11. Therefore, the synchronization measures are calculated only from Q1 00 to Q1 11 (except in chart 8). However, all available data are used to estimate the business cycles, meaning that the time series for most countries begin in Q1 95. With the exception of Malta (from January 2005), industrial production data are available for all countries from January 2000.

¹¹ <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/> (as retrieved on March 5, 2012).

process in which a trend is extracted from the time series (in this case of GDP and industrial production data) that can be interpreted as potential output. The cyclical component is obtained by subtracting potential output from the original variable and is thus an estimate of the output gap.

Several filter methods are available to estimate the cyclical component of a time series. A handful of business cycle extraction methods are used in the literature, mainly the Hodrick-Prescott filter (HP filter; Hodrick and Prescott, 1997), the Baxter-King band-pass filter (Baxter and King, 1999), the Christiano-Fitzgerald band-pass filter (Christiano and Fitzgerald, 2003), and finally the phase-average trend (PAT; Boschan and Ebanks, 1978). As the choice of the filter method only insignificantly influences the result (Massmann and Mitchell, 2004), i.e. the degree of synchronization of euro area business cycles, we use the HP filter to decompose the relevant time series. This filter is used most often in the literature, thus increasing the comparability of results with those of other studies. What is more, use of the HP filter dispenses with the need to generate additional series values at the beginning and at the end of the time series (backcasts and forecasts), unlike with the use of the Baxter-King filter, where such values are needed to estimate a cyclical component at the endpoints of the time series. This is a particularly relevant argument for a study such as this one focusing on the analysis of the end period.

A multitude of standard textbooks on time series econometrics provide a formal description of HP filter estimation (e.g. Enders, 1995, p. 210). The

underlying idea is to estimate a trend component so that the deviations of the individual observations from a trend are minimized. The degree of trend smoothing is determined *ex ante*. Smoothing is carried out according to the methods commonly recommended in the literature.¹² The estimated output gaps of the euro area countries are shown in chart 9 in section 3.3, where they are also compared and discussed. The growth of the estimated potential output is shown in the descriptive table in the annex (table 1). A comparison of the development over time indicated that potential growth is below the long-term average of the period from Q1 01 to Q3 11 in all countries except Malta after the beginning of the global recession (the “Great Recession”) in 2008. The estimation of potential output used here may differ from other estimations, as other authors have used other calculation methods. The concept we used is a purely statistical decomposition process, whereas the estimates of the European Commission, for example, are based on the production function approach, which takes into account important economic variables of countries, such as capital stock and the unemployment rates.

Caveats in Measuring Business Cycles

As some studies have shown (e.g. Orphanides and Norden, 2002), the estimation of the output gap (and hence potential output) at the end of the sample and based on real-time data is subject to great uncertainty. This is traceable mainly to three factors: First, the latest GDP data are subject to revisions, which may lead to substantial changes in the output gap *ex post*. Second, the results calculated with the

¹² We calculated the estimation with the respective application provided in EViews 7.0.0.1 and chose 1,600 as the smoothing parameter for the quarterly data and 14,400 as the smoothing parameter for the monthly data.

estimation methods available – this includes the HP filter method – differ if additional data become available after the relevant quarter (end-of-sample problem). Third, the future GDP development may go hand in hand with a structural change in the economy, so that revisions may change potential output as well as the output gap.

Based on data for the euro area, Marcellino and Musso (2010) showed that GDP time series revisions only contributed marginally to the uncertainty of estimations. Conversely, end-of-sample parameter instability of the estimation methods plays a significant role. To quantify how many of the observed quarters are subject to uncertainty at the end of the sample, a robustness analysis of the two main synchronization measures, dispersion and correlation (see section 2.3) is performed in section 3.1 to clarify the end-of-sample bias.

In a first step, several quarters at the end of the sample are left out when estimating the output gap. Next, the synchronization measures are calculated based on the new time series. A comparison with the original results indicates the number of quarters in which the synchronization measures deviated significantly at the end of the sample. Any evidence established about the synchronization of business cycles in the euro area will therefore be subject to a high degree of uncertainty in those end-of-sample quarters.

2.3 Choice of the Synchronization Measures

After determining the relevant variables as an OCA metacriterion, a suitable measure must be selected that provides information about the synchronization of this variable between

countries. Several measures have been proposed in the relevant literature that are often referred to as synchronization measures, as among other things the temporal correlation of output gaps is important. The *correlation coefficient* is the most frequently used synchronization measure; it is also the one we use in this study. In addition, we analyze the *dispersion* of business cycles. To ascertain whether the pattern has changed since the onset of the most recent financial crisis, we compare the period up to the third quarter of 2008 with the subsequent period. As a cutoff date, we chose the insolvency of the U.S. investment bank Lehman Brothers on September 15, 2008. Other cutoff dates were also analyzed to verify the robustness of the results. The synchronization measures chosen are described in more detail below, and an explanation of why it is necessary to examine both measures to derive statements about the optimality of a single monetary policy is provided.

We use the standard deviation of the euro area countries' output gaps to measure the dispersion of the business cycles. Business cycle dispersion can be observed over time and thus provides insights into whether output gaps converge or diverge. The dispersion measure is an important bit of information, as countries whose output gap fluctuates sharply require larger interest rate steps than countries in which the size of the output gap fluctuates less. We use the weighted and unweighted standard deviation (STD) as a dispersion measure. Countries with a higher GDP are assigned a higher weight in weighted STD.¹³ The last measure is used to reflect the fact that a weighted concept is at the heart of the euro area and that the ECB's monetary policy applies to

¹³ This study uses euro area GDP in 2005 for weighting.

the entire euro area. After calculating the dispersion, we use the Carree and Klomp (1997)¹⁴ test to establish whether the dispersion has changed significantly since the outbreak of the financial crisis. Finally, we use the cost-of-inclusion indicator proposed by Crespo Cuaresma and Fernández-Amador (2010) to measure the influence of participation in EMU by a particular country on the development of dispersion. This indicator demonstrates whether one country predominates the result in aggregate developments, i.e. how high the potential cost of that country's EMU inclusion (or entry) would be. The indicator of inclusion of country j in EMU consisting of country group Ω is calculated as follows:

$$coi_{t,j} | \Omega = \frac{\hat{S}_t | \Omega_{-j} - \hat{S}_t | \Omega}{\hat{S}_t | \Omega}$$

$\hat{S}_t | \Omega$ ($\hat{S}_t | \Omega_{-j}$) refers to the standard deviation of the cyclical components across all countries including (excluding) country j . The indicator thus shows the change in the dispersion rate (i.e., standard deviation) resulting from the inclusion of the respective country and is negative if the standard deviation of the country group increased because of the inclusion of country j (i.e. if the country contributes to the desynchronization of business cycles).

The disadvantage of using dispersion as a measure of synchronization is that business cycles with similar amplitudes may in fact be moving in opposite

directions. This would make it harder to conduct a single monetary policy. As a rule, an expansionary monetary policy is called for to counteract a downswing, whereas monetary policy should react restrictively to an upswing. However, it must be noted that ECB's monetary policy is oriented primarily on a price stability goal. In this light, upturns and downturns are simply harbingers of a change in the inflation rate.

The correlation coefficient is suitable for identifying such developments, as it reveals the strength of the linear relationship between simultaneously measured values in two time series. As the correlation coefficient, in turn, has the shortcoming of not being able to indicate differences in the size of the amplitude, both measures are required to adequately assess the prerequisites for a single monetary policy.

To obtain a detailed impression of the temporal development of bilateral correlation coefficients, we calculate these coefficients for a moving two-year window, the mean values of which are displayed in a chart for ease of reading.¹⁵ Additionally, we calculate the mean value of the bilateral correlation coefficients in both periods: the correlations between the business cycles of each country pair¹⁶ are calculated individually and then averaged over one of the two periods. Both calculations take into account country weights, i.e. each bilateral coefficient is multiplied by a country pair-specific weight. This weight is measured on the basis of the GDP

¹⁴ The Carree and Klomp test statistic is calculated as follows:

$T_{2,t,\tau} = (N-2.5) \log [1 + 0.25 (\hat{S}_t^2 - \hat{S}_{t+\tau}^2)^2 / (\hat{S}_t^2 \hat{S}_{t+\tau}^2 - \hat{S}_{t,t+\tau}^2)]$, with \hat{S}_t^2 referring to the standard deviation of business cycles and $\hat{S}_{t,t+\tau}^2$ referring to the covariance of the business cycles at times t and $t+\tau$. Under the null hypothesis that STD has not changed between times t and $t+\tau$, the test statistic follows a $\chi^2(1)$ distribution. For an application, see also Crespo Cuaresma and Fernández-Amador (2010).

¹⁵ As the available time series is rather short (observations for all countries are available for the period from Q1 00 to Q3 11), the moving window is limited to two years, even though this period is too short to cover an entire business cycle. Nevertheless, the period appears meaningful for illustration purposes.

¹⁶ The number of combinations is $N(N-1)/2 = 136$, with $N = 17$ representing the sample size.

sum of both countries and the sum of all bilateral GDP totals (all from 2005). Above and beyond the comparison of mean values over various periods, we examine the connection between a specific country's business cycle and the euro area business cycle for all 17 euro area countries and again show the results in a chart to facilitate

analysis. This combination is supposed to show whether a particular country's business cycle has developed significantly differently since the crisis than that of the euro area. To determine the statistical significance of the potential deviation, we test the difference between two independent coefficients for each country.¹⁷

Box 1

Measurement of the Synchronization of Business Cycles: An Overview

To determine the synchronization of business cycles between individual EMU countries, we apply an HP filter to the GDP and industrial production time series to separate the trend component from the cyclical component. Whereas the trend component may be interpreted as the level of potential output, the cyclical component is the output gap, i.e. the fluctuation around the long-term trend.

Business cycles are synchronous if the cyclical components of two countries move upward or downward at the same time, and/or if the output gaps have the same value at a given time. Conversely, asymmetrical shocks refer to situations in which output gaps do not have the same value and/or in which the business cycles diverge. Asymmetrical shocks can affect either a particular country (e.g. a natural catastrophe) or all countries, but to different degrees (e.g. an oil price shock). After establishing the cyclical components, we calculate different synchronization measures:

- **Dispersion:** The dispersion of the output gap can be measured at any time using the standard deviation of the cyclical components. This synchronization measure makes it possible to assess whether the business cycles converge or diverge. However, the measure has one caveat that must be taken into account: Business cycles may be moving in opposite directions even if the size of the output gap is similar (and the dispersion consequently low).
- **Correlation:** The disadvantage cited above is taken into account in the second measure, the correlation coefficient. While the correlation coefficient measures the degree of linear connection between two simultaneous measures in two time series and thus measures the synchronization of business cycles, the absolute size of the output gap does not play a role, unlike in the case of the dispersion measure. Moreover, the correlation cannot be measured at any point in time, just for two time series (e.g. in moving time windows of two years' length). This synchronization measure is calculated either (1) from the average of the bilateral correlations of all country pairs, or (2) from the average of all correlation coefficients of the respective country and the euro area business cycle.
- **Cost of inclusion/Contribution of individual countries:** Finally, this indicator helps to assess the degree to which individual countries affect the results of the two measures. The term would appear to indicate that this variable is measured as a monetary variable; however, this is not the case: This indicator shows the percentage deviation of both synchronization measures if a country cycle is excluded from the sample. In the case of dispersion, the standard deviation falls if asynchronous countries are not taken into account in the analysis, whereas in the case of the correlation, the value will rise if these countries are excluded from the analysis. Those asynchronous countries (country pairs) that contributed most to the divergence of the business cycles can thus be identified.

¹⁷ The test statistic z is calculated as follows: $z = (Z_1 - Z_2) / \sigma_{z_1 - z_2}$, with $\sigma_{z_1 - z_2} = \sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}$, $Z_{1,2}$ referring to the Fisher-transformed correlation coefficients and $n_{1,2}$ representing the size of the respective sample. If the test measure is larger than $|1.96|$ ($\alpha = 0.05$), the difference is significant (Leonhart, 2009).

3 Empirical Findings

This section begins with a presentation of the results of the application of the methods described above to GDP data. After an overview describing the development of the synchronization measures in EMU since the adoption of the euro (section 3.1), the contribution of individual countries to synchronization is examined in section 3.2. In a next step, the degree of synchronization of the individual country business cycles with the aggregate EA-17 business cycle is analyzed. The different behavior of individual countries is highlighted before and after the outbreak of the financial crisis. To ensure that the results are robust, industrial output is also discussed in a brief digression (box 2).

3.1 Decline in the Synchronization of Business Cycles in the Euro Area

The empirical results are shown in charts 2 and 3. Chart 2 showcases the change in the dispersion of business cycles over time. Both the GDP-weighted and the unweighted standard

deviation (STD) exhibit a conspicuous rise that did not begin with the onset of the recession in the euro area in Q3 08, but already in early 2007. From Q4 06 to Q4 07, unweighted STD nearly doubled, and the weighted STD in fact even tripled in the comparable period. Whereas the weighted STD fluctuates at a high level before diminishing again in 2009, the unweighted STD exhibits two distinct peaks that may be considered to be linked to the development of the euro area business cycle (shaded area). Both peaks – the first in Q4 07 and the second in Q3 09 – coincide almost perfectly with the peak and the trough of the euro area business cycle. The unweighted STD dropped sharply when the turning point in the business cycle was reached in Q4 08, the time at which most countries experienced a decline in GDP growth and dipped into recession. Then, the unweighted STD resumed its increase to reach a new peak during the trough of the euro area business cycle.¹⁸ As the weighted STD is substantially lower than the

Chart 2

Dispersion in the Euro Area and the Euro Area Business Cycle



Source: Authors' calculations.

¹⁸ As the standard deviation can depend on the measuring unit, so that variables with large means have a greater variance, we performed a robustness analysis by calculating the variation coefficient (defined as the ratio of the standard deviation to the mean of the cyclical component in the respective period). The value 1 was added to the cyclical components first to prevent a division by zero. This relative dispersion measure shows the same deviation, which confirms the divergence trend.

Chart 3

Bilateral Correlation Coefficients in the Euro Area and the Euro Area Business Cycle



Source: Authors' calculations.

unweighted STD, notably since 2007, the rise in the dispersion is largely driven by the smaller countries. Nevertheless, the rise in both aggregates is significant. If the values of the respective variables are compared at four-quarter intervals, the difference between the weighted and the unweighted STD is significantly different from zero at three comparison points (at least at a significance level of 10%).¹⁹

To ascertain whether the rises in dispersion are not just simply an increase in amplitude but also a decrease in the synchronization of business cycles, we calculated the mean of the bilateral correlation coefficient in a moving two-year window; the result is shown in chart 3.²⁰ The chart reveals that in the period since 2006, the mean values declined at two instances, with a low in Q4 07 and in Q1 10. These declines occurred nearly simultaneously with the

rises in the dispersion of the business cycles. If, moreover, the unweighted mean of the bilateral correlations for the precrisis phase (Q1 00 to Q3 08) and for the period after the crisis (Q4 08 to Q3 11) are calculated without a moving window, a distinct drop in the mean may also be observed (from 1.2 to 0.9). To sum it up, it may be asserted that the euro area business cycles have desynchronized since the most recent financial crisis, with this trend beginning already during the boom phase in 2007.

Robustness Analysis

In this section, we analyze how many of the last quarters are affected by the end-of-sample bias and which of the results presented here are thus subject to uncertainty. The synchronization measures presented up to now are based on an estimate of the output gap

¹⁹ In the case of the unweighted STD, the comparison periods are Q3 05 to Q3 06; Q1 06 to Q1 07; and Q2 06 to Q2 07; in the case of the weighted STD, the periods are Q2 06 to Q2 07; Q3 06 to Q3 07; and Q4 06 to Q4 07. The presented test results are supposed to show that the visually perceptible rises since 2005 are partly significant changes. The exact comparison periods are less relevant and were thus chosen arbitrarily. The detailed results of the test statistics are available from the authors on request.

²⁰ The correlation coefficients are transformed to a normal distribution to enable a comparison of the means. Therefore, the mean may exhibit values above 1. The Fisher transformation for correlation coefficient r is calculated as follows: $Z = 0.5 \cdot \ln\left(\frac{1+r}{1-r}\right)$ (Leonhart, 2009).

using GDP data up to Q3 11.²¹ In the annex, charts 10 and 11 also show the dispersion of the business cycles if data only up to Q3 10 or Q3 09 are used to estimate the output gap. The dispersion using the unweighted STD is shown in chart 10 (annex); chart 11 (annex) shows the dispersion using the weighted STD. Both charts clearly indicate that uncertainty is especially prevalent in the last four quarters of the review period. Therefore, if the GDP data series had been available only until Q3 10, the rise in the unweighted STD at mid-2009 would have been underestimated; in the case of the weighted STD, it would have been overestimated.

By analogy, charts 12 and 13 (annex) depict the correlation coefficient. In the

case of the correlation measure, the uncertainty is much smaller. In other words, the inclusion of future GDP data to calculate the output gap would have hardly any effect on the course of the bilateral correlation coefficient. End-of-sample parameter instability thus has an impact above all on dispersion, but not on the synchronicity of the countries. The analysis allows for the conclusion that the results presented in the study based on data up to mid-2010 will not lose their validity on publication of future GDP data, whereas the results for the dispersion from mid-2010 are affected by high uncertainty. Therefore, from this time onward the evidence on the synchronization of business cycles is also subject to a degree of uncertainty.

Box 2

A Comparison of Monthly Data: The Synchronization of Industrial Production

A comparison of the analysis performed in section 3.1 with the monthly industrial production (IP) data serves as a test of the robustness of the results attained thus far.

The left panel of the chart in this box shows the dispersion of the cyclical components of industrial production of all euro area countries (excluding Malta) in the period from January 2000 to January 2012. The right axis depicts the aggregate euro area (EA-17) industrial cycle. IP is subject to higher volatility than the dispersion of the GDP cycles (section 3.1), as the data are monthly. However, if changes in the dispersion are analyzed over time, a pattern similar to that of the GDP cycles may be discerned. First, the unweighted STD fluctuates around a mean of about 2.2 percentage points until mid-2008, only to rise to more than twice that level until the end of 2008. The unweighted STD peaks at 5.5 percentage points in April 2009. Compared to the value in July 2008, which at 2.1 percentage points corresponds roughly to the average of the entire preceding period, this represents a statistically significant rise. This rise, however, is limited to the end of the recession period from end-2008 to end-2009 and unlike the dispersion of GDP cycles does not already start in 2007. The weighted STD of the industrial cycles displays a similar pattern, coming to an average of roughly 1.4 percentage points until mid-2008 and peaking at 4.1 percentage points in April 2009. Both dispersion measures decline again from end-2009 and return to their previous path.

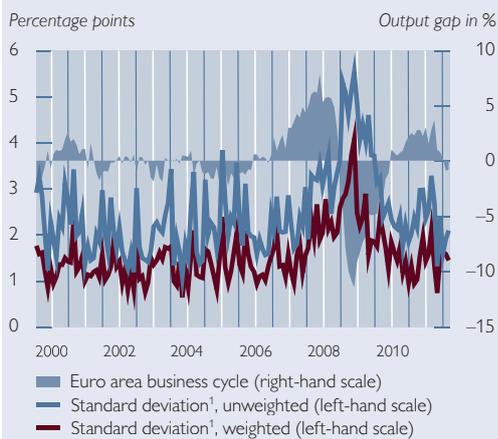
The right panel of the chart shows the weighted and unweighted means of the bilateral correlation coefficients (by analogy to chart 3 in section 3.1) of the industrial cycle in a moving two-year window that enables an estimate of the change in the synchronization of business cycles. A similar pattern emerges as that observed for the means of the GDP cycle correlation coefficients. The period characterized by a rise in dispersion (left panel) is also the period in which the mean correlation coefficients diminished (right panel). To conclude, both indicators

²¹ Data for Greece are available only until Q1 11; in other words, the dispersion in Q2 11 and Q3 11 excludes the Greek business cycle. However, this does not influence the ability to interpret the results, as the exclusion of Greece from the analysis merely has an insignificant impact on the course of the dispersion.

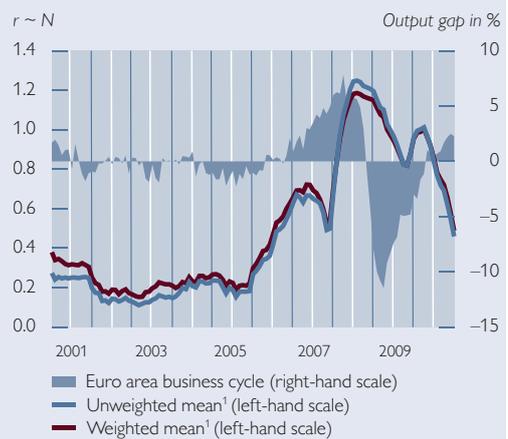
of the cyclical component of industrial production also indicate a reduction of the synchronization in the euro area, which, however, started only when the recession began at the end of 2008 and not, as is observable with the GDP cycles, in early 2007.

Industrial Production

Dispersion in the Euro Area and the Euro Area Business Cycle



Bilateral Correlation Coefficients in the Euro Area and the Euro Area Business Cycle (two-year window)

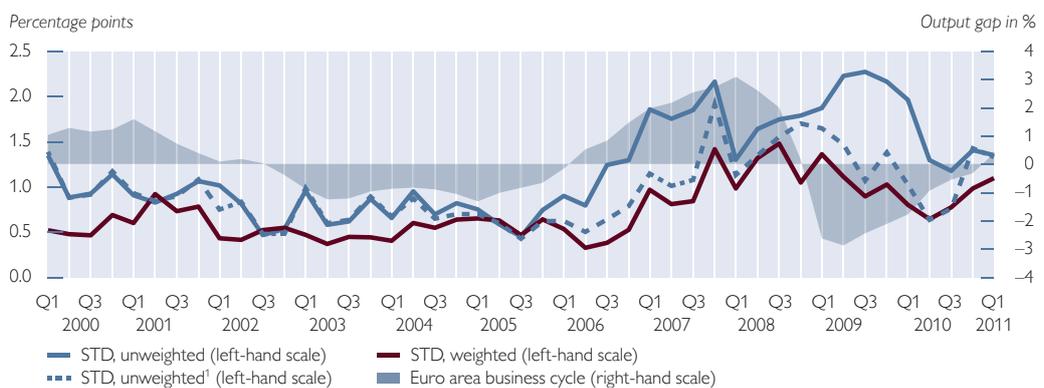


Source: Authors' calculations.

¹ Excluding Malta.

Chart 4

Dispersion in the Euro Area and the Euro Area Business Cycle



Source: Authors' calculations.

¹ Excluding Estonia.

3.2 Which Countries Contribute to the Synchronization of Business Cycles?

Section 3.1 showed that the synchronization of business cycles changed strongly during the crisis. The general rise in the standard deviation in the country cross-section was accompanied by a

decline in the mean of the bilateral correlation coefficients. Moreover, it is clearly discernible that the unweighted standard deviation is perceptibly higher than the weighted one. This suggests that the swings were driven above all by the smaller euro area countries. Chart 4 shows the familiar weighted

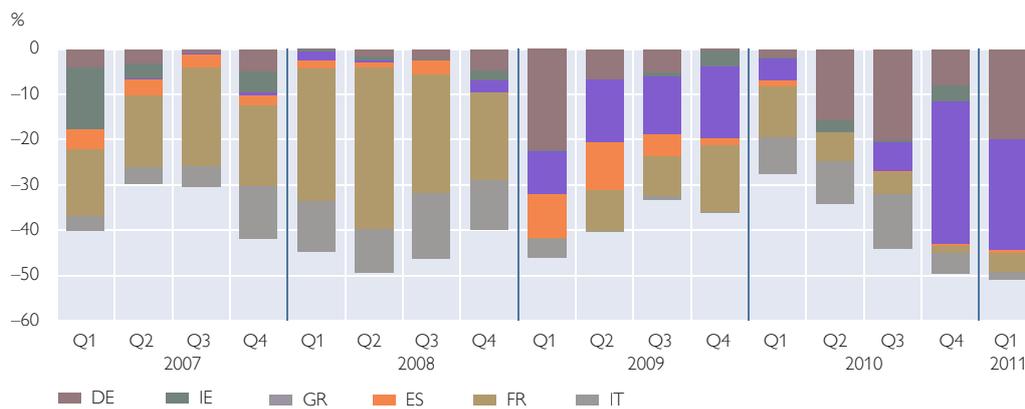
and unweighted dispersion of euro area business cycles. As the standard deviation is sensitive to possible outliers, the unweighted dispersion result may be very strongly influenced by a small country. The dotted line represents the dispersion of business cycles without Estonia (EA-16). Obviously, the unweighted dispersion is very strongly driven by Estonia, as the business cycle of Estonia diverges decisively from the euro area business cycle. In this connection, how-

ever, it must be emphasized that Estonia was not yet an EMU member at the time. The development is similar in other countries: The brief rise in the fourth quarter of 2007 (chart 4), for instance, is attributable mainly to a contrary development in Slovakia,²² also one of the countries that had joined the euro area shortly before.

This example shows that it is particularly important to identify the countries that contributed most to disper-

Chart 5

Change in the Weighted Standard Deviation Excluding Selected Countries



Source: Authors' calculations.

Chart 6

Business Cycles of Selected Countries



Source: Authors' calculations.

²² Section 3.3 describes the business cycles of the individual euro area countries.

sion, or to asynchronous developments, in the euro area. Whereas both weighted and unweighted analysis provide interesting insights depending on the question posed, the analysis below primarily focuses on the country contributions to the weighted dispersion, as above all this aggregate is important in the overall European perspective.

Chart 5 shows the change in the dispersion measured in terms of the standard deviation of the cyclical component under the assumption that the respective country in the analysis is not an EMU member. The change in the dispersion may be interpreted as the cost of including the respective country in EMU (Crespo Cuaresma and Fernández-Amador, 2010). At this point, we would like to point out once again that this indicator is not measured as a monetary variable; instead, it simply shows the percentage deviation of dispersion on exclusion of a country cycle from the sample. The six countries with the highest weight in the inclusion cost indicator are described below.

In other words, these are the countries that have driven up weighted dispersion most since early 2007. The analysis reveals some very interesting patterns. Prior to the outbreak of the crisis (roughly up to the fourth quarter of 2008), it was mainly France which caused the STD to rise. Apart from the deviation from the weighted mean of the cycles (corresponds to the euro area cycle; chart 6), France's high share in euro area GDP (the second-highest share following Germany) plays a decisive role. During this period, Italy also contributed to the divergence of business cycles. As the Italian business cycle showed only a marginal deviation

(chart 6), apparently the high weight of Italy (the third-largest euro area economy) was mainly responsible for its contribution. Although Ireland stands out most in terms of its cyclical component, this divergence had an impact only in the first quarter of 2007 because of Ireland's low GDP weight.

The pattern of the *inclusion cost indicator* appears to change noticeably once the recession takes hold at the end of 2008. Whereas France's indicator declines steadily, reflecting France's move toward the euro area average, above all Greece but also Germany display high inclusion costs. In other words, the inclusion of these countries' cycles result in a sharp rise in dispersion. At first glance, the patterns look similar (chart 5), but a closer look reveals nearly perfectly opposed patterns: While at the beginning of the crisis, Germany reacts more strongly than the other countries covered and has the largest negative output gap, the downturn starts much more slowly in Greece and does not produce a negative output gap until the beginning of 2010. An inverse pattern also characterizes both countries in the most recent quarters: Germany tended to recover faster than the euro area average and on account of its high weight posted a high inclusion cost indicator despite its fairly small dispersion. Whereas the inclusion cost indicator has high values in nearly all the large euro area countries,²³ the extraordinarily high value for Greece despite its very low weight²⁴ impressively signals the degree of financial distress that the debt crisis brought on for Greece. The recession takes a drastic course in Greece: From the outbreak of the crisis to end-2011, Greek

²³ The countries with the highest weights in euro area GDP (2005) are Germany (27.3%), France (21.1%), Italy (17.6%) and Spain (11.2%).

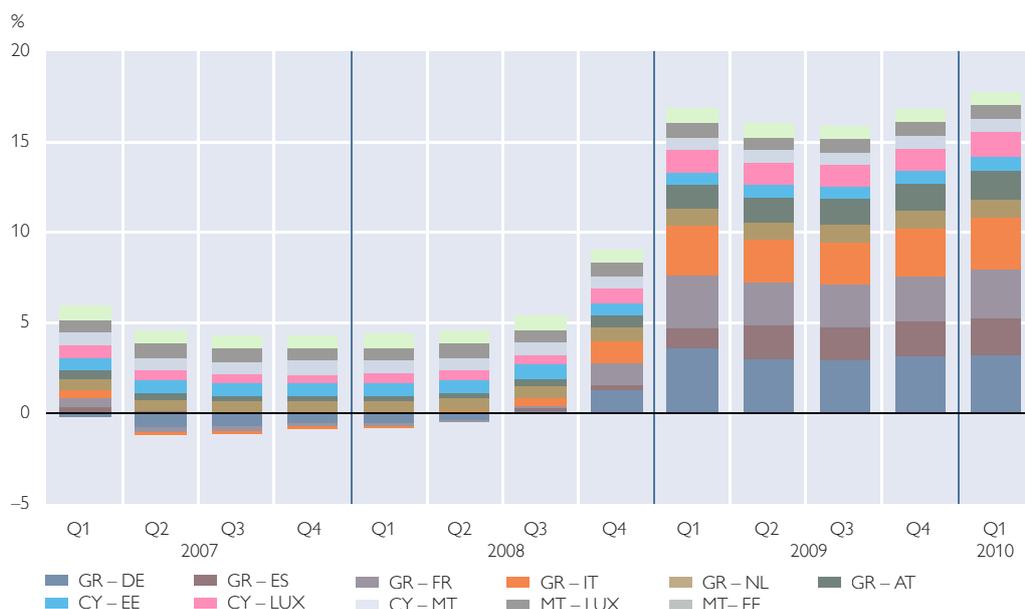
²⁴ According to the 2005 GDP data, Greece only accounts for 2.4% of euro area GDP.

GDP contracted by a total of some 11%, causing the business cycle to drift into negative territory. While the inclusion cost indicator for Greece still showed an upward deviation against the euro area for 2009, the opposite is the case after the third quarter of 2010. The differences between the dispersion measure (standard deviation) and the correlation of cycles are also readily identifiable in this example: In mid-2010, the Greek cycle was more or less equivalent to the European average (putting the Greek inclusion cost indicator at almost zero for the second quarter of 2010), only to develop in a completely opposite direction to the rest of Europe thereafter. Whereas euro area slowly recovered from the financial crisis, Greece felt the effects of the debt crisis all the more. This inverted tendency cannot be captured by the dispersion measure; it can only be shown using the correlation as a synchronization measure.

Therefore, like in the case of the dispersion measure, the change in the weighted mean of the correlations is analyzed, assuming that specific country pairs are excluded from the analysis. The results are summarized in chart 7. Like previous charts, chart 7 depicts selected countries, showing only the country pairs that had the greatest influence on the average weighted bilateral correlation factors in the euro area. Again, Greece dominates the picture: The bilateral correlations between Greece and Germany, France, Italy, Spain, Austria and the Netherlands would increase the (Fisher-transformed) correlation coefficients most if these country pairs were excluded from the analysis. This comes as no surprise: During the crisis, Greece's business cycle developed completely opposite to that in other countries. Together with the higher weights of the larger euro area countries, the development in Greece raises the average correlation

Chart 7

Change in the Weighted Mean of the Correlations Excluding Selected Country Pairs



Source: Authors' calculations.

coefficients most. By contrast, other country pairs deliver some surprising results: Although Estonia, Luxembourg, Malta and Cyprus range among the smallest economies in the euro area, their cyclical divergence has quite a strong impact in this analysis.

As the different weights in this analysis allow only limited conclusions about individual countries to be drawn, section 3.3 below examines the correlations of the individual countries with the euro area (EA-17) cycle. The correlations provide the basis for economic policy conclusions for the individual member countries. Whereas the literature mainly employed the OCA meta-criterion synchronization of business cycles to examine whether a hypothetical region was ready to join a currency area, the same line of argumentation may be applied to examine the euro area's fulfillment of this criterion ex post to determine deviations and take corrective economic policy action. Enforcing synchronization is basically what the new rules in the euro area apply by identifying macroeconomic imbalances between countries – e.g. divergent developments of unit labor costs, current account balances, inflation – and then suggesting adequate corrective measures in time.

3.3 Which Countries Follow the Euro Area Cycle?

Following the general overview of the synchronization of euro area business cycles using dispersion (standard deviation) and average bilateral correlation coefficients in section 3.1 and a first analysis revealing which countries con-

tribute to convergence and which ones contribute to divergence of business cycles in section 3.2, an additional dimension to the discussion is added in section 3.3. The correlation of the country-specific cycle with the euro area aggregate (EA-17) cycle reveals which countries, being particularly hard hit by asymmetric shocks, found participation in EMU to be the greatest challenge.

Chart 8 presents the correlations of the respective countries' business cycle for the entire period (Q1 00 to Q3 11) and for the periods preceding the crisis (Q1 00 to Q3 08) and following the crisis (Q4 08 to Q3 11). The crisis is generally determined to have begun in Q4 08 in the literature. GDP data for Greece are available only until Q1 11, but the correlations for all other countries were calculated for the period up to Q3 11 to keep the post-crisis sample as large as possible. An eyeball inspection of the aggregated chart indicates that in most of the countries, the crisis had little impact on the symmetry of the shock; the correlations before and after the crisis are largely unchanged.²⁵ There are exceptions, though: The correlation coefficient falls markedly in some countries during the crisis, notably in Spain, in Cyprus and Greece (statistically significant at the 5% level), but also in Slovakia, Slovenia and Portugal (though not to a statistically significant degree). As expected, Greece posted the most pronounced decline in symmetry; the correlation coefficient slips well into negative territory during the crisis. The symmetry measure drops sharply also for Cyprus, whose

²⁵ The post-crisis period is subdivided into a "Great Recession", whose onset was nearly simultaneous in all euro area countries, albeit at different strengths, and a subsequent recovery until at least mid-2011, which was quite heterogeneous in the individual member countries. The aggregation of these two periods to a single "post-crisis period" therefore conceals potential differences within the period, as the synchronization of cycles is particularly strong during the downturn but highly heterogeneous during the upswing. Because the time series is so short, it is difficult to quantify the structural break, but it should be taken into account in interpreting the results.

Chart 8

Correlation of Country Cycles with the Euro Area Cycle



Source: Authors' calculations.

¹ The correlation coefficients of the periods Q1 00 through Q3 08 and Q4 08 through Q3 11 differ significantly from one another (at the 5% level). Shorter period in GR: Q4 08 to Q1 11.

economy is closely tied to that of Greece. The statistically significant rise for Germany, which, however, is barely discernible in the chart, shows how important a standardization of the correlation coefficients is for the statistical analysis.

To better judge the developments over time, chart 9 presents the course of the correlations of country-specific cycles with the euro area cycle in rolling two-year windows (left panels). The respective cyclical component of the same countries (lines) and of the euro area (shaded area) are shown in the right panels. While fully describing all charts would exceed the limits of this study, some interesting details may be discussed representatively.

A look exclusively at the left panels clearly shows that the decline, or low

level, of the correlation coefficients around 2004, when the euro area's output gap was negative, spread to all countries,²⁶ admittedly with stronger declines in the correlation in some countries (e.g. Cyprus, Greece, Luxembourg, Malta and Slovakia) than in others (Austria, Belgium, Germany, Slovenia). Only Italy and the Netherlands registered barely any change during this period; the correlations with the euro area cycle remain comparatively high here. The decline in the correlations during the crisis, however, may be observed to be much more heterogeneous; it is driven by only a few countries. As in the mean bilateral correlations (section 3.1), two country groups predominate the decline in correlations with the euro area. The first of these declines is triggered by Cyprus and

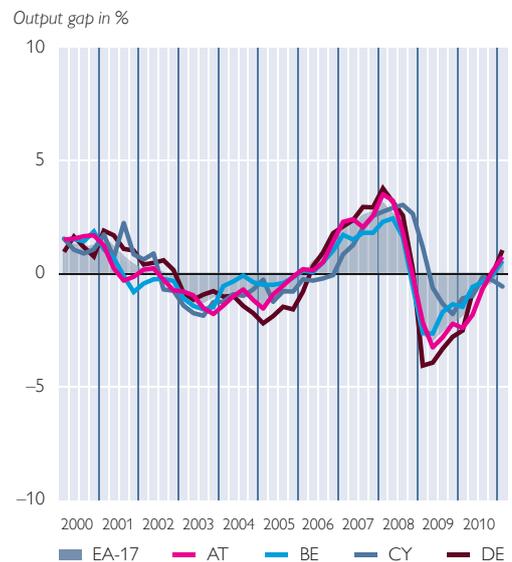
²⁶ Not surprisingly, the mean bilateral correlation coefficients in section 3.1 show a similar picture, though the perspective of the analysis is a different one: Whereas section 3.1 focuses on the bilateral correlations of countries among one another, chart 9 presents the respective correlations with the euro area aggregate.

Chart 9

Correlations with the Euro Area Cycle (1)



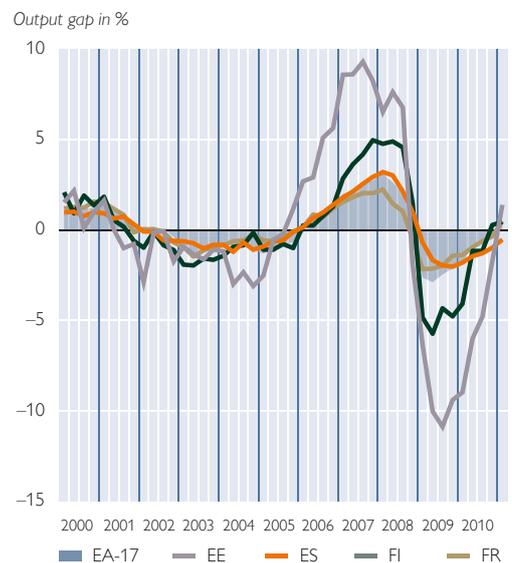
Selected Country Cycles and the Euro Area Cycle (1)



Correlations with the Euro Area Cycle (2)



Selected Country Cycles and the Euro Area Cycle (2)



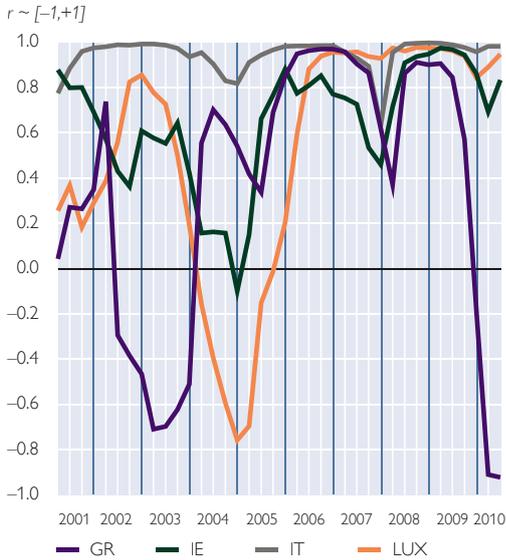
Slovakia, as well as Estonia, Greece, Ireland and Malta. The second reduction is characterized by a fall in the correlations to less than -0.9 in the case of Greece; this fall is further reinforced by Cyprus, Spain, Malta and Portugal.

Interesting differences can also be seen among the countries that had

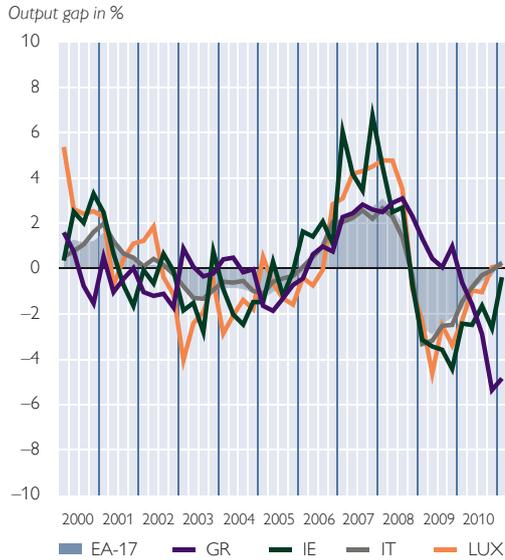
already drawn on financial support to counteract the sovereign debt crisis, notably Greece, Ireland and Portugal. Whereas at the beginning of the crisis, the downturn was far less pronounced in Greece than in the euro area aggregate, Greece slipped inexorably into recession toward the end of the sample

Chart 9 – continued

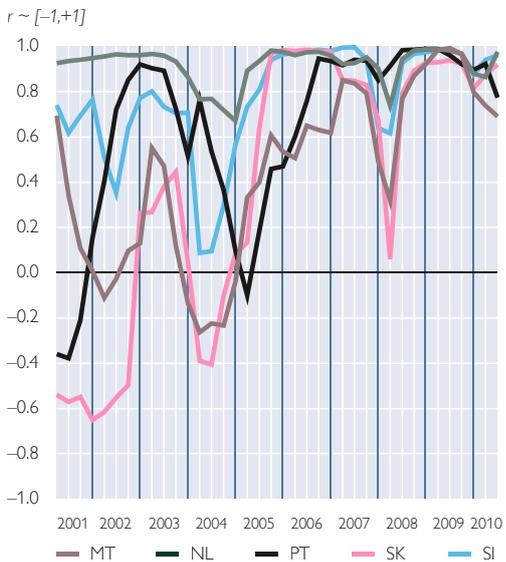
Correlations with the Euro Area Cycle (3)



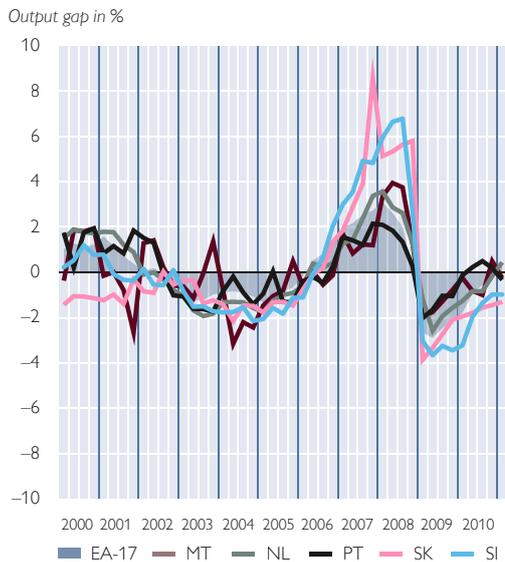
Selected Country Cycles and the Euro Area Cycle (3)



Correlations with the Euro Area Cycle (4)



Selected Country Cycles and the Euro Area Cycle (4)



Source: Authors' calculations.

and displayed the largest negative output gap. Ireland, too, remained below potential output. Nevertheless, unlike Greece, Ireland's synchronization with the euro area cycle hardly changed; at the end of the sample, its correlation coefficient remains very high at over 0.8; the value for Greece, by contrast,

is -0.9 . Toward the end of the sample, Portugal had nearly reached potential output, only to experience a decline in synchronization (to a correlation coefficient of about 0.7), which points to a weakening of economic activity.

Once again, the panels in chart 9 clearly show why the measure for the

synchronization of cycles (i.e. the correlation coefficient) and the dispersion measure (i.e. standard deviation) should complement one another. Whereas the decline in the correlation coefficients around 2004 is accompanied by fairly small deviations from the euro area cycle, the amplitude of the cycles during the most recent crisis are significantly higher; this, however, does not have a negative impact on all countries' correlation coefficients. For efficient monetary policymaking, it is not simply relevant whether the cycles tend to move in the same direction, but also how much they deviate from the respective other cycles.

The example which best illustrates this is the direct comparison between Estonia and Spain: While the swings of the Spanish cycle cover a smaller range (both during the boom and during the recession phase) than those of the euro area cycle, at the beginning of 2010, the correlation coefficients plummet nevertheless. The reason for this phenomenon is that the turnabout occurred later in Spain than in other countries, which in the end has a negative impact on the correlation coefficient.

While displaying a disproportionately large output gap (over 10% of potential output) at the outset, Estonia did not experience a strong impact on the correlation coefficient because the turnaround took place nearly at the same time as in all other countries. The sharp drop in the Greek correlation coefficient from 0.8 to around -0.9 is readily identifiable in the business cycle: Throughout most of the crisis period, the Greek economy reacted less strongly and posted a positive output gap for a long time. But the comparatively more powerful contraction of the Greek economy from early 2010 is obvious, as it occurred during a period

in which the output gap slowly began to contract again in other euro area countries.

4 Conclusions

This study examines the impact of the most recent financial and economic crisis on the synchronization of business cycles in the euro area. While an abundant literature analyzes the impact of the introduction of the euro on business cycle symmetry, the developments since the crisis have not yet been reviewed in detail. The results of the analysis show a pronounced desynchronization of business cycles during the crisis period, both with respect to dispersion and to the correlation of business cycles. Moreover, interesting differences and parallels may be observed between the developments since the beginning of the most recent financial crisis and an earlier period, around 2004, when the output gap in the euro area was negative as well.

The external shock that spread from the U.S.A. to the euro area when the financial crisis started to spread in 2008 appears to have impacted the real variables in the individual countries differently and thus to have led to a divergent development of the business cycles. The analysis of the dispersion measure shows, however, that the desynchronization already began in 2007 during the boom phase preceding the crisis rather than at the end of 2008 when the most recent recession emerged. It suggests itself that the size of the standard deviation of the cycles is influenced by the absolute size of the output gap. The output gap was just as large during the boom phase prior to the crisis as during the sharp recession, so that a maximum degree of dispersion was in fact identified for both periods. This pattern is also confirmed by an analysis of industrial

production data. Whereas the dispersion of industrial cycles also climbs strongly during the recession period, this was not the case during the preceding boom, as the cyclical peak was accompanied by a noticeably smaller absolute output gap than the cyclical trough in 2009.

Apart from the rise in dispersion, at the beginning of 2007 and 2009, the correlation coefficients of the GDP business cycles also diminished in the euro area. These declines occurred nearly simultaneously with the rises in dispersion. The same pattern may be observed for industrial production, where the decline in the correlation occurred hand in hand with a marked increase in dispersion.

The reduction of the correlations observed during the recession phase of 2009 was much smaller than during the 2004 period, when the output gap in the euro area was also negative. The reason was that in 2004, nearly all euro area countries experienced a decline in correlation measures; conversely, this was not the case during the recession phase of 2009. The renewed decline seems to have been triggered mainly by the countries hardest hit by the debt crisis, above all Greece. Because the absolute extent of the output gap was fairly small in the 2004 period, the decline in the correlation measures was not accompanied by a general rise in dispersion (i.e. the amplitude) of business cycles, unlike during the severe recession in 2009.

Subdividing the most recent crisis period into two stages – the “Great Recession” and the subsequent recovery (at least until mid-2011) reveals further country differences. Whereas most euro area countries were beset by the downturn at nearly the same time, the subsequent recovery started at different times in different countries, and was

weaker in some, stronger in others. The following dichotomy may offer an explanation: While the triggering events were the same, individual countries started from disparate starting points and reacted with different policies. During the “Great Recession” – emanating from the U.S.A. – a loss of trust occurred in the banking system across the world and paralyzed capital markets all over, but during the temporary recovery which followed, the substantially different debt levels weighed on individual countries to different degrees: Countries with less debt were able to successfully wield an expansionary fiscal policy to effect a change in trend, whereas the more heavily indebted countries had considerably less room for maneuver, thus slipping ever deeper into the crisis. These countries were additionally handicapped by structural weaknesses such as tax evasion, low competitiveness and real estate bubbles, which slowed the recovery in these countries even more.

The differences ascertained for the periods before and after the collapse of Lehman Brothers contain important implications for the single monetary policy in the euro area. In the time immediately after 2004, during which correlation coefficients declined but dispersion reacted only insignificantly, the individual euro area countries, while not far away from reaching potential output, did not display synchronized cycles. Hence, countries that have already overcome their low would need to pursue a contractionary monetary policy; optimally, the other countries should retain an accommodative monetary policy.

During the “Great Recession” from 2008, the difficulties of a single monetary policy appear in an entirely different light: The correlation coefficients declined during the crisis, but then

persisted at a fairly high level even though dispersion increased markedly. While the countries more or less concur on the direction of interest rate policy, above all the size of the steps to be taken were a matter of discussion. The recent decline in the correlations toward the end of the first sample (Q1 11) implies a rekindling of the debate. Some countries – e.g. Germany – embarked on a recovery more quickly, but others took much longer to overcome the cyclical trough. Of course,

given the parameter instability in estimating the cyclical component, there are limits to the robustness of statements about the synchronization of business cycles in the euro area at the end of the sample. As this study has been able to show, uncertainty about estimates of the output gaps from mid-2010 are high, so that the most recent developments cannot be analyzed with any certainty until the relevant GDP data have become available.

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Annex

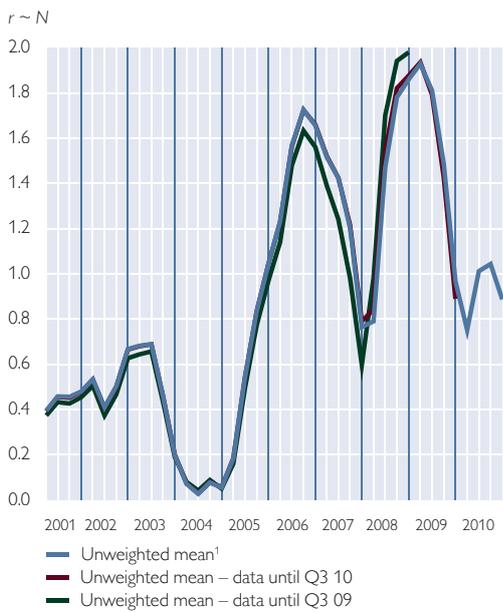
Chart 10

**Robustness Analysis:
Euro Area Dispersion**



Chart 12

**Robustness Analysis: Euro Area
Bilateral Correlation Coefficients**



Source: Authors' calculations.
¹ Q2 11 to Q3 11 excluding Greece.

Chart 11

**Robustness Analysis:
Euro Area Dispersion**

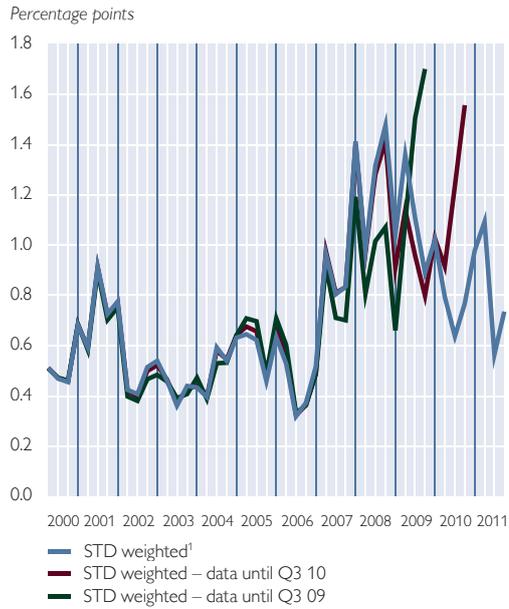


Chart 13

**Robustness Analysis: Euro Area
Bilateral Correlation Coefficients**



Table 1

Average Growth of Potential Output

	Q1 01 to Q3 11	Q1 01 to Q3 08	Q4 08 to Q3 11
	<i>Annual change in %</i>		
Austria (AT)	1.8	2.0	1.0
Belgium (BE)	1.5	1.8	0.8
Cyprus (CY)	2.8	3.4	1.3
Germany (DE)	1.1	1.2	0.9
Estonia (EE)	3.7	5.7	-1.3
Spain (ES)	2.1	2.9	-0.1
Finland (FI)	2.0	2.7	0.3
France (FR)	1.3	1.6	0.3
Greece (GR)	2.5	3.5	-0.7
Ireland (IE)	2.5	4.0	-1.6
Italy (IT)	0.4	0.9	-0.8
Luxembourg (LU)	2.9	3.8	0.7
Malta (MT)	1.8	1.7	1.9
Netherlands (NL)	1.5	1.9	0.7
Portugal (PT)	0.7	1.0	-0.2
Slovakia (SK)	4.6	5.2	3.1
Slovenia (SI)	2.7	3.7	0.1

Source: Authors' calculations.

Analyzing Corporate Loan Growth in Austria Using Bank Lending Survey Data

Conceptual Issues and Some Empirical Evidence

This paper contributes to the emerging literature that makes use of Bank Lending Survey (BLS) data to shed light on the determinants of the growth of loans to enterprises. We examine the relationship between loan growth and information from the BLS using Bayesian model averaging. Our results suggest that in Austria volumes of corporate loans mainly react to changes in demand whereas supply effects play only a minor role. Moreover, the current crisis did not impair bank lending to enterprises beyond its influence on credit standards and loan demand. We find no indication for a credit crunch as defined by Bernanke and Lown (1991) in Austria. The evidence is less clear with regard to the broader definition of credit crunch by Owens and Schreft (1993) that also takes into account non-price conditions. In addition, this paper discusses the concept of credit standards and some methodical issues that have to be taken into account when using BLS data to analyze loan developments.

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JEL classification: C23, E51, G21

Keywords: credit, lending standards, loan demand, bank lending survey

With the onset of the current crisis, the growth of bank loans to nonfinancial corporations slowed down markedly in Austria – as in most other euro area countries –, and for some time, the volumes of outstanding loans even declined. In the face of this strong deceleration of loan dynamics, the question arises whether this slowdown has been caused mainly by lower demand or by reduced loan supply (and, regarding the latter, to what extent such a reduction constitutes a “credit crunch”). The identification of supply and demand aspects in the loan market has been treated broadly in the literature. However, disentangling supply and demand factors in empirical work is still constrained by the lack of suitable data.

This paper intends to contribute to the emerging literature that makes use of lending surveys to shed light on this issue. More specifically, we analyze the impact of supply and demand on the

development of loans by Austrian banks to enterprises in the euro area using the Austrian results of the euro area Bank Lending Survey (BLS).² The BLS aims to provide qualitative information on the lending relationship between banks and the nonfinancial private sector (firms and households) in two ways. On the one hand, it provides timelier information on loan market developments than the monthly bank balance sheet reports. On the other hand, it facilitates the analysis of supply and demand conditions in the loan market, which the statistical data reported by banks do not reveal directly. It is the latter aspect that this paper wants to make use of. The BLS requires the credit managers of leading banks to regularly provide an assessment of their credit standards, which here – as in other studies that examine the BLS and its U.S. counterpart, the Senior Loan Officer Survey (SLOOS) – will

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² Banks are considered “credit institutions” according to the MFI statistics, which define credit institutions as undertakings whose business is to receive deposits or other repayable funds from the public and to grant credits for their own account. “Enterprises” refer to nonfinancial corporations according to the European System of National and Regional Accounts (ESA 95).

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be interpreted as loan supply, and of the loan demand they face. Therefore, the BLS should be able to make a significant contribution to understanding the dynamics of loan aggregates.

One of the problems most studies in this field have to cope with is the shortness of the relevant time series. This holds not only for the BLS, which started in January 2003 (covering the fourth quarter of 2002), but also for the SLOOS. Although the Federal Reserve System's survey has a longer history than the BLS, the time series that some papers employ with respect to the SLOOS are not much longer than those that can currently be derived from the BLS because there were numerous changes in the design of the SLOOS questionnaire (Schreft and Owens, 1991).³ Regarding BLS data, the ECB recently published a number of studies on the euro area.⁴ Since the ECB has access to individual country data, these studies use a cross-country panel consisting of all countries that take part in the BLS in order to enlarge the number of observations and circumvent the limits deriving from the relative shortness of the BLS sample period. The time series that began in January 2003 has recently become long enough to allow for a first econometric analysis at the national level. Hence, the first papers using national BLS aggregates have emerged (Deutsche Bundesbank (2009) for Germany; Lacroix and Montornès (2009) for France). Del Giovane et al. (2011) and Blaes (2011) use the individual responses from larger national BLS samples (Italian and German,

respectively) to assess the relative role of supply and demand factors behind bank lending to enterprises.

This paper contributes to the literature in the following ways: It is the first systematic empirical analysis of the Austrian BLS results and one of the first to study national BLS results. Moreover, it is one of the first empirical studies on the determinants of corporate loans in Austria since the onset of the crisis and thus contributes to the discussion on whether a credit crunch has been at work in Austria or not. Methodically, to the best of our knowledge, this is the first paper that uses Bayesian techniques to cope with the uncertainty arising from the limited a priori knowledge on how exactly the BLS variables affect loan growth.

This paper is organized as follows: Section 1 briefly discusses the BLS objectives and methodology as well as the representativeness of BLS results. Starting from there, section 2 explores the concept of credit standards in more detail. Section 3 discusses some conceptual issues that must be taken into account when using the BLS to analyze loan developments. Our empirical analysis is presented in section 4. Section 5 concludes.

1 The Bank Lending Survey

The Bank Lending Survey (BLS) has been conducted since January 2003. It addresses high-ranking credit managers at leading banks all over the euro area, asking them each quarter to provide their assessment of different aspects of credit standards, credit conditions and

³ For example, Lown et al. (2000) use data ranging from the third quarter of 1990 to the fourth quarter of 1998 (as well as from the third quarter of 1973 to the first quarter of 1984), and the time series employed by Lown and Morgan (2006) is not much longer, ranging from the second quarter of 1990 to the second quarter of 2002. Cunningham (2006) as well as Bayoumi and Melander (2008), who look at SLOOS data a few years later, have a longer time series at hand (from the second quarter of 1991 to the third quarter of 2007).

⁴ De Bondt et al. (2010); Ciccarelli et al. (2010); Hempell and Kok Sørensen (2010); Maddaloni and Peydró (2011).

loan demand. Since the BLS has a euro area-wide scope, all questions in the survey refer to loans granted to euro area residents in general. The BLS is based on a standard questionnaire consisting of 18 questions. Seven questions concern loans to enterprises, ten questions refer to loans to households (split into loans for house purchase and consumer loans/other lending) and the last question is an open question intended to capture those credit market developments that might not have been covered by the preceding questions.

The breakdown by sector and purpose essentially follows the MFI balance sheet items (BSI) statistics. In the case of loans to enterprises, questions on credit standards and loan demand are further broken down by loan maturity (short-term, i.e. with an original maturity of up to one year, and long-term) and enterprise size (large versus small and medium-sized enterprises, with the division line being an annual net turnover of EUR 50 million). For each of these loan categories, the respondents assess credit standards and loan demand, both in a backward-looking (over the previous three months) and a forward-looking (expectations over the following three months) manner. Hence, the first survey in January 2003 asked respondents to assess the developments in the fourth quarter of 2002 and to give their expectations for the first quarter of 2003. For total loans to enterprises, respondents are asked to detail the factors that have affected credit standards and loan demand and to indicate how the terms and conditions for approving loans have changed. For credit standards, the factors the questionnaire takes into account are the cost of funds and balance sheet constraints (cost of capital, access to market financing and the banks' liquidity position), pressure from competition

(from competing banks, nonbanks and market financing) and the respondent banks' perception of risk (expectations regarding general economic activity, industry or firm-specific outlooks and the risk on required collateral). In 2008, the questions on the factors affecting credit standards and those on terms and conditions were enhanced by a breakdown by enterprise size. Apart from that, the main set of questions has remained unchanged throughout the survey period. However, numerous ad hoc questions have been added to the regular questionnaire, particularly since the onset of the crisis.

In the BLS questionnaire, credit managers are asked to indicate their estimates on a five-point scale ranging from "eased considerably" to "tightened considerably" for the questions concerning credit standards and from "decreased considerably" to "increased considerably" for the questions on loan demand. As it requests qualitative information on quarter-on-quarter changes, the BLS does not allow for drawing any conclusions about the absolute levels of credit standards and loan demand.

The sample of banks covered by the BLS was designed to reflect the respective national banking markets as well as possible while at the same time keeping the number of banks in the country samples as small as possible. In Austria, five banks were selected for the BLS sample, a number that is comparable to that of other countries of approximately the same size (Berg et al., 2005; Waschiczek, 2003).

2 Credit Standards and Loan Demand

In the guidelines for the completion of the BLS questionnaire that are sent to participating banks' loan officers every quarter, credit standards are defined as "(...) the internal guidelines or criteria

which reflect a bank's loan policy. They are the written and unwritten criteria, or other practices related to this policy, which define the types of loan a bank considers desirable and undesirable, the designated geographic priorities, the collateral deemed acceptable and unacceptable, etc."

This means credit standards are those universal guidelines banks have in place for all potential borrowers at a given time. Thus, credit standards reflect a bank's ability and willingness to take on risks (= its risk attitude) as well as its business policy toward different sectors, industries, regions or risk categories or, in other words, they show what type of customer a bank wants as borrowers. Therefore, standards may well differ for potential borrowers from different sectors with the same perceived riskiness if a bank wants to expand its loan portfolio toward one particular sector. Conversely, a bank's risk attitude may change over time, so that credit standards may differ at different points in time for firms that constitute the same risk.⁵

In operational terms, credit standards include the written statements on how to arrive at a credit decision as well as oral communications and long-standing practices within banks that are not formally laid down in writing. They comprise all steps of the credit allocation process, ranging from the evaluation of the loan applicant (e.g. credit scoring models) and the project that is to be financed to the bank's internal loan approval process. Therefore, a change in credit standards can take various forms: It may mean switching to another risk assessment model, deciding to raise or to lower the loan

volume threshold up to which loan decisions may be taken at the individual hierarchical levels within a bank, etc.

A change in credit standards may have different consequences. Tighter credit standards, for example, may find their expression in reduced loan volumes, higher interest rates or in tighter non-interest terms such as fees, collateral requirements, covenants and other elements (e.g. size, maturity, access conditions, etc.) or – as is likely in most cases – a combination of some of these factors. The actual terms and conditions pertaining to a loan, however, do not only reflect credit standards but also loan demand, as the terms of a loan contract are negotiated between the two parties involved and may therefore differ from what the bank (or the borrower) had in mind at the start of the negotiations. It may even be that credit standards are not implemented in an actual loan contract at all if the borrower considers the terms of such loan too disadvantageous or if the credit standards imply that the bank does not want to grant any new loans at all to borrowers in a specific sector or region.

There are two different views as to the reasons why credit policies fluctuate over time. One view relates changes in credit standards exclusively to bank-inherent factors. Such internal causes include a bank's funding position and other possible balance sheet constraints as well as changes in its credit allocation process. According to this view, credit standards are set independently of borrowers' creditworthiness and therefore, changes in credit standards can be interpreted as "pure credit supply effects" (Ciccarelli et al., 2010). This view complies with the widely

⁵ In this context, it must be noted that a distinction must be made between the risk attitude of a bank and the credit risk that a borrower constitutes.

used definition of a credit crunch by Bernanke and Lown (1991), according to which a credit crunch is a significant leftward shift in the supply curve of bank loans, holding constant both the safe real interest rate and the quality of potential borrowers.

Alternatively, credit standards can also change with the credit risk that is associated with a borrower (both the actual credit risk as well as that perceived by the bank involved). This view corresponds to Owens' and Schreft's (1993) definition of a credit crunch as "a period of sharply increased non-price rationing (...) that involves a discontinuous increase in the use of credit rationing (...) that may (but need not) be independent of any change in borrowers' risk profile." However, a tightening of standards may manifest itself not only in non-price terms but also in higher interest rates or higher interest rate margins that exceed a certain reference rate (e.g. the policy rate or the money market rate).⁶ The BLS allows for analyzing both concepts of a credit crunch as it contains information on the determinants of changes in lending standards. Considering these determinants, a change in granting loans constitutes a change in credit standards no matter whether it is motivated by a bank's internal factors or by an altered (perception of) risk associated with a certain borrower.

In contrast to credit standards, loan demand is not defined in the BLS guidelines. Usually, demand is defined as the quantity of a good or service a market participant is willing and able to buy at a given price, all other things being

equal. In the context of corporate loans which are taken out to finance investment projects, enterprises will be willing and able to pay if the (expected) net present value of that project is higher than the (discounted) costs entailed by the price and non-price terms and conditions of the loan. From this relation, two specific characteristics of loan demand arise: On the one hand, the ability to pay entails a considerable degree of uncertainty concerning the assessment of the viability of the project that is to be financed. On the other hand, loan demand is not independent of the credit policies of the banking sector. Insofar as the level of interest rates (and other terms and conditions) depends on banks' loan policy, a change in credit standards can affect loan demand. Operationally, loan demand is not confined to formal loan applications but may also include other information on loan demand that loan officers collect.

3 Using BLS Data for Analysis: Data and Conceptual Issues

This paper is based on those Austrian results of the BLS⁷ for which corresponding data for loans are available in the BSI statistics. We use data from the beginning of the survey (i.e. including the fourth quarter of 2002) up to and including the fourth quarter of 2011. This means that there are 37 data points available for our analysis. As the BSI statistics do not provide a breakdown of loans by firm size, we analyze total loans to enterprises as well as short- and long-term loans. In conformity with the euro area-wide scope of the BLS, loans refer to loans by all Austrian

⁶ In terms of the monetary transmission mechanism, the first category (when banks tighten/ease their credit standards because of bank balance sheet constraints) can be thought of as the bank lending channel and the second one (when credit standards follow banks' risk perceptions) as the balance-sheet channel.

⁷ The Austrian results of the BLS are available at www.oenb.at/en/img/dl_umfrage_zum_kreditgeschaefte_im_euroraum-oesterreich_ergebnisse_tcm16-19007.zip.

credit institutions to nonfinancial corporations in the euro area.

In principle, the BLS requests information on loan categories along the definitions of the BSI statistics. However, due to some conceptual differences, changes in credit standards or loan demand need not necessarily result in changes of loan volumes as reported in the BSI data, even if all other things remain equal. For one thing, changes in credit standards and loan demand influence gross new lending by banks. However, BSI data only report stocks of loans which means that the only changes that can be analyzed on the basis of BSI data are changes in stocks. To allow for calculating net transactions, the ECB adjusted these changes in stocks for reclassifications, revaluations, exchange rate and other non-transaction changes. However, these adjusted data do not account for redemptions.⁸ A possible alternative could be using the MFI interest rate statistics, which feature data on loan volumes for new business. However, because these statistics are compiled with the aim of capturing interest changes as closely as possible, the definition of new business goes beyond gross new lending in order to include new negotiations and agreements on existing loans between customer and bank. Therefore, we decided to use data on net transactions for our analysis. To calculate the quarterly growth rate of loan volumes, we use seasonally adjusted values of both net transactions (in the numerator) and outstanding loan volumes (in the denominator).

Another issue to consider in this context is that the BLS survey question on credit standards refers to both loans and credit lines, while the BSI

only covers outstanding loan volumes (= used credit lines). An easing of credit standards may result either in new loans or in new (or extended) credit lines; in the BSI loan data, the latter do not show up until the lines are actually used. Conversely, a tightening of credit standards may result in lower credit lines, but as long as credit lines are higher than the loan volumes drawn, this does not show up as a loan reduction in the BSI data. Along the same lines, credit standards refer not only to approved loans but to all loan applications, and lower loan demand may also lead to cuts in unused credit lines which, in turn, will not show up as a reduction in disbursed loans.

Our analysis is based on the aggregate BLS survey answers received from all banks in the Austrian sample. Answers are aggregated using a diffusion index which weights the response option “somewhat” by 0.5 and the response option “considerably” by 1. This is also the way the OeNB regularly publishes the national results of the BLS survey. Of course, the choice of these weighting factors is somewhat arbitrary. Alternatively, an analysis might be based only on the difference between the percentage of banks reporting a tightening of lending standards and the percentage of banks reporting a softening of credit standards (“net percentage”), but this would mean disregarding the degree of tightening indicated by the reporting banks. However, this metric, which the ECB employs in its regular reports, is not completely free of arbitrariness, either, as it can be thought of as a diffusion index which assigns the same weight to both a slight and a considerable tightening (or easing) of credit standards. Therefore, the

⁸ Since the beginning of 2009, the OeNB collects data on gross volumes of new loans and of credit lines to enterprises and households. However, currently the time series are still too short for empirical analysis.

same problem of discretion as to the weighting of answers arises while at the same time the additional information about the different degrees of tightening (easing) is lost. Moreover, from a more practical point of view, the diffusion index allows for a higher granularity of the possible values of the time series. With n banks in the sample, using net percentages yields $(2n+1)$ possible results, whereas the diffusion index yields almost twice as many $(4n+1)$. This is especially relevant in the case of Austria, where the sample size is small.

Previous papers have looked at aggregate time series as well as at the individual responses of banks participating in the respective surveys. Studies that explore microeconomic issues tend to use banks' individual responses.⁹ Papers that address macroeconomic questions focusing on the development of the overall loan aggregates and their determinants mostly use national aggregates. While from an econometric point of view, it might be tempting to use banks' individual responses as a sample and to match their answers with data on their lending, at least in the Austrian case conceptual concerns discourage such an approach. The BLS has been designed to yield results on an aggregated basis (and not to monitor the lending behavior of individual banks). Therefore, the Austrian panel in the BLS has been put together in order to obtain an aggregated time series that is representative of the national banking system. As the number of banks in Austria is very high by international comparison while at the same time the number of Austrian

banks included in the BLS has to be kept low given the small size of the Austrian market, the coverage ratio of the Austrian sample is rather low. Additionally, time series on loan developments at the individual bank level have been distorted over the past years by mergers and acquisitions as well as split-ups and reorganizations that took place within the respective banking groups.

4 Empirical Analysis

4.1 Descriptive Analysis

The average quarterly growth rate (seasonally adjusted) of loans (all maturities) by Austrian banks to nonfinancial corporations amounted to 1.0% over the entire sample period (table 1 and chart 1). Splitting our sample in a pre-crisis (Q4 02 to Q2 08) and a crisis (Q3 08 to Q4 11) subsample, we observe higher average growth rates (1.2%) in the pre-crisis period than in the crisis period (0.7%). The same pattern holds for long-term loans (1.7% before versus 1.2% after the onset of the crisis) while short-term loans fell, on average, during the crisis (−0.6%) and grew only moderately before (+0.3%).¹⁰ In 2003, the first full year of the sample period, loans to enterprises fell almost as strongly as at the height of the crisis in 2009 (−0.15% versus −0.24%, measured by average quarterly rates).

Banks tightened their credit standards for corporate loans in 21 quarters, eased them 6 times, and left them unchanged in 10 quarters. In relative terms, tightening was more frequent before (15 out of 23 quarters) than after

⁹ A case in point is Berger and Udell (2004), who applied bank-level information of U.S. banks' lending standards to test their institutional memory hypothesis on the behavior of bank loan officers as an explanation for the procyclicality of bank lending. In the same vein, Bassett et al. (2011) use bank level data from the U.S. survey to measure loan supply shocks.

¹⁰ Note that these results are sensitive to the exact definition of the crisis period. If the third quarter of 2007 is defined as the onset of the crisis, the growth of total and long-term loans is higher in the crisis period.

Table 1

Descriptive Statistics – Austria

	Loans (growth rate in %)			Standards			Factors			Demand		
	Total	Short-term	Long-term	Total	Short-term	Long-term	Cost of funds and balance sheet constraints	Competitive pressure	Risk perception	Total	Short-term	Long-term
<i>Whole period (Q4 02 to Q4 11, n = 37)</i>												
Unchanged, %	0.00	0.00	0.00	27.03	29.73	45.95	24.32	37.84	10.81	29.73	24.32	21.62
Tightened ¹ , %	16.22	51.35	5.41	56.76	37.84	45.95	54.05	8.11	45.95	48.65	43.24	29.73
Eased ¹ , %	83.78	48.65	94.59	16.22	16.22	16.22	21.62	54.05	43.24	21.62	32.43	48.65
Minimum	-0.92	-5.06	-1.96	-0.50	-0.50	-0.60	-0.47	-0.03	-0.50	-0.30	-0.40	-0.40
Maximum	3.71	4.59	3.75	0.10	0.10	0.20	0.10	0.17	0.17	0.20	0.20	0.30
Median	0.62	-0.10	1.33	-0.10	0.00	0.00	-0.03	0.03	0.00	0.00	0.00	0.00
Mean	1.03	-0.00	1.47	-0.09	-0.04	-0.10	-0.06	0.03	-0.07	-0.05	-0.04	0.03
Standard deviation	1.25	2.45	1.24	0.15	0.14	0.18	0.12	0.05	0.17	0.12	0.13	0.16
<i>Pre-crisis period (Q4 02 to Q2 08, n = 23)</i>												
Unchanged, %	0.00	0.00	0.00	13.04	30.43	43.48	21.74	30.43	8.70	30.43	26.09	17.39
Tightened ¹ , %	13.04	39.13	8.70	65.22	34.78	47.83	56.52	8.70	43.48	34.78	43.48	17.39
Eased ¹ , %	86.96	60.87	91.30	21.74	34.78	8.70	21.74	60.87	47.83	34.78	30.43	65.22
Minimum	-0.92	-5.06	-1.96	-0.30	-0.30	-0.50	-0.23	-0.03	-0.43	-0.20	-0.20	-0.10
Maximum	3.53	4.59	3.53	0.10	0.10	0.20	0.07	0.17	0.17	0.20	0.10	0.30
Median	0.89	0.82	1.97	-0.10	0.00	0.00	-0.03	0.03	0.00	0.00	0.00	0.10
Mean	1.24	0.34	1.65	-0.08	-0.02	-0.08	-0.04	0.04	-0.04	-0.01	-0.03	0.10
Standard deviation	1.32	2.56	1.38	0.12	0.12	0.15	0.08	0.05	0.15	0.11	0.11	0.13
<i>Crisis period (Q3 08 to Q4 11, n = 14)</i>												
Unchanged, %	0.00	0.00	0.00	50.00	28.57	50.00	28.57	50.00	14.29	28.57	21.43	28.57
Tightened ¹ , %	21.43	71.43	0.00	42.86	42.86	42.86	50.00	7.14	50.00	71.43	42.86	50.00
Eased ¹ , %	78.57	28.57	100.00	7.14	28.57	7.14	21.43	42.86	35.71	0.00	35.71	21.43
Minimum	-0.78	-4.38	0.20	-0.50	-0.50	-0.60	-0.47	-0.03	-0.50	-0.30	-0.40	-0.40
Maximum	3.71	3.15	3.75	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.20	0.10
Median	0.55	-0.66	0.94	0.00	0.00	0.00	-0.03	0.00	-0.03	-0.10	0.00	-0.05
Mean	0.69	-0.58	1.16	-0.11	-0.07	-0.14	-0.09	0.02	-0.11	-0.11	-0.05	-0.08
Standard deviation	1.09	2.22	0.95	0.19	0.18	0.22	0.16	0.03	0.19	0.10	0.17	0.15

Source: OeNB.

¹ For loan growth, "tightened" refers to a drop in loans and "eased" to an increase.

the onset of the crisis (6 out of 14 quarters). However, measured by the average diffusion index, (net) tightening was somewhat stronger during the crisis (-0.11) than before (-0.08). Standards for long-term loans were tightened more frequently and to a somewhat stronger degree than standards for short-term loans.

According to the BLS, loan demand fell slightly in all but two years (2006 and

2007). Overall, we observe a net drop in demand for total loans and short-term loans and a slight increase for long-term loans. Demand for loans across all maturities decreased during the crisis period. This drop was most pronounced in the first year of the crisis. According to the BLS responses to the question on demand factors, companies' financing needs affected loan demand more than the use of alternative finance.

Total Loans Granted to Enterprises

Loan Growth

Change against previous quarter, seasonally adjusted



Credit Standards and Loan Demand

Diffusion index



Factors Affecting Credit Standards

Diffusion index¹



Source: OeNB.

¹ Mean of individual underlying factors.

4.2 Modeling Framework

In our analysis, we regress the seasonally adjusted quarterly growth rate of loans to enterprises on the BLS supply and demand variables. For this purpose, we employ an autoregressive distributed lag model, i.e. the explanatory variables are composed of lagged values of both the dependent variable and the independent variables. Lags are included because, given the nature of credit standards, it can be expected that there is some time lag between the moment when a bank takes the strategic decision to change its credit standards or enterprises express their loan demand and the time when this is reflected in the loan data reported by the bank.

For one thing, this time lag has purely operational reasons. It may take some time between the decision-taking by the responsible bodies within a bank and the actual implementation of the decisions by staff dealing with customers in bank branches. Additional time is

required to process loan applications, to arrange the loan and finally to pay out the funds and record the claim on the banks' balance sheet. Moreover, credit standards may affect credit lines before they affect actually disbursed loans. For example, a tightening of lending standards may lead to a cut in credit lines. If such a reduction is below what the customer has actually drawn, the actual amount outstanding may be unaffected. To complicate matters further, the lag between a change of standards and the resultant change of outstanding loans need not be constant. As pointed out above, a change in lending standards need not lead to a change of the quantity of loans granted, but it can also affect their price, which is the interest rate charged, and other non-interest rate terms and conditions. Therefore, two equivalent episodes of e.g. tightening may have different effects on loan growth. As a final point, loan demand may affect loan volumes differently at different points in time (e.g. at

different points of the business cycle) so that the same degree of tightening may have different effects. For the purpose of estimation, a crucial point is how many lags to consider at most in the model as the number of parameters to be estimated increases with the number of lags. We allow for a maximum number of three lags because it seems reasonable that it should not take more than three quarters of a year until changes in standards or demand become visible in actual loan developments.

We estimate two specifications: Specification 1 takes the information on loan supply in the BLS into account by including the diffusion index for the change in banks' credit standards as applied to the approval of loans or credit lines. Specification 2 should help gain additional insights into the role of supply-side factors by using the survey questions on the factors affecting credit standards (as described in section 1). This should allow for distinguishing between the pure credit supply view of loan cutbacks and the broader notion that also accounts for changes in risk. In this respect, Hempell and Kok Sørensen (2010) find for the euro area, and Del Giovane et al. (2011) for Italy, that both capital constraints and banks' risk perceptions exert a significant (negative) influence on loan growth. For Germany, Blaes (2011) shows that the bank-related supply factor helps explain the slowdown in lending during the crisis period. To incorporate these factors in our analysis and at the same time limit the number of explanatory variables, we condense the data on the factors that affect credit standards by using principal component analysis

(Hempell, 2007; Blaes, 2011). By doing so, we were able to extract one factor related to balance sheet constraints (variable: "balance sheet") and one factor that reflects risk considerations (variable: "risk"). However, factor extraction with respect to competition was not successful, probably due to the low variation in this variable. Consequently, in addition to the demand variable specification 2 includes the risk and balance sheet variables. Note that we estimate specification 2 for all maturities, even though the BLS question on factors affecting credit standards refers to total loans.

One of the aspects that every analysis of loan developments covering the past few years has to take account of is how to gauge the effect of the crisis. In this regard, we follow – in principle – Hempell and Kok Sørensen (2010), Blaes (2011) and Del Giovane et al. (2011), who employ a crisis dummy that takes the value of 1 from the third quarter of 2007 to the fourth quarter of 2009.¹¹ However, we define the crisis period from the third quarter of 2008 to the end of our sample because our analysis shows that the bankruptcy of Lehman Brothers and its consequences exerted more influence on Austrian banks than the earlier subprime crisis. The crisis dummy is included as an intercept dummy but in the robustness tests, we also interact it with the BLS variables. Furthermore, as the reporting of provisions on loans in the underlying Austrian statistics were changed in the second quarter of 2005, we additionally include a dummy variable corresponding to this quarter.¹²

¹¹ Hempell and Kok Sørensen (2010) additionally use the information provided by the special crisis-related ad hoc questions to examine the relative importance of the various factors behind supply restraints before and since the beginning of the crisis. However, for Austrian data these variables are strongly correlated with the balance sheet variable. Therefore, we did not use them in the present analysis.

¹² Starting with the reporting date of June 30, 2005, data on loans have been reported as nominal values.

The BLS supply and demand variables should reflect all determinants of loan growth. However, it is not clear, a priori, which of these variables should be included in the model and which lags should be taken into account. In principle, this problem could be circumvented by including all variables with the maximum number of lags in the regression. However, the estimation of such a model is not reasonable as the scarcity of data calls for a relatively parsimonious model. One approach to obtain a smaller model is to estimate a large number of models and compare them according to various criteria (e.g. goodness of fit) and then select a single model (stepwise model search). However, such an approach has some drawbacks: The decision which model to select may depend on the procedure applied and the sequence in which models are tested against each other. Additionally, a sequential application of simple significance tests means that the exact significance level cannot be computed (see e.g. Freedman, 1983). Furthermore, by focusing on a single model any inference about loan determinants and any assessment of the capability of the BLS to capture loan dynamics do not take into account model uncertainty. To cope with these problems, we apply Bayesian model averaging (BMA).¹³ BMA does not aim to select a single best model but takes all possible models

into account and assigns to them a probability that reflects how likely a model is given the data. Hence, BMA allows making inference unconditional on model specification. Eventually, we aim to obtain the posterior distribution (or some of its moments) of the parameters of interest. The posterior distribution combines information from the data and the prior that reflects prior (i.e. before knowledge of the relevant data) beliefs about the coefficient values. The relatively high variance of the chosen prior reflects our prior uncertainty about the coefficient values. Additionally to priors on the coefficients, it is also necessary to decide on model priors that reflect an initial belief about the likelihood of each model.¹⁴ For calculations, we use the R¹⁵ package BMS developed by Feldkircher and Zeugner (2009).

Below we will focus on the following outcomes of the BMA analysis: First, the posterior inclusion probability (PIP), which reflects the importance of a specific variable in explaining loan developments. The inclusion probability is calculated as the sum of the posterior model probability over all models that include this variable, where the posterior model probability reflects how likely each model is given the data.¹⁶ Second, we obtain the posterior mean for each variable. The posterior mean corresponds to a weighted aver-

¹³ For a recent overview on model averaging in economics, see e.g. Moral-Benito (2011).

¹⁴ For the results shown below we use the BRIC g-prior ($g = \max(N, K^2)$) and a beta-binomial model prior (Ley and Steel, 2009) with prior model size $K/2$, where K is the number of explanatory variables and N the number of observations. The number of burn-ins is 500,000 and the number of iterations two million. We applied other priors as well, but our main results prove to be unaffected by the prior used.

¹⁵ R is a language and environment for statistical computing and graphics (see R Development Core Team, 2011).

¹⁶ If we write the relationship to be estimated as $y = X\beta + \varepsilon$, where y denotes loan growth, X is the matrix of explanatory variables (including a constant and the lagged dependent variable) and ε a random shock, we can write the PIP of a specific variable (say X_i) as $PIP_{X_i} = \text{Prob}(\beta_i \neq 0 \mid y, X) = \sum_{j: \beta_i \neq 0} p(M_j \mid y, X)$ where $p(M_j \mid y, X)$ is the posterior model probability of model j . The latter is computed as $p(M_j \mid y, X) = (p(y \mid M_j, X) p(M_j)) / (p(y \mid X))$, where $p(y \mid M_j, X)$ is the marginal likelihood of model j , $p(M_j)$ the prior model probability and $p(y \mid X)$ denotes the integrated likelihood, which is constant over all models.

age of the means of the posterior densities of the parameters over all models (unconditional mean) or over only those models in which the variable is present (conditional mean).¹⁷ The weights used are the posterior model probabilities. Furthermore, as measure of dispersion we calculate the posterior standard deviation that does not only take into account parameter uncertainty conditional on a specific model but also the uncertainty of the parameter estimates across different models.

4.3 Results

Table 2 shows the cumulative posterior probability that at least one lag of the explanatory variables is included¹⁸ and the simple PIP for the crisis dummy. From the table we can infer that lagged loan growth plays an important role in determining current loan growth. Furthermore, demand contributes to the explanation of loan growth whereas the supply-related variables only play a minor role. The posterior inclusion probability for the crisis dummy is relatively low. This suggests that the crisis did not affect

loan growth over and above its impact via supply and demand.

Showing the results for the different lags included in the analysis, table 3 takes a closer look at the results for total loans. For the interpretation of the posterior inclusion probability, the classification suggested by Raftery (1995) may be useful: Raftery calls the evidence for a regressor weak if it has a PIP of between 50% and 75%, positive for a PIP between 75% and 95%, strong if the inclusion probability falls within the range of 95% to 99% and very strong for a PIP above 99%. Table 3 is in line with the observation derived from table 2 that demand variables are more important for loan developments (i.e. have a higher inclusion probability) than supply variables. Regarding lag length, our results show that the second lag is particularly important for loan developments, which suggests that it takes about two quarters for changes in demand to have an effect on loan developments. Additionally, table 3 shows the posterior mean and the posterior standard errors. The coefficients (and standard errors) are conditional on

Table 2

Cumulative Posterior Inclusion Probability

	Total loans		Short-term loans		Long-term loans	
	Specification 1	Specification 2	Specification 1	Specification 2	Specification 1	Specification 2
Loan growth	0.96	0.92	0.36	0.20	0.94	0.84
Standards	0.41		0.38		0.27	
Balance sheet		0.26		0.21		0.11
Risk		0.15		0.29		0.25
Demand	1.00	0.97	0.79	0.47	0.91	0.77
Crisis dummy	0.10	0.04	0.09	0.04	0.11	0.08

Source: Authors' calculations, OeNB.

Note: Probabilities above 0.5 in bold print.

¹⁷ The conditional mean (table 2) is computed as $E(\beta_i | y, X) = \sum_{j: \beta_j \neq 0} p(\beta_i | y, X, M_j) p(M_j | y, X)$.

¹⁸ Formally, the Cumulative Posterior Inclusion Probability of variable i corresponds to $Prob((\beta_{i,t-1} \neq 0) \vee (\beta_{i,t-2} \neq 0) \vee (\beta_{i,t-3} \neq 0) | y, X)$, where $t-s, s = 1, 2, 3$ denotes the time lag.

Table 3

Estimation Results for Total Loans – Austria

Variable	Lag	Specification 1			Specification 2		
		PIP	Posterior mean	Posterior standard deviation	PIP	Posterior mean	Posterior standard deviation
Loan growth	1	0.12	0.15	0.17	0.12	0.15	0.17
	2	0.93	0.42	0.12	0.93	0.42	0.12
	3	0.12	0.12	0.14	0.12	0.12	0.14
Standards	1	0.21	-0.21	0.14			
	2	0.25	0.21	0.12			
	3	0.10	0.07	0.14			
Balance sheet	1				0.06	-0.15	0.23
	2				0.20	0.27	0.14
	3				0.04	0.02	0.17
Risk	1				0.07	-0.21	0.23
	2				0.05	0.13	0.21
	3				0.08	0.22	0.20
Demand	1	0.65	0.29	0.11	0.41	0.29	0.12
	2	0.99	0.56	0.12	0.96	0.57	0.13
	3	0.12	0.13	0.14	0.05	0.11	0.16
Dummy 2005		0.77	-0.31	0.10	0.63	-0.32	0.11
Crisis dummy		0.10	0.07	0.13	0.04	0.03	0.14

Source: Authors' calculations, OeNB.

Note: Results for coefficients with a PIP of above 0.5 in bold print.

inclusion, i.e. they are calculated as a weighted average of the coefficient values of only those models in which the respective variable is included. This makes it possible to compare coefficients to estimates obtained from standard regressions. Furthermore, the coefficients are standardized, i.e. all variables are normalized such that their mean is zero and their standard deviation is one. In this way, it is easy to compare the effects of the different explanatory variables on loan growth as standardized coefficients indicate by how many standard deviations loan growth changes if an explanatory variable increases by one standard deviation.

The signs of the coefficients are by and large as expected, i.e. higher demand or loosened credit standards lead to stronger loan growth. An increase in demand by one standard deviation (corresponding to a rise of the diffusion in-

dex by 0.12 points) leads to a maximum increase in loan growth by 0.56 standard deviations (corresponding to approximately 0.7 percentage points). The maximum impact occurs two quarters after the change in demand. According to our results, balance sheet or risk considerations do not help explain loan growth. In this sense, the empirical results of this paper do not give any indication for a credit crunch.

The results presented above are corroborated when looking at the five best models, i.e. the five models with the highest posterior model probability (table 4). Loan growth and demand (both with a lag of two periods) are included in all of the five best models. Demand with a lag of one period and the 2005 dummy are included in the best model and two further models out of the best five models. Table 4 also gives us some insight into model uncertainty. For total loans, the posterior

Table 4

Best Models

Specification 1						Specification 2							
Variable	Lag	1	2	3	4	5	Variable	Lag	1	2	3	4	5
Loan growth	1						Loan growth	1					
	2	x	x		x	x		2	x	x	x	x	x
	3			x				3					
Standards	1						Balance sheet	1					
	2					x		2					x
	3							3					
Demand	1	x		x		x	Risk	1					
	2	x	x	x	x	x		2					
	3							3					
Dummy 2005 Crisis dummy		x	x			x	Demand	1		x		x	
								2	x	x	x	x	x
								3					
Posterior model probability		0.17	0.13	0.06	0.06	0.03	Dummy 2005 Crisis dummy		x	x			x
									0.16	0.12	0.12	0.08	0.07

Source: Authors' calculations, OeNB.

Note: The table shows the explanatory variables included in the five best models as well as the posterior model probability both for specification 1 and specification 2. x indicates that the variable is considered in the model; for variables that are not considered, the cell is left blank.

model probability of the best model amounts to 17% (16% in specification 2). The posterior model probabilities of the five best models together amount to 45% (55%) but are very low from the third (fourth) model on. For specification 1 we can also enumerate and estimate all potential models by ordinary least squares and compare the models by different tests with the aim of extracting a “best model.” For total loans by Austrian banks, the model selected using this approach is the same as the best model under the Bayesian approach.

To gain some insight into the explanatory power of the present estimation results, we estimate the best model (i.e. the model with the highest posterior model probability) and the median model (i.e. the model including all variables with a PIP above 0.5) by OLS and calculate the corresponding adjusted

R^2 .¹⁹ For total loans, the adjusted R^2 amounts to 0.68 for specification 1 and to 0.61 for specification 2. Including further variables (e.g. gross fixed investment, GDP, interest rates) or a term that interacts the BLS variables with the crisis dummy does not change our main results. With regard to short-term loans, the BLS variables do not allow us to model loan growth in a meaningful way. This may be due to the high volatility of short-term loans. Short-term loans are repaid within one year. Hence, the difference between the issuance of new loans, to which the BLS questions refer, and the net transactions recorded in the BSI statistics is particularly pronounced. For long-term loans, the adjusted R^2 amounts to 0.57 and the results suggest that loan developments are mainly driven by demand.

¹⁹ The quality of BMA results is often judged by their forecasting accuracy. However, with regard to the present data, a forecasting exercise does not make much sense given the small number of observations.

4.4 Putting the Austrian Results into Perspective

The prominent role of demand in explaining Austrian loan developments distinguishes the present results from comparable studies covering other regions. Those studies mostly find that both in the euro area (De Bondt et al., 2010; Hempell and Kok Sørensen, 2010) and in the United States (Lown et al., 2000; Cunningham, 2006; Bayoumi and Melander, 2008) credit standards influence loan developments more strongly than demand. Papers on individual euro area countries come to the same conclusion (e.g. Blaes (2011) for Germany and Lacroix and Montornès (2009) for France).

To put the Austrian results into context, we re-ran the estimation for total loans for Germany and the euro area.²⁰ This makes it possible to compare our results with those of studies covering these regions. Additionally, a comparison with Germany could be informative because of the considerable structural similarities of the Austrian and German financial sectors (both are bank-based financial systems with a large number of banks and relationship banking playing a strong role). In Austria and Germany, loan volume growth was quite similar and consistently below the euro area average before the crisis. Additionally, macroeconomic developments in Austria and Germany were relatively comparable both before and after the onset of the crisis.

Table 5 presents the cumulative PIP for total loans in Germany and the euro area. It shows that both in Germany and in the euro area supply-side factors play a more important role in

explaining the growth of total loans than demand factors. This result is in line with the results obtained by the studies mentioned above that employ a different methodology (which implies that the different result for Austria is not attributable to methodological reasons). Furthermore, the results obtained from specification 2 suggest that in Germany, supply-side factors affected loan growth mainly through risk considerations whereas in the euro area, balance sheet-related reasons had more influence. Additionally, the PIP of the crisis dummy is relatively high for the euro area in specification 1²¹. Hence, the crisis had a stronger impact on loan growth than what can be explained by changes in credit standards or loan demand. These results suggest that a credit crunch as defined by Bernanke and Lown (1991) may have taken place in the euro area. With regard to total loans, our results further suggest that demand factors affect loan growth in the euro area while they seem to play no role in explaining loan volume growth in Germany. This

Table 5

Cumulative Posterior Inclusion Probability Total Loans – Germany and the Euro Area

	Specification 1		Specification 2	
	Germany	Euro area	Germany	Euro area
Loan growth	1.00	1.00	1.00	0.99
Standards	0.89	0.60		
Balance sheet			0.27	0.72
Risk			0.52	0.30
Demand	0.14	0.63	0.07	0.33
Crisis dummy	0.07	0.64	0.04	0.15

Source: Authors' calculations, Deutsche Bundesbank, ECB.

Note: Probabilities above 0.5 in bold print.

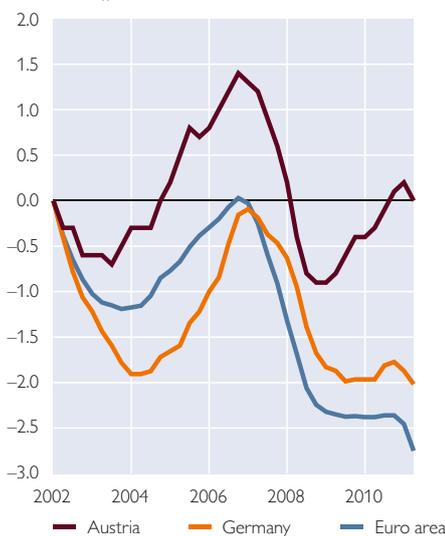
²⁰ BLS data for the euro area were obtained from the ECB website and for Germany from the website of the Deutsche Bundesbank.

²¹ In specification 2, the balance sheet and risk variables are likely to absorb some of the crisis effects and thereby to reduce the inclusion probability of the crisis dummy.

Terms and Conditions – Price Elements

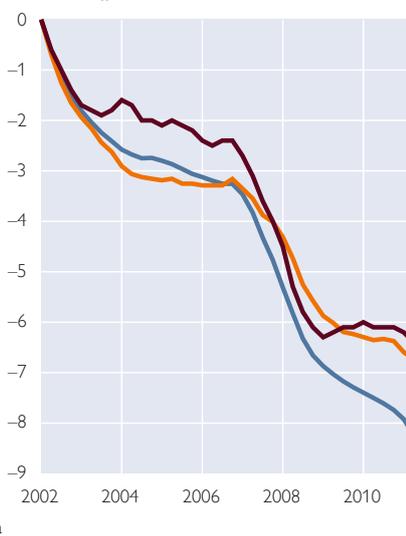
Margin on Average Loans

Cumulated diffusion index



Margin on Riskier Loans

Cumulated diffusion index



Non-Interest Rate Charges

Cumulated diffusion index



Source: OeNB, Deutsche Bundesbank, ECB.

result is also remarkable because even though credit standards were tightened to a much greater extent in Austria than in Germany, the quarterly growth rate of loans to nonfinancial corporations was higher in Austria than in Germany in 17 out of 37 quarters of the sample period.

There may be two possible explanations for these differences between Austria and Germany. The first relates to the different development of the BLS demand variable. On average, loan demand increased in Germany whereas it dropped in Austria. It is possible that the impact of credit standards is muted in a low demand environment. This effect was probably most pronounced during the crisis. Even though in both countries standards were tightened and loan growth slowed down during the crisis, according to the BLS loan demand decreased considerably in Austria whereas it rose in Germany.

The second potential explanation for the different effects of credit stan-

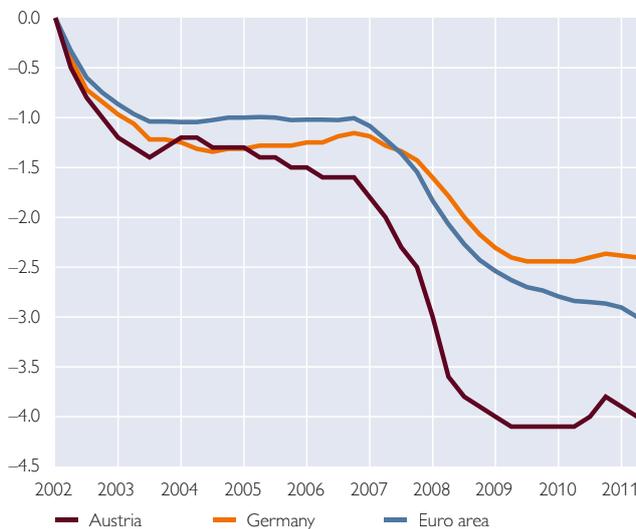
dards on loan growth relates to terms and conditions. As pointed out above, credit standards not only affect loan volumes but can also influence the terms and conditions of a loan – which are either the price (interest rate and non-interest rate charges, i.e. fees) or all the other specific obligations agreed upon by the lender and the borrower that are part of a loan contract. The BLS requests information on various elements of such loan stipulations. A simple graphical analysis might provide some preliminary insight into the relationship between credit standards and price and non-price terms. To make it easier to capture developments over time in the charts, we depict the cumulated diffusion index values of the changes of the various terms and conditions according to the BLS instead of the original values.

Looking at the price elements of loans (chart 2), we see that banks in Austria and Germany have tightened the margins on riskier loans much more

Terms and Conditions – Collateral and Covenants

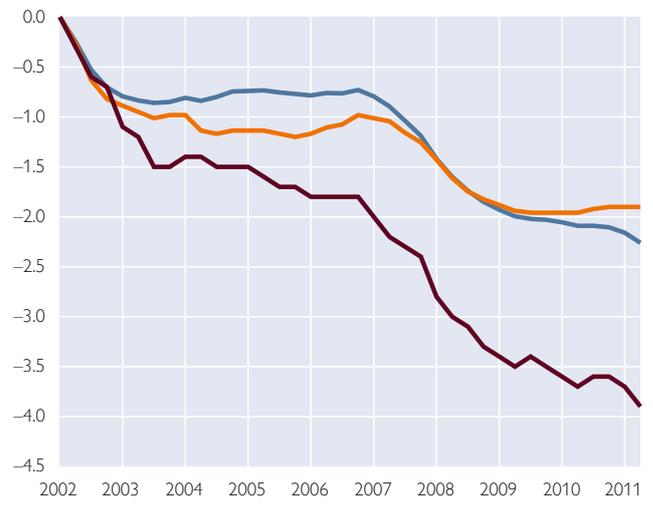
Collateral Requirements

Cumulated diffusion index



Loan Covenants

Cumulated diffusion index



Source: OeNB, Deutsche Bundesbank, ECB.

strongly than those on average loans whereas in the euro area as a whole, margins on average loans were tightened more strongly. Concerning non-interest rate charges, there were no significant differences. So overall, in price terms, BLS results for Austria and Germany do not indicate many differences.

Regarding the non-price aspects (chart 3), it is striking that Austrian banks tightened loan covenants and collateral requirements to a considerably higher degree than did banks in Germany and the euro area as a whole. This did not happen only during the crisis but already in the years before the crisis, when Austrian banks tightened these two price elements to a much higher degree than German or euro area banks. So it might have been the case that in Austria part of the tightening of credit standards may have been effected by stricter loan covenants and higher collateral requirements rather than by curbing volumes. While tighter credit standards in

Germany much more often meant the denial of a loan and led to lower growth rates.

5 Conclusions

This paper aims to assess whether BLS data help explain changes in loan volumes in Austria – as derived from the BSI statistics – and seeks to provide some evidence on whether loan developments can be attributed to demand or to supply factors. We find that at least the development of total loans to enterprises can be reasonably associated with supply and demand information from the BLS. The explanatory power of the BLS is highlighted by the fact that the inclusion of additional variables from other sources neither considerably contributes to the explanation of total loan growth nor changes our main results substantially. According to the present results, loan volumes change mainly because of changes in the demand variable, whereas – in contrast to the findings for Germany

and the euro area as a whole – supply-side effects play only a secondary role.

Another finding is that in view of the low inclusion probability of the crisis variable, the crisis did not impair the volumes of bank lending to enterprises above its impact on credit standards (both on balance sheet factors and risk perception) and loan demand (via reduced investment spending, lower mergers and acquisitions activity, etc.). That is to say, the crisis did not affect the usual lending relationship between enterprises and banks. In other words, the slowdown (and for some time, even reduction) in lending volumes observed after the onset of the crisis was more or less in line with macroeconomic fundamentals. This is confirmed by the fact that banks did not tighten credit standards more often, and only somewhat more pronouncedly, during the crisis than before, and also the tightening of covenants and collateral requirements was not a pure crisis phenomenon.

Although loan growth cannot be attributed to either pure credit supply effects or banks' risk considerations, the relatively minor role of both the crisis dummy and the supply variables indicates that in Austria, there was no credit crunch as defined by Bernanke and Lown (1991) during the observation period. Regarding the broader definition of credit crunch provided by Owens and Schreft (1993), according to which a credit crunch occurs when non-price loan conditions significantly increase, the evidence is less clear. Chart 3 shows that tighter credit standards manifested themselves in stricter loan covenants and collateral requirements. However, given the purely qualitative nature of the BLS survey it is difficult to tell whether these increases were "significant" enough to qualify as a credit crunch. Even less can be said about the reasons for tightening cove-

nants and collateral requirements in the first place, as the BLS does not require respondents to state the reasons behind such changes. However, given the strong correlation between credit standards and terms and conditions for loans, it would stand to reason that the same factors were at play in both cases. Moreover, this tightening of terms and conditions did not only take place during the crisis, but was observed during the entire observation period.

Given the conceptual issues discussed in this paper, a number of caveats must be taken into account when interpreting the results. A major point in this context is that the BLS questions refer to newly extended loans (including credit lines) whereas BSI statistics record changes in loan volumes. As soon as the new statistics on gross loan volumes provide a time series long enough for empirical analysis, it will be worthwhile to repeat the investigation with this new series. In interpreting the present results, one should also bear in mind that they are based on a relatively short time period, which calls for a parsimonious model and hence a limited number of explanatory variables. Even though the inclusion of further variables did not affect our main results, it may still be useful to undertake a more comprehensive analysis as soon as the available time series is long enough.

A further issue that country-specific studies have to take into account is the euro area-wide scope of the BLS. This means that the available data refer to loans granted across the euro area as a whole, and therefore the potential to make country-specific statements is somewhat limited. To gain some insight into these potential limitations, we re-estimated specification 1 using data on total loans by Austrian banks to Austrian corporations as the dependent

variable. While using this new loan variable reduced the explanatory power of the model, it did not affect our main conclusions (e.g. the relevance of the demand variable). Furthermore, the reduced explanatory power gives some indication that banks indeed have their euro area operations in mind when answering the BLS questionnaire. A po-

tential extension to the present paper is to directly use the BLS information on both terms and conditions and on prices for loans. Additionally, the responding loan officers' expectations on future developments of credit standards and loan demand could be assessed for their usefulness in forecasting loan growth.

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Savings Deposits in Austria – A Safety Net in Times of Crisis

Households, financial intermediaries and ultimately even businesses all rely on savings deposits. On the one hand, savings deposits constitute a central pillar of precautionary saving; they play an important role in individual saving for old age and provide a financial buffer against unexpected events. On the other hand, they provide the bedrock of funding for the banking system and thus help maintain the flow of credit from banks to businesses.

This paper draws on a unique data set compiled by the Oesterreichische Nationalbank (OeNB), which covers all savings accounts that domestic nonbanks held with banks reporting to the OeNB in the review period. We are thus able to analyze the changes in the total volume of deposits and their distribution across different categories of size in the period from 2002 to 2011. Against this backdrop we highlight how the relative significance of smaller and larger accounts changed before and during the financial crisis, and we discuss what role the deposit insurance system as well as savings plans with building and loan associations played in this context. On balance, we find the share of savings deposits in households' total financial wealth to have remained broadly stable; the allocation of funds to the individual categories was subject to visible changes, however.

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JEL classification: G00, G11, G21, G28, H31, H81

Keywords: deposits, safe assets, deposit insurance, Austria, financial stability

The Austrian household sector has gained significantly in financial wealth since 1980. In the last decade alone, its financial wealth increased from EUR 311 billion (2001) to EUR 509 billion (2011) or, measured as a percentage of the sector's disposable income, from 244% (2001) to close to 293% (2011).

The aim of this paper is to highlight how savings deposits, which are a major component of households' financial wealth, developed during the period from 2002 to 2011. The data are sorted into eight different categories of size, which range from deposits below EUR 10,000 to deposits above EUR 3 million. Closer analysis provides detailed insights into the fluctuation of savings balances in general and into the extent of portfolio shifts among the different account categories before and after the crisis.

Savings deposits and their relative importance within the aggregate of financial assets are a key issue for eco-

nomics analysis (Gorton et al., 2012). After all, it is a central role of banking systems to channel the money saved by those who do not require it for consumption or investment to those who need to raise capital to finance their investments. In the household sector, financial assets have traditionally exceeded financial liabilities, whereas the corporate sector has typically been a net debtor because of its investment requirements. Savings deposits thus help maintain a steady flow of funds to the economy and enable the corporate sector to keep investing for the future. In this respect, the banking system fulfills the important task of deciding which businesses should get to borrow the savings, based on an assessment of their ability to repay the borrowed funds plus interest, and of setting adequate interest rates.

This is an information-intensive process in which Austrian banks benefit from the prevalence of relationship

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banking. After all, banks that have developed long-term working relationships with their customers and thus have come to know them are in a position to assess exposure risks themselves rather than having to rely on the expertise of rating agencies. Sharp decreases in savings deposits and bank runs could have fatal consequences for individual banks and, eventually, for the banking system as a whole as they create liquidity constraints for banks. Ultimately, the flow of credit to enterprises might dry up completely.

The financial crisis has generally heightened uncertainty. As a result, households should have stepped up precautionary saving, demand for safe forms of investment should have increased, and the deposit insurance reform should have had an impact on investment patterns. The conventional view is that it is above all low-income individuals who put their savings into savings passbooks.² Actually, this was also one of the arguments put forth by the Austrian authorities in their negotiations with the Financial Action Task Force (FATF) of the OECD about the abolition of the anonymity of savings passbooks, which ultimately came in 2000. More than a decade on, savings passbooks continue to be the savings form of choice of Austrian households. Yet whether savings passbooks have in fact been monopolized by low-income savers shall be analyzed empirically in the following.

This paper is structured as follows. Section 1 discusses the underlying data. Section 2 highlights general changes in financial investment in recent years and decades, whereas section 3 details how savings balances and their composition changed in the period from 2002 to

2011. Section 4 focuses on portfolio shifts between smaller and larger savings account categories, with a particular emphasis on the underlying role of savings plans with building and loan associations and the deposit insurance system. Section 5 concludes.

1 Data on Savings Deposits

Data on households' savings can be gleaned from a number of sources. Data sources include the national accounts and banking data collected for supervisory purposes as well as the Survey on the Financial Wealth of Households that the OeNB conducted in 2004 as a pilot project for the euro area-wide Household Finance and Consumption Survey (HFCS – www.hfcs.at).

1.1 National Accounts Data on Deposits

Changes in financial wealth are tracked extensively by the financial accounts, which are an integral part of the national accounts. Aggregate amounts of all measures covered are available for all three sectors of the economy, i.e. for the public sector, the corporate sector and the household sector. Collecting the data for the national accounts is a time-intensive process that is prone to errors and fraught with imprecision and measurement problems (for a paper focusing on property income, see Waschiczek, 2009). This notwithstanding, the national accounts constitute the most comprehensive source of sectoral aggregates.

This paper focuses on households' savings deposits. In the European System of National Accounts (ESA 95), which is the binding framework for compiling the national accounts for Austria, savings deposits are classified in the *currency*

² www.sparkasse.at/sgruppe/Sparkassenverband/die-geschichte-des-sparens-in-oesterreich (as retrieved on June 13, 2012).

and deposits segment of the household sector's financial wealth (ESA code AF.2).

Financial wealth as defined by ESA includes:

- Currency and deposits: sight deposits, savings deposits, savings plans with building and loan associations;
- Debt securities: money market instruments, bonds;
- Shares and other equity: shares, mutual fund shares, shares in limited liability companies;
- Insurance technical reserves: net equity in pension insurance;
- Other accounts receivable: trade credits.³

The assets classified in these categories add up to the financial wealth of the household sector, which consists of two subsectors under ESA: *households* (sector 14) and *nonprofit institutions serving households* (NPISHs) (sector 15). While the *households* subsector subsumes the financial assets of all households and self-employed persons, including single

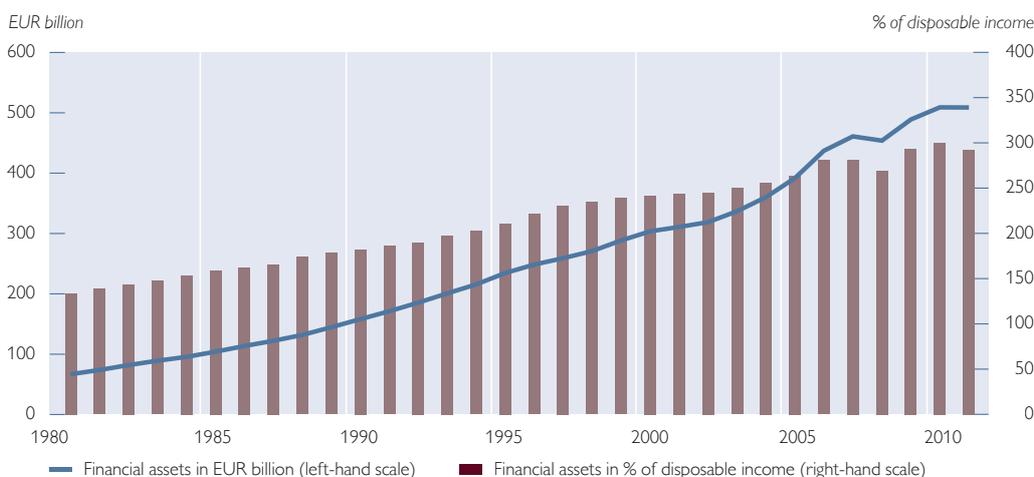
proprietorships and professionals, the NPISH subsector includes churches, nonprofit organizations and private foundations.

Since the 2006 reporting year, data on these two subsectors have been collected separately and can therefore be analyzed individually. This is of crucial importance because of the high relevance of private foundations in Austria and because the asset volumes and investment patterns of NPISHs and households differ strongly (Andreasch et al., 2009). The fact remains that the definition of households on which the financial accounts is based is not entirely consistent, as it also includes self-employed persons and thus more than households in the narrow sense of the word. The level of average household wealth as reflected in the financial accounts is therefore somewhat misleading.

Chart 1 shows how the financial wealth of the household sector has evolved on balance over time. Chart 2

Chart 1

Financial Wealth of the Austrian Household Sector

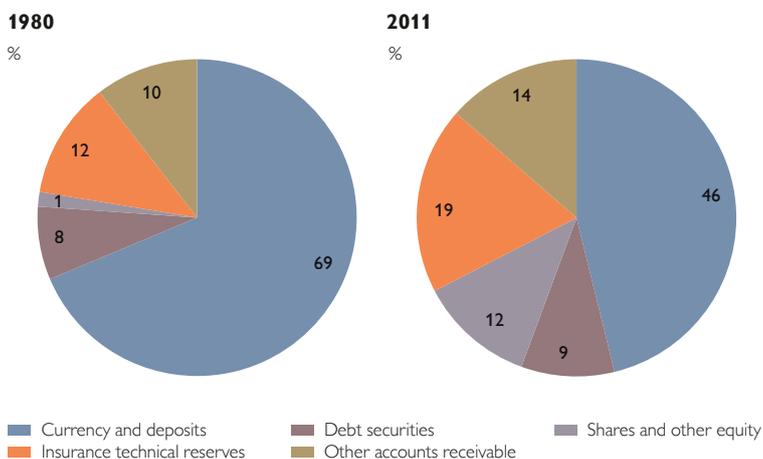


Source: OeNB.

³ For a complete list of all components of financial wealth as defined under ESA see the special issue of the OeNB's Statistiken series entitled "Sector Accounts in Austria 2010."

Chart 2

Components of Financial Wealth of the Austrian Household Sector



Source: OeNB.

illustrates the underlying portfolio shifts between the components of household financial wealth as defined above.

1.2 Banking Data on Savings Accounts

The portfolio of deposits made by domestic nonbanks consists of sight, term and savings deposits. The OeNB collects statistical data on those deposits in intervals of six months. The purpose of this exercise is to monitor the volume of savings deposits that are covered by the deposit insurance system.

The data are collected through the reporting system established for commercial banks, which covers all accounts held by all domestic nonbanks. More than 95% of all deposits on savings accounts stem from *households* (S14). Neither the public sector nor the corporate sector have major balances in savings accounts.

All banks reporting to the OeNB have to indicate the number of accounts customers hold with them in eight different categories and the respective aggregate balances.

The account categories are defined as follows:

- balances of up to EUR 10,000;
- balances between EUR 10,000 and EUR 20,000;
- balances between EUR 20,000 and EUR 50,000;
- balances between EUR 50,000 and EUR 100,000;
- balances between EUR 100,000 and EUR 500,000;
- balances between EUR 500,000 and EUR 1 million;
- balances between EUR 1 million and EUR 3 million;
- balances above EUR 3 million.

All in all, domestic nonbanks hold some 23 million savings accounts. Given a population of about 8.4 million and some 3.7 million households, we arrive at an average number of 2.7 accounts per person, which would appear to be rather high. Yet in these statistics every single savings passbook, savings account and savings plan features as a separate account. Furthermore, the actual number of accounts per person may deviate considerably from 2.7, as high-income customers will hold numerous accounts and deposit their assets with more than one bank.

1.3 OeNB Survey on Household Financial Wealth (2004)

The financial wealth survey conducted by the OeNB in 2004 is the only source of micro data available on the allocation of Austrian households' savings deposits. The survey was based on a random sample of households and yielded responses from a total of 2,556 households. In total, 87 questions were asked with a view to identifying, among other things, the sociodemographic characteristics and financial attitude of the respondents, what kind of assets they held and how they had acquired them, and what sources of financial informa-

tion they generally consulted. As is typical of household surveys, this survey was biased toward the middle class, as it is rather difficult to reach poorer households and even more so the very wealthy ones in such surveys (Moos-lechner and Schürz, 2009).

The survey confirmed much higher household participation rates for savings deposits than for shares, mutual fund shares or business equity interests. Moreover, savings balances were found to be more evenly distributed across the deposit categories among the holders of savings deposits than among other investors (Fessler and Schürz, 2008; Andreasch et al., 2009).

2 Savings Deposits as a Component of Financial Wealth

This section draws on the national accounts data discussed in section 1.1. Savings deposits are classified in the *currency and deposits* segment of financial assets.

The sharp rise of financial assets since 1980 (chart 1) is evident from the aggregate balances as well as when

measured as a ratio of disposable income. At the same time, the currency and deposits segment has become smaller (chart 2), above all because cash is no longer as important as it used to be. In turn, shares and other equity have become more important within the financial assets portfolio, as can be observed particularly for the 1990s, among other things because of the impact of price effects.

To better understand the portfolio shifts that occurred among financial assets it is helpful to compare financial investment patterns with saving patterns. While there is no directly proportional relationship between the two measures, the accumulation of savings does have a major impact on the evolution of financial investment in Austria, as the latter tends to go hand in hand with saving rather than borrowing. The only exception are foreign currency loans, where borrowers make regular payments toward a repayment vehicle to save for the day when they need to pay back the loan in a single payment. This synchronous movement of finan-

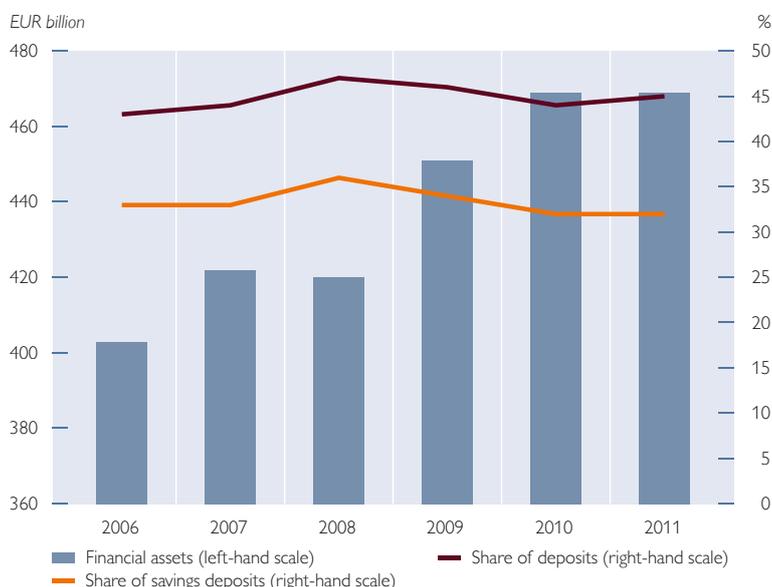
Chart 3

Financial Investment and Saving Ratio of the Austrian Household Sector



Chart 4

Financial Wealth of Austrian Households



Source: OeNB.

cial investment and the saving ratio is evident from chart 3. Since the onset of the crisis, shares and other equity have suffered valuation losses and the saving ratio has decreased, both of which have caused financial investment to decelerate.

Chart 4 shows the share of savings deposits in the financial wealth of

Austrian households from 2006 to 2011. Even though households' financial wealth increased sharply in that period, the share of their savings deposits remained broadly stable. The underlying data imply neither portfolio shifts from low-yield savings deposits to riskier forms of investment before the crisis nor a flight for safety during the crisis.

3 Allocation of Savings Deposits

3.1 Savings Account Details for the Period from 2002 to 2011

Table 1 shows how many savings accounts existed in Austria in 2011, broken down by the eight account categories discussed here, as well as how the aggregate balances (totaling around EUR 157 billion) were distributed across those categories. The distribution is heavily skewed toward the higher categories: more than 80% of savings account balances are below EUR 10,000, more than 95% are below EUR 20,000, and more than 98% are below EUR 50,000. This lopsided distribution also reflects the averaging-down impact of accounts with very small balances.

On the other side of the spectrum, the share of savings deposits above EUR 100,000 is below 0.6%, and the share

Table 1

Savings Account Data for 2011

Account category	Number of accounts		Share in total number of accounts		Aggregate balances		Share in aggregate balances		Balance per account
			%	cumulated in %	EUR million	%	cumulated in %	EUR	
Up to EUR 10,000	18,760,739		80.939	80.939	40,820	26.003	26.003	2,176	
EUR 10,000 to EUR 20,000	3,200,669		13.809	94.747	43,350	27.615	53.618	13,544	
EUR 20,000 to EUR 50,000	807,007		3.482	98.229	25,056	15.961	69.579	31,049	
EUR 50,000 to EUR 100,000	281,698		1.215	99.444	19,147	12.197	81.777	67,971	
EUR 100,000 to EUR 500,000	121,761		0.525	99.970	20,221	12.881	94.658	166,070	
EUR 500,000 to EUR 1 million	4,833		0.021	99.990	3,190	2.032	96.690	660,115	
EUR 1 million to EUR 3 million	1,856		0.008	99.998	2,805	1.787	98.477	1,511,120	
Above EUR 3 million	366		0.002	100.000	2,391	1.523	100.000	6,533,617	
Total	23,178,929				156,981			6,773	

Source: Savings account data compiled by the OeNB.

of those above EUR 500,000 is a mere 0.3% or about there.

Chart 5 shows the percentage shares that the individual account categories held in the number of accounts and in aggregate savings in the period from 2002 to 2011. The share of deposits with small balances is shown to be very high, and that of deposits with large balances is shown to be very small. This pattern has remained broadly stable over the review period. Only the share of accounts with balances below EUR 10,000 has dropped slightly. This decrease may have been influenced by the fact that the account categories are based on nominal amounts and have not been adjusted since 2002, which may have caused a number of savings accounts originally classified in the category below EUR 10,000 to move up one notch as interest accrued.

The share of savings deposits in the account categories above EUR 20,000

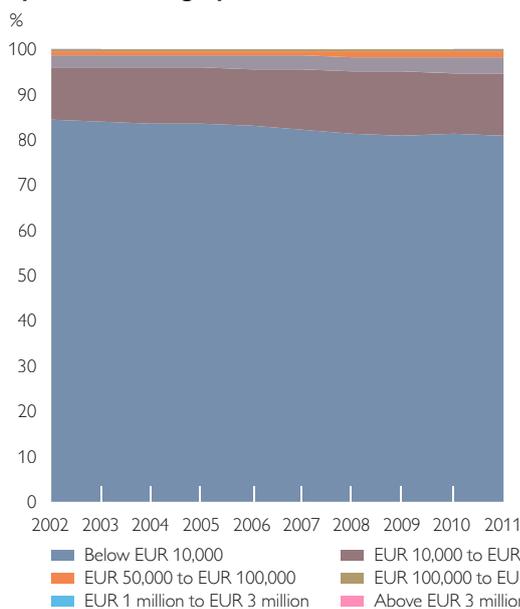
(some 5% of all accounts) in the aggregate balances has increased, while it has decreased in the two account segments below EUR 20,000 (some 95% of all accounts). In the case of the lowest account class, the decrease was disproportionately large (5 percentage points). In terms of its share in aggregate balances, the segment with account balances between EUR 10,000 and EUR 20,000 likewise shrank, even though the number of accounts in this segment continued to increase.

The larger the size of the account category, the larger the amount by which its share of the aggregate balances rose. For instance, the share of accounts with balances between EUR 20,000 and EUR 50,000 rose just 1%, while that of the EUR 100,000 to EUR 500,000 category jumped by about 18%. The share of savings deposits classified in the highest account class (above EUR 3 million) in total savings deposits

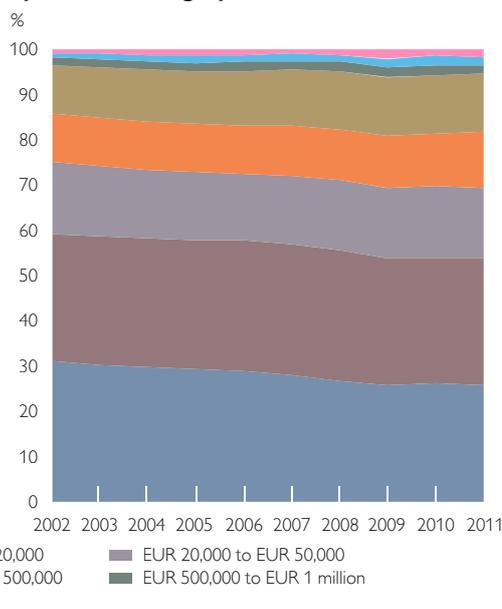
Chart 5

Savings Deposits by Account Category (2002–2011)

Share in Total Number of Accounts by Account Category



Share of Aggregate Balances by Account Category



Source: OeNB.

more than doubled in the period from 2002 to 2011, which was particularly striking.

3.2 Banking Data versus 2004 Financial Wealth Survey Data

The financial wealth survey of 2004 also identified the amounts of all savings deposits held by individual households. These data can be aggregated for further analysis, but they cannot be broken down into more detailed information on savings passbooks, savings accounts or savings plans held by the individual household members, because the survey focus had been on collecting data per household.

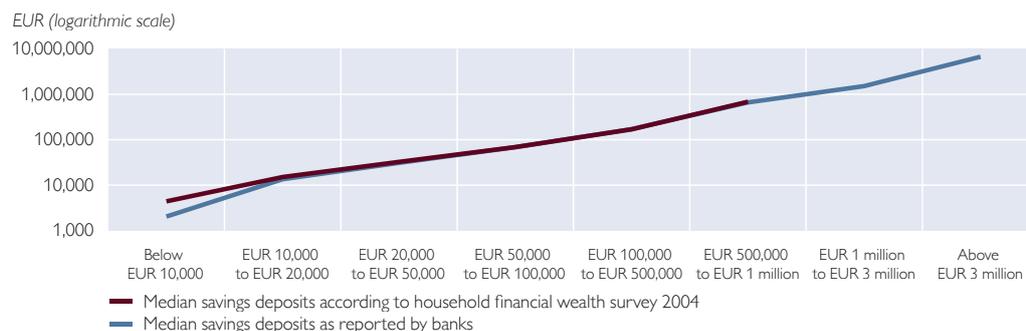
Chart 6 compares the medians of savings deposits as indicated by households with the medians of savings deposits reported by banks, for all eight account categories used here. The comparison illustrates that the financial wealth survey did not track savings deposits beyond EUR 1 million. The upper limit for a single account in the financial wealth survey is the sum of all savings accounts of all members of a given household, as individual households hold six accounts on average and as individual accounts would not normally be allocated to several households.

Chart 7 illustrates the difference between account-level data and household-level data for 2004. On the one hand we calculated the percentage share of the number of accounts and of the number of households with savings in the individual account categories, and on the other hand we calculated the percentage share of the individual categories in the aggregate balances.

We found most households to have savings portfolios in the middle range of the account categories but the largest numbers of accounts to fall into the categories with the smallest balances. This difference can be explained with the fact that households generally hold more than one account. In the middle of the scale, the differences are negligible. The share of households cannot be indicated for the two account categories above EUR 1 million because no observations are available for that range, as the financial wealth survey did not identify savings deposits with really high balances. In 2004, there were 1,521 accounts (or 0.06% of accounts) exceeding EUR 1 million among the approximately 23.7 million savings accounts. The deposits on these 1,521 accounts added up to EUR 3.6 billion,

Chart 6

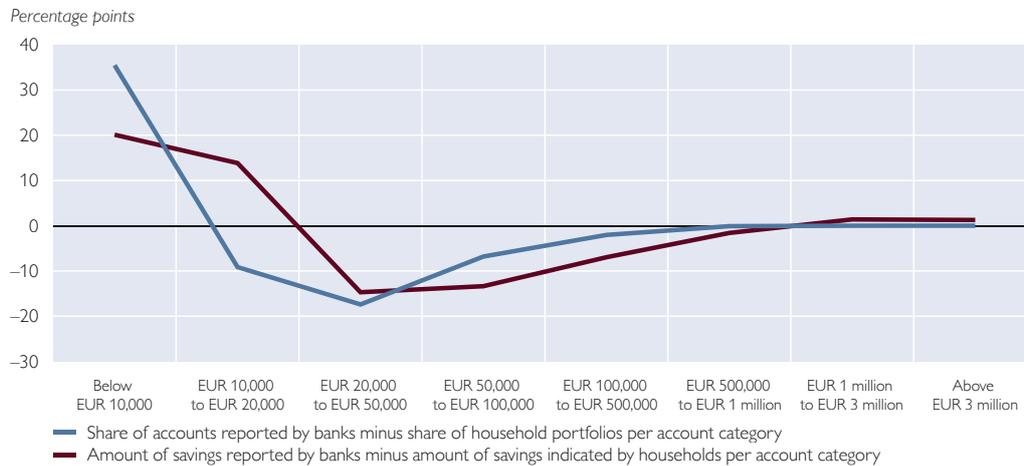
Difference in the Amount of Deposits Reported by Banks and Households per Account Category (2004)



Source: OeNB.

Chart 7

Difference in the Number of Accounts and Amount of Deposits Reported by Banks and Households per Account Category (2004)



Source: OeNB.

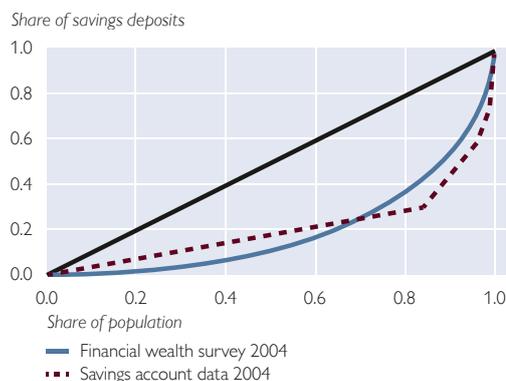
which corresponds to 2.6% of the aggregate savings balances.

Chart 8 shows how savings deposits are distributed across savings accounts, as reported by banks for 2004, and among households, as established in the financial wealth survey 2004. The respective Lorenz curves indicate that savings deposits are less heavily concentrated among households than across savings accounts. These findings are attributable to the different units of observation and to the divergent coverage ratios of the two data sources. The wealth portfolios of the wealthy are typically understated in surveys. The data available for this study exhibit the deficiencies which voluntary household surveys are known to display (Schürz, 2012). If the OeNB's financial wealth survey had covered also households with accounts at the upper tail of the distribution (chart 6), the corresponding Lorenz curve would have been steeper, and the Gini coefficient measuring the degree of inequality would have been higher. Moreover, the Lorenz curve based on the savings

account data does not entirely reflect the inequality of the distribution within the account categories. The underlying data require us to assume that all data are distributed equally within the individual segments, i.e. we have allocated all accounts within a given class to the respective mean. This implies that the inequality of the distribution will have been understated and explains why the Lorenz curves overlap at the lower end.

Chart 8

Lorenz Curve of Savings Deposits



Source: OeNB (savings account data 2004 and household financial wealth survey 2004).

4 Savings Deposit Patterns during the Crisis

A key indicator of the current crisis is the rise in uncertainty (Mody et al., 2012). Higher uncertainty ought to have increased the savings incentives for households, i.e. the incentive to hedge against further adverse shocks through precautionary saving.

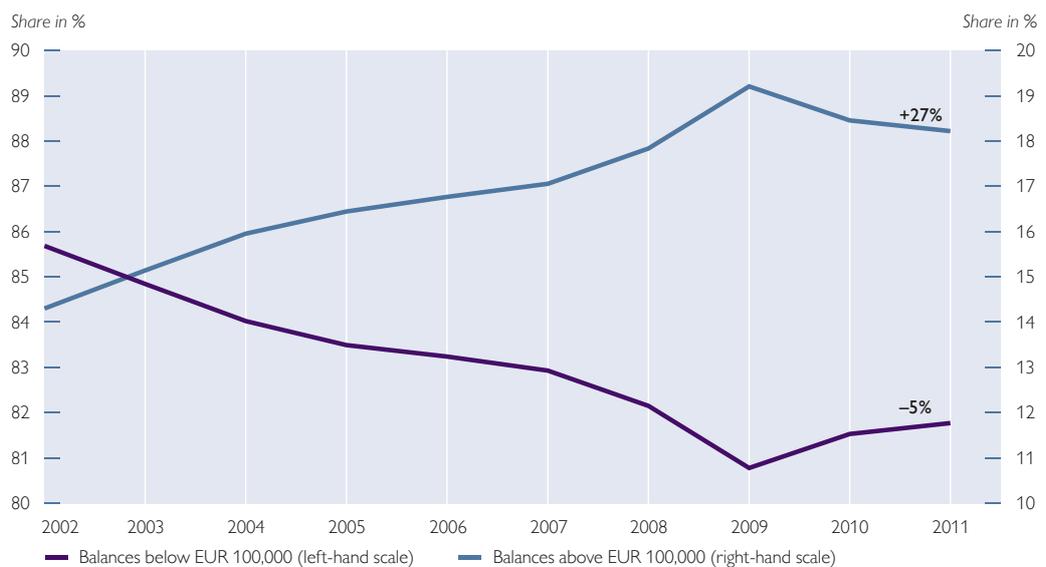
Savings deposits in the category above EUR 100,000 are found to have risen significantly in the past ten years.

The upper-tier accounts are only a small fraction (2011: some 0.6%) of all accounts.

According to the financial wealth survey 2004, 96.7% of all households held at least one savings passbook and 70.6% held at least one savings plan with a building and loan association; 53.1% had concluded at least one life insurance plan; at the same time only 15.7% owned stocks and only 10.6% had purchased bonds (Mooslechner and

Chart 9

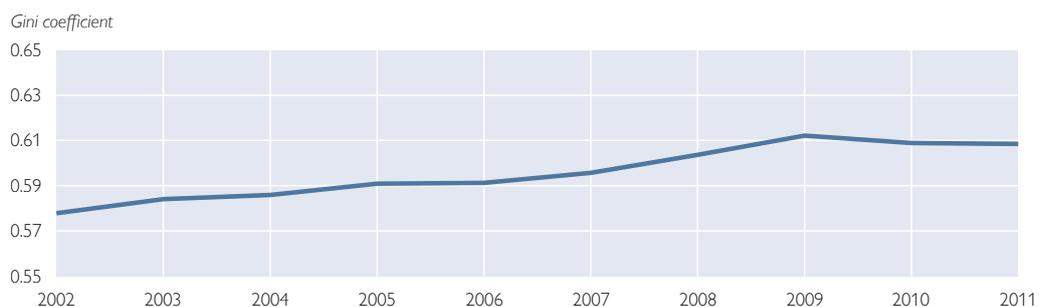
Share of Savings Deposits in Higher and Lower Account Categories in Aggregate Balances



Source: OeNB.

Chart 10

Gini Coefficient for Savings Deposit Accounts (2002–2011)



Source: OeNB.

Schürz, 2009). Hence, savings deposits are widespread and generally distributed more evenly than more risky assets such as stocks and mutual fund shares (Fessler and Schürz, 2008).

Based on 2011 data, the Gini coefficient was 0.61 for savings accounts, which is rather high. Yet this high value must be interpreted with caution: After all the underlying data do not refer to individual or household data but to information on savings accounts. Most people in Austria can be expected to hold more than one account, but we do not know in which category the individual accounts fall. This goes to show the importance of household surveys which cover the entire wealth portfolio of households and provide for a detailed breakdown of households' assets. Finally, the data at hand provide only averages for the individual wealth categories; hence it is not possible to analyze the distribution of savings deposits in detail (see more detailed explanations in section 3.2). Despite these caveats, the high Gini coefficient invariably indicates that the distribution of savings deposits across savings accounts shows a high degree of inequality. What also matters are the changes to be observed in the Gini coefficient over time. Based on the available data we find the Gini coefficient to have been on a continual ascent from 2002 until 2009. Thereafter, the indicator of inequality remained strikingly stable, even during the crisis.

4.1 Deposit Insurance

The Austrian deposit insurance system is a statutory measure designed to safeguard customer deposits with credit

institutions in case banks file for bankruptcy or are put under forced administration, etc. Each sector of the Austrian banking system runs its own deposit insurance scheme. Membership in the respective scheme is a precondition for receiving a license to take in deposits or provide securities services.⁴ Deposit insurance is compulsory for credit balances in accounts or deposits in savings passbooks, other current account balances, term deposits or capital savings accounts as well as savings plans with building and loan associations (Article 93 para 2 Austrian Banking Act). This means that all savings deposits covered by this paper are subject to deposit insurance.

Until the third quarter of 2008, deposit insurance was capped at EUR 20,000 for natural persons. Between the fourth quarter of 2008 and the end of 2009 no upper limit was enforced. Since January 1, 2010, deposits raised from legitimized account holders who are natural persons have been insured up to an amount of EUR 100,000 per credit institution (Article 103h Banking Act). Deposits made by account holders other than natural persons have also been subject to an upper insurance limit of EUR 100,000 per credit institution since January 1, 2011 (formerly EUR 50,000), under Article 103k Banking Act.

The share of savings accounts with deposits above EUR 50,000 is below 2%. Deposits raised from both natural and other persons that exceed EUR 50,000 per account holder are subject to a direct federal deposit guarantee for the difference between EUR 50,000 and EUR 100,000 (Article 93a para 3

⁴ In general, Austrian credit institutions belong to one of five deposit insurance schemes: Sparkassen-Haftungs AG, Österreichische Raiffeisen-Einlagensicherung reg. Gen. m. b. H., Schulze-Delitzsch-Haftungsgenossenschaft reg. Gen. m. b. H., Hypo-Haftungs-Gesellschaft m. b. H., Einlagensicherung der Banken & Bankiers G. m. b. H. (www.einlagensicherung.at).

Banking Act and Article 103h Banking Act) (Austrian Financial Market Authority – FMA, 2012).

All in all, some 1.2% of all savings accounts come with balances between EUR 50,000 and EUR 100,000. In 2011 this was the category that recorded the highest increase in the number of accounts (+10,217 against 2010) and also the deposit category with the single biggest increase in value (+EUR 722 million in 2011; see table 2 in the annex). This increase may be seen as a direct response to the changes in the deposit insurance scheme, to the extent that wealthy customers had divided savings deposits among several credit institutions for safety reasons.

In the period up to the end of 2009, during which no upper ceiling applied, deposit balances increased in all categories other than the lowest categories with deposits below EUR 20,000. At the time, deposits virtually soared in the highest category of deposits (those with balances exceeding EUR 3 million).

The decision of the federal government to guarantee deposits even above EUR 50,000 so as to build confidence in the Austrian financial sector must therefore have been taken under the assumption that it takes more than the large majority of small savers to maintain financial stability, namely that it is important to guarantee also the deposits of a very small but very wealthy range of investors, as those investors might otherwise take unwanted investment decisions (capital flight). This underlines the eminent significance of distribution analyses in the financial sector, above all with a view to maintaining financial stability. Note that discussing the economic policy issue of who should pay for deposit insurance, the general public or the banking sector, would go beyond the scope of this paper.

4.2 Savings Plans with Building and Loan Associations

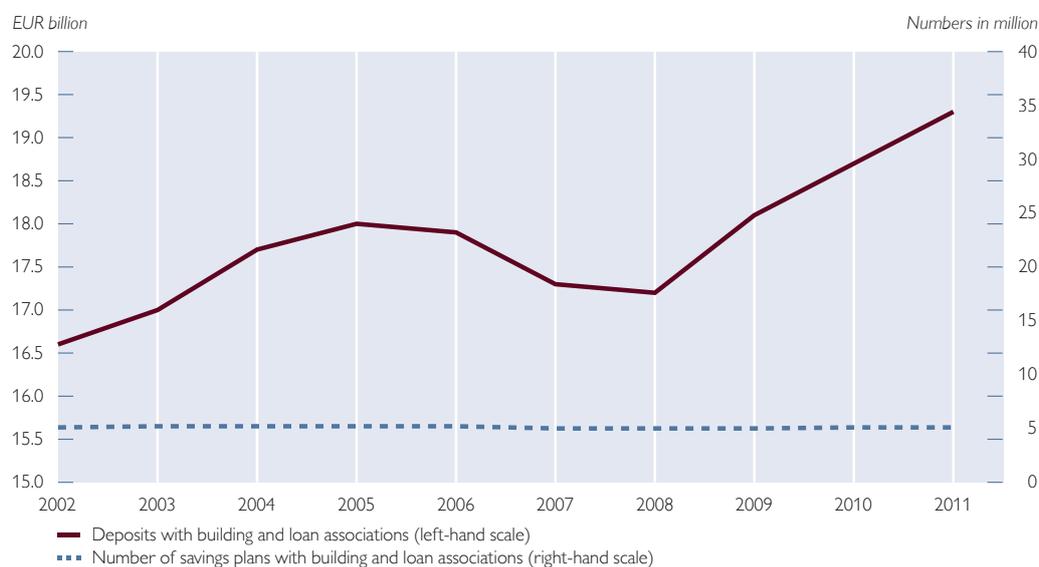
Based on the allocation of accounts to individual banks, it is possible to provide a separate analysis for savings plans with building and loan associations, of which there are about 5 million in Austria. The respective deposits, which total some EUR 19 billion, account for about 12% of the aggregate savings balances. The average deposit on the respective accounts is approximately EUR 3,800, which is rather a small amount compared with other deposit products.

From a risk perspective, savings plans with building and loan associations qualify as a safe form of investment, which would imply that demand should have increased since the onset of the crisis. Moreover, the fact that the maximum amount for which holders of savings plans with building and loan associations are eligible for the government bonus was raised from EUR 1,000 EUR to EUR 1,200 in 2009 may have played a role as well. Looking ahead, it is yet too early to say what effect the decrease of the government bonus in 2012 – one of the measures of the latest consolidation package – may have.

At any rate, the number of savings plans with building and loan associations has remained highly stable over the past ten years. The respective data exhibit neither cyclical nor crisis effects. Since the onset of the crisis, the volume of savings plans with building and loan associations has been on the increase again, mirroring the rise in aggregate savings balances (chart 11). While saving with building and loan associations is very widespread in Austria (around 60% of the Austrian population and 70% of Austrian households hold such savings plans), its significance in terms of volume has remained rather limited.

Chart 11

Savings Plans of Austrian Households with Building and Loan Associations¹



Source: OeNB.

¹ Number of savings deposits of Austrian nonbanks capital-weighted with the savings deposit volumes of Austrian households as a percentage of the savings deposit volume of domestic nonbanks.

5 Conclusions

Savings deposits continued to be a stable source of funding for the Austrian banking system during the crisis. Similarly, savings plans with building and loan associations exhibited a significant degree of stability in the period from 2002 to 2011, which is reviewed here.

A distribution analysis of savings deposits shows a mixed development for different account sizes. In the eight account categories analyzed, the share of savings deposits increased in the upper account classes while they decreased in the lower account categories, which are larger in the aggregate. The Gini coefficient increased continually until 2009 and remained strikingly stable during the crisis. Data reported by banks on their customers' savings balances show that the OeNB's financial wealth survey 2004 understated the degree of wealth concentration also with regard to this highly popular deposit product.

The guarantees provided by the federal government for deposits ranging from EUR 50,000 to EUR 100,000 benefit a small number of wealthy individuals holding savings deposits of this size. The share of savings accounts with deposits above EUR 50,000 is below 2%.

While the focus of the savings account data reported to the OeNB is on savings deposits, the OeNB's financial wealth surveys target above all micro data on households and their investment patterns. First findings of the OeNB's new Household Finance and Consumption Survey (HFCS) will be released at the end of September 2012 in a special issue of the OeNB's quarterly "Monetary Policy & the Economy" and will be made available for academic research in 2013 (www.hfcs.at). The new HFCS data will facilitate extensive analyses into the saving behavior, portfolio choices and portfolio allocation of Austrian households.

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Annex

Table 2

Savings Account Data for the Period from 2002 to 2011

	Number of accounts									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Up to EUR 10,000	20,067,700	19,900,145	19,848,546	19,697,886	19,809,022	19,698,289	19,673,934	19,265,127	19,058,885	18,760,739
EUR 10,000 to EUR 20,000	2,690,148	2,785,107	2,856,617	2,889,711	2,957,997	3,151,856	3,331,201	3,301,367	3,207,943	3,200,669
EUR 20,000 to EUR 50,000	650,044	662,661	669,211	666,054	681,081	718,159	787,875	801,569	798,045	807,007
EUR 50,000 to EUR 100,000	199,218	206,843	211,891	213,932	218,387	232,883	252,683	266,373	271,481	281,698
EUR 100,000 to EUR 500,000	81,995	87,935	92,108	94,073	99,019	108,293	118,861	122,623	119,911	121,761
EUR 500,000 to EUR 1 million	2,908	3,170	3,489	3,579	3,977	4,236	4,788	5,112	5,019	4,833
EUR 1 million to EUR 3 million	921	1,100	1,265	1,323	1,365	1,474	1,660	2,054	1,963	1,856
Above EUR 3 million	152	210	256	284	267	220	310	441	371	366
Total	23,693,086	23,647,171	23,683,383	23,566,842	23,771,115	23,915,410	24,171,312	23,764,666	23,463,618	23,178,929

	Aggregate balances per account category in EUR million									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Up to EUR 10,000	39,606	39,787	40,458	39,906	40,499	40,775	41,311	41,003	40,859	40,820
EUR 10,000 to EUR 20,000	35,974	37,625	38,589	39,297	40,097	42,589	45,120	44,679	43,431	43,350
EUR 20,000 to EUR 50,000	20,157	20,548	20,681	20,584	20,939	22,027	24,078	24,631	24,667	25,056
EUR 50,000 to EUR 100,000	13,658	14,188	14,494	14,573	14,813	15,780	17,132	18,124	18,425	19,147
EUR 100,000 to EUR 500,000	13,993	15,040	15,783	16,162	16,970	18,447	20,212	20,866	20,180	20,221
EUR 500,000 to EUR 1 million	1,972	2,096	2,306	2,365	2,613	2,794	3,161	3,375	3,308	3,190
EUR 1 million to EUR 3 million	1,389	1,647	1,914	2,002	2,031	2,183	2,467	3,098	3,004	2,805
Above EUR 3 million	919	1,248	1,713	1,985	1,828	1,503	1,877	3,192	2,345	2,391
Total	127,667	132,179	135,937	136,874	139,791	146,098	155,359	158,967	156,217	156,981

Source: Savings account data compiled by the OeNB.

Event Wrap-Ups

European Monetary Union: Lessons from the Debt Crisis

Summary of the 40th Economics Conference
of the Oesterreichische Nationalbank

Ernest Gnan,
Esther Segalla¹

Sovereign debt crises have far-reaching consequences and usually go hand in hand with (or can be traced to) banking and – in many cases – currency crises. Therefore, managing and resolving sovereign debt crises pose extraordinary challenges to economic policymakers. Decisive action and reforms have been taken over the past two years to tackle the current European debt crisis. However, given their numerous transmission channels, these measures have been the subject of intense debate among decision-makers, experts, the media and the general public. There are differences in the analysis of the underlying problems, the recommendations of appropriate economic policy responses and in the lessons that should be learned. The 40th Economics Conference of the Oesterreichische Nationalbank (OeNB) from May 10 to 11, 2012, in Vienna brought together renowned national and international experts and practitioners from politics and the economy as well as finance and academia to address these issues from various angles, discussing and identifying possible short- and longer-term solutions with all their advantages and disadvantages.

Recent developments in international bond markets indicated that the euro area's problems cannot be considered to be solved, *OeNB Governor Ewald Nowotny* said in his opening remarks. Several euro area countries are currently facing credibility problems, which are associated with high risk premiums. In such an environment, very high debt levels, caused in part by the consequences of the recession, call for significant fiscal consolidation programs. The resulting social and political instability and weakened economic growth trigger uncertainty among international creditors, reducing the positive effects of consolidation. One lesson of the most recent consolidation effort should be that consolidation programs must be seen in the context of growth prospects, *Nowotny* said. In particular, policymakers must take account of the effects of fiscal consolidation measures over time: In the short run, they have a growth-dampening effect. This makes it necessary to take recourse to exter-

nal policy intervention. Consequently, the help of the European and international community of states appears to be indispensable. At the same time, it is important to create suitable incentives for the countries concerned to implement the necessary comprehensive structural economic reforms. These countries must choose the best possible reform path to ensure that the reforms are in fact politically sustainable and to prevent any renewed negative impact on market confidence.

Decision making in the EU to cope with the crisis has frequently been criticized as being a drawn-out and unwieldy process. One should not forget, however, that the euro area countries and the EU Member States are sovereign democracies, *Nowotny* emphasized. Reforms and assistance programs must be accepted and supported by national parliaments and citizens in both debtor and creditor countries. In addition, critics often fail to recognize that the EU has already taken far-

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reaching steps both to address the crisis and to reform the economic policy framework. In fact, European policy-makers' response to the crisis has greatly advanced European integration. The current problems resulting from the crisis are difficult to resolve, but at the same time they have an enormous potential to let Europe emerge from the crisis with renewed economic and political strength.

In his opening address, *Werner Faymann, Federal Chancellor of Austria*, reasoned that providing solidarity while maintaining financial discipline are the economic policy challenges in the euro area. Past policy efforts (e.g. bank packages, economic stimulus packages, financial market stabilization, fiscal packages, and debt brakes) have been crucial elements in safeguarding the future of the EU, but there is also the need to incorporate social balance and fairness into those concepts. There exists a firm commitment toward the promotion of employment, growth and competitiveness, which creates the necessity to invest in education and training, research and development, innovation and green technologies, infrastructure networks, and health care. To be able to make these investments, governments must ensure that their interest burden does not rise too sharply; therefore, fiscal discipline is of utmost importance, considering that the euro area countries already spend close to EUR 300 billion every year on interest on government debt. A promising initiative to mobilize funding for infrastructure projects is the Europe 2020 Project Bond, with the European Investment Bank (EIB) providing credit enhancement to support private investment in target industries such as transport, energy and broadband. Faymann suggested that if all Member States jointly increased the EIB's capital base by a total of EUR

10 billion, an additional EUR 60 billion in loans would be available for project funding, possibly triggering an investment stimulus of EUR 180 billion. Initiatives like the project bonds are based on two pillars: fiscal discipline on the one hand and the development of new sources of income on the other hand. An example for the latter is the introduction of a financial transaction tax, which helps transfer funds from the financial markets to the real economy. Regarding the drastic increase in youth unemployment, Faymann cautioned against the imminent risk of a lost generation in Europe and pledged for a joint agenda for economists and politicians to find ways how to solve the crisis.

Session 1 presided by *OeNB Governor Ewald Nowotny* was dedicated to the role of the ECB in managing the financial crisis. In his keynote address *Peter Praet, Member of the Executive Board of the ECB*, outlined the challenges faced by an economic policy-maker. In 2007 we observed a liquidity crisis in the money market, which quickly turned into a full-blown financial crisis, following the collapse of U.S. investment bank Lehman Brothers in autumn 2008, and finally into a sovereign debt crisis from May 2010 on. Disentangling the mutually reinforcing risk factors at play proves to be a sophisticated challenge for economists and politicians. The ECB's primary objective, maintaining price stability, remains firm, but additional nonstandard measures had to be introduced to address the liquidity and funding constraints in the banking sector.

Active monetary policy must not be viewed as a panacea for tackling the crisis. Monetary policy alone will not be able to address the causes of the crisis. The key question is not only about the price of central bank money but also the extent to which institutional crisis management is needed.

The ECB has been walking a tightrope: On the one hand, maintaining price stability requires substantial and determined action; on the other hand, rapid action can create wrong incentives for some market participants so that structural changes in other areas are being neglected (e.g. restructuring the banking sector). To avoid a bias, monetary policy making should be timely and compatible with market economy principles.

The ECB's nonstandard measures need to be combined with the firm commitment by political decision makers to reforming the institutional architecture of the EU to put fiscal and macroeconomic policies on a stronger footing and to secure the proper functioning of the monetary policy transmission mechanism.

Klaus Regling, Chief Executive Officer, European Financial Stability Facility (EFSF), reflected on the reasons for and the response of Europe to the sovereign debt crisis. In some Member States, fiscal discipline was not observed and macroprudential problems got out of hand. We are currently observing a transition to permanently lower interest rates. The sole focus in crisis management on fiscal issues was too narrow. Moreover, structural fiscal imbalances were badly calculated due to methodological problems, e.g. Spain and Ireland had nominal fiscal surpluses up until 2005–2006. Eurostat was only able to harmonize Member States' figures but had no power to audit. Financial markets were supervised at the national level and no crisis resolution mechanism had been developed at the European level. Europe's reaction to the sovereign debt crisis was organized on multiple levels and can be divided into national, European and emergency financing actions. Action at the national level included restructuring and auster-

ity plans, but also guarantees of strict conditionality. Measures at the European level included the strengthening of the Stability and Growth Pact, the introduction of automatic sanctions to correct excessive deficits and national debt brakes, new procedures to tackle excessive imbalances at the national level (e.g. EIP), more powers for Eurostat and strengthening the supervisory architecture (e.g. by establishing the ESRB). Emergency financing instruments were introduced to recapitalize banks, e.g. the EFSF/ESM. Their capacity of more than EUR 1 trillion for disbursement made the existing firewalls a substantial and sufficient instrument, Regling said, concluding that EMU will function better in the future.

Panel 1, chaired by *OeNB Vice-Governor Wolfgang Duchatczek,* discussed how to manage the financial crisis from a systemic point of view. *Andreas Dombret, Member of the Executive Board, Deutsche Bundesbank,* opened his speech with the allegory of the Gordian knot to demonstrate that there is no easy way out of the crisis. There is a need to tediously disentangle the different parts of the knot, as solving the knot is not the same as cutting it. Likewise, containing the crisis is something different from solving it. Dombret emphasized the differences between the nonsystemic and the systemic components of the crisis and how they can be intertwined. Nonsystemic elements can be treated in isolation, e.g. a single country's debt crisis, which needs to be solved by an adjustment process at the national level. The contagion loops between different sovereigns, the public and financial sector, and between the financial actors and the real economy generate the systemic crisis component. During the crisis we observed national problems turning into systemic ones. What started as a liquidity

problem can easily turn into a solvency problem. Instruments addressing the systemic component of the crisis are effective firewalls, recapitalization measures and the establishment of a well-balanced macroprudential policy framework. The greatest risk to the effectiveness of a firewall arises from the potential simultaneity of payouts. Publicly-assisted recapitalization of the banking system is crucial to avoid excess deleveraging. But neither firewalls nor recapitalization efforts are substitutes for restoring solvency through economic adjustments and structural reforms.

Federico Sturzenegger, President of Banco Ciudad de Buenos Aires, observed that the approaches to resolving the Greek government debt crisis resemble a replica of a 1980s package and have been promoted regardless of the discussion, during the past decade, of mechanisms to strengthen the sovereign debt market (e.g. the Strategic Debt Restructuring Mechanism, collective action clauses, Calvo's minimum price scheme, the Global Stabilization Mechanism, regional hubs and Precautionary/Flexible Contingent Lines). Drawing on lessons from the Argentinian case, the fixed exchange rate regimes and the high exposure of the financial sector to sovereign risk are the main similarities between Argentina and the European countries. With respect to dissimilarities, Argentina had a simultaneous liquidity and solvency crisis, whereas in Europe only a few countries are suffering under a solvency crisis, and liquidity, on the other hand, should not be an issue. In Europe the ECB can provide liquidity, whereas Argentina was not able to provide liquidity in U.S. dollars. The size of the financial sector is substantially larger in Europe and therefore the interconnectedness of sovereign debt restructuring with the

health of the financial sector is more critical. In order to isolate the financial sector from exposure to sovereign debt risk, Argentina took a series of different measures. Banks were only allowed to have assets applied to sovereign debt within a particular range of caps, loans were pledged against tax collections and lending to the public sector had to be authorized jointly by the central bank and the ministry of finance. Argentina temporarily reduced capital and liquidity requirements to avoid credit contraction. The above measures were combined with the obligation of banks not to distribute dividends. Furthermore, Sturzenegger stressed that debt restructuring should be implemented through maturity extension at relatively low interest rates to avoid forcing substantial losses on the financial sector in the short run.

Panel 2 moderated by *Martin Summer, Head of Division (OeNB)*, presented arguments on how private creditors should be involved in debt restructuring. *Thorsten Beck, Professor at the University of Tilburg*, started the discussion by asserting that the current crisis is a child of the 2008–09 recession and the failure to address deficiencies in the euro area's institutional structure. In particular, it made obvious the financial trilemma of the impossibility to maintain financial stability with European banks doing business across borders but regulation remaining a national responsibility. While we observe a lot of benefits from healthy cross-border banking through the diversification of domestic banks, there are also increased risks from higher volatility in capital flows and contagion. It is crucial to develop a European-level framework together, including a strong resolution authority, to overcome home-country biases in regulation. Furthermore monetary and financial stability should no longer be

treated as separate goals. Rather, a new framework for macro stability needs to incorporate macroprudential regulation which takes into account asset price developments as part of monetary policy in addition to microprudential regulation. The close link between sovereign debt and banks holding large shares of domestic bonds requires that asset concentration ratios take such a home bias into account. Another important issue is the establishment of insolvency procedures for sovereign debtors at the EU level. Beck highlighted the importance of untying the banking and sovereign debt crisis by introducing a new safe asset based on a mutual fund structure containing euro area countries' government debt (e.g. in proportion to their GDP). This fund can then issue tradable securities whose payoffs are the joint payoffs of the bonds in its portfolio. An introduction of such a new asset needs to go hand in hand with institutional reforms, including recapitalizing and restructuring the banking sector. This would guarantee the regulatory underpinning necessary for maintaining a stable and efficient financial system.

Loriana Pelizzon, Professor at the University Ca'Foscari Venice, addressed the empirical challenges of measuring contagion effects, and how different propagation works after a negative shock appears. A simple correlation between two variables does not quantify contagion effects as an outcome of propagation if crisis times are associated with higher volatility. Comparing credit default swaps for different European countries using quantile regressions, she concluded that the propagation of shocks has been remarkably stable and the risk spillover among the countries is not affected by the size of the shock. But this analysis does not tell the complete story as cross-sector banks

only embody one component of a quite complex financial world. Other actors such as hedge funds, brokers, dealers, and insurance companies have also become increasingly interconnected, thus increasing the level of systemic risk in the whole financial industry. Pelizzon concluded providing specific policy recommendations, e.g. that banks should be recapitalized with multi-period payments and a strict no-dividend payout imposition.

Session 2 was moderated by *Ernest Gnan, Head of Division (OeNB)*, and dealt with the question of how to contain systemic risk and debt restructuring. *Albrecht Ritschl, Professor at the London School of Economics*, offered a historical perspective on the European debt crisis by provokingly asking the question whether Germany owes debt to Greece. While the answer to this question is no, the thought experiment remains valid, he claimed. After World War II, Germany was one of the world's largest debtors, with foreign debt amounting to approximately 90% of Germany's 1938 GDP. Germany's economic recovery is attributable to large-scale debt relief and a shift of the bill to the allies. The London Debt Agreement in 1953 was negotiated between Germany on the one part and most other Western countries, including Greece, on the other part and postponed the clearing of debt and occupation costs to a future German unification. The settlement of debt and costs never took place. According to Ritschl, the lessons to be learnt from history are, first, that clearing mechanisms are abused. During World War II Germany appropriated large amounts of funds, while TARGET2 has now released large funds from Germany. He stressed that when we observe a freeze in the capital market, it matters indeed where the money was issued. Another lesson is that in

order to prevent debt default we need to micro-manage debtors' fiscal and interest rate policies. The third lesson is that technocratic governments lack democratic legitimacy and ultimately lead to debt default and domestic political turmoil. Ritschl therefore advocated drastic debt forgiveness for Greece to allow its economic recovery.

Jakob von Weizsäcker, Head of Department at the Thuringian State Ministry for Economics, elaborated on the relevance of euro bonds, based on three arguments. First, the current crisis architecture may not be sufficient to stand a severe stress test scenario; second, euro bonds are a signal of firm commitment to the euro project; and, third, euro bonds are a safe asset. The blue bond proposal distinguishes between blue bonds and red debt to achieve two seemingly opposite objectives (higher and lower yields) at the same time. The idea is to split debt into a senior (blue) part, which covers debt issued up to 60% of GDP as a threshold, and a junior (red) part, consisting of Member States additional debt above the blue part's 60% threshold. Blue bonds would be repaid prior to red bonds. This would result in differing risk assessments, and, therefore, different interest rates. The proposal rests on several integral pillars, such as joint and several liabilities for the blue bonds, orderly default procedures and collective action clauses for red debt, strengthening of fiscal discipline due to more expensive public-sector borrowing at the margin and the introduction of a European debt agency to counter governments' incentives to service red debt first. For the transition phase, von Weizsäcker proposed to create a debt redemption scheme and to allow a sufficiently big haircut now.

After dinner, participants were invited to an evening discussion with

Maria Fekter, Federal Minister of Finance of Austria. OeNB Governor Ewald Nowotny praised the good cooperation between the Ministry of Finance and the OeNB with regard to banking supervision. Fekter explained that the crisis is being tackled with a four-step programme: first, help for the countries in need (e.g. with bilateral loans and credit, EFSF, ESM), second, a reform of institutional frameworks (e.g. by introducing debt brakes), third, monitoring the implementation of the necessary measures (e.g. through the Troika) and, fourth, sanctions or an increase in help if necessary. With respect to Austria, Fekter pointed out that the federal government had agreed with the governors of the nine Austrian federal provinces to achieve a zero deficit by 2016. Austria remains in a strong position, with a 2.6% deficit, the lowest unemployment rate in Europe, and above average economic growth. Nevertheless, the reduction of the public debt level (currently at 72% of GDP) requires strict fiscal consolidation. In order to cut debt and foster economic growth at the European level, a legal framework needs to be developed that comprises fiscal consolidation, debt brakes, and fiscal discipline in all countries. The biggest expenditure burden in Austria remains the pension system. With the current average actual retirement age at 58, the goal is to keep workers longer in employment, which would both reduce costs and benefit economic growth. Fekter called for moderate policies between Keynesian state interventionism and Hayekian reliance on free markets. Issuing new public debt is not a solution; rather, there should be a mix of market incentives, innovative power and state regulation. Fekter wished for a more dynamic path in economic development and intergenerational fairness to secure prosperity.

Session 3 in the morning of the second conference day was chaired by *Peter Mooslechner, Director of the OeNB's Economic Analysis and Research Department*. *Joshua Aizenman, University of California, Santa Cruz and National Bureau of Economic Research*, discussed the question of how to strike a balance between short-term stabilization and forward-looking reform by analyzing first the development of currency unions and then financial sector regulation. While early reforms are in general desirable, in practice, they are often postponed and a crisis is needed to actually implement them. The completion of Economic and Monetary Union (EMU) was driven by exaggerated forced optimism about the endogeneity of optimal currency areas. However, creating institutions with the aim of overcoming fiscal short-sightedness apparently requires painful learning. Convergence to an “ever closer union” is not assured. The celebrations of the 10th anniversary of EMU in 2008 were premature. The asymmetric shocks hitting Europe in 2008–09 (peripheral euro area countries vs. Germany) awakened the financial market to the incompleteness of the EMU project. The euro has been the outcome of Europe's history over the past 200 years rather than the optimal currency area logic. Economic integration may have overshoot the people's (and the political) willingness to integrate. Likewise, the U.S. dollar is the outcome of 200 years of painful learning, including a civil war, the defaults of eight states, and the Great Depression. By comparison, the euro area is still in its infancy, experiencing its first painful maturing crisis. Put differently, the euro is a “half pregnancy.” The crisis has forced the euro area to move fast on the learning curve. For EMU to succeed, the EU center must be granted more negotiating power

relative to the Member States. To monitor the fiscal scope of Member States, the EU fiscal rules should relate public debt and deficit to the tax base, which would be preferable to the currently used deficit- and debt-to-GDP ratios; the ratios to the tax base can also explain risk premiums on sovereign debt more reliably. EMU reforms must be implemented while memories of the crisis are still fresh.

The pendulum of financial regulation tends to swing between under-regulation in good times and over-regulation following a crisis (the paradox of regulation). It is one of the inherent problems of regulation that its success in avoiding crises is imperceptible, whereas its costs and the financial sector's interests spark opposition to regulation. Conversely, over-regulation after a crisis generates a larger cost of stagnation, which is often insufficiently taken account of in the political discourse. Central banks and financial regulators should be more independent of the financial industry they oversee and regulate. Financial regulation must be centralized to be able to adequately address systemic risks and avoid regulatory arbitrage. Global regulatory minimum standards reduce the risk of regulatory arbitrage and increase the costs of deregulation. The challenge is to create a regulatory system immune to the paradox of regulation.

The ways out of the crisis were the topic of the concluding panel discussion chaired by *Peter Mooslechner (OeNB)*. *Sylvie Goulard, Member of the European Parliament*, and *Professor Wilhelm Kohler, Universität Tübingen*, explored who should provide assistance to what extent and in what way. Goulard emphasized that Europe had enacted comprehensive reforms over the past few years. The Greek crisis could have been predictable. The EU needs a strong center, a

democratic body committed to transparency. In contrast to the European Parliament, which works in an open and transparent way, the European Council meets almost like a private club and takes decisions that usually lack control and – sometimes – objectivity. Rules alone are not enough for a Union-wide economic and structural policy. There is a broader scope to competition and location. Also, what people usually criticize as “bureaucracy” is not the EU’s problem. Rather, the lack of political union must be addressed. In other words, the interests of the EU must take priority over national interests. At the moment, the north-south divide is one of the greatest threats to Europe. Taking up Aizenman’s metaphor of the “euro baby”, Goulard said that the baby had been born and will be living, and Europe will take all the necessary measures. The EU and the euro need the full and sincere support of politicians. Stereotyping and bashing partners (“lazy”, “rigid”, etc.) is harmful and does not help resolve problems.

Professor Wilhelm Kohler, Universität Tübingen, pointed out that misguided fiscal policies in combination with mispricing of risks by the financial markets had caused the sovereign debt crisis. Next to excessive private sector borrowing, fiscal imbalances have given rise to massive external imbalances, which now have to be resolved by external or internal devaluation (with or without deflation). Increasing productivity fast is a crucial element in responding to the crisis. At the same time Kohler warned that growth alone would not suffice to alleviate imbalances. The monetary policy stance is already very expansionary, higher inflation is no viable solution to the debt

crisis. The question as to whether the central bank should act as lender of last resort in government bond markets must be given due consideration. Country bailouts by other countries can buy time for reforms and fiscal consolidation and avoid adverse imbalances but bear the risk of moral hazard. As regards the pace of fiscal consolidation, going too fast could lead to a recession/debt trap, a double dividend through non-Keynesian expectation effects of expansive consolidation is theoretically possible, but in practice unlikely. Still it is unavoidable to bring public finances back on a sustainable track. Whether the TARGET2 liabilities caused by current account deficits and/or capital flight are a problem depends on whether the euro area is a genuine currency union or a mere fixed exchange rate system.

Finally, in the course of the Economics Conference, *OeNB President Claus Roidl* and *OeNB Governor Ewald Nowotny* introduced the winner of this year’s *Klaus Liebscher Award*. *Harald Oberhofer, Universität Salzburg*, received the prize for his scientifically rigorous and highly policy-relevant study entitled “Firm Growth, European Industry Dynamics and Domestic Business Cycles,” which was selected from a large number of excellent submissions. In his paper, the author conducts a systematic empirical analysis of the links between national and European business cycles, focusing on the question of how this interaction affects European industrial enterprises. The data show that despite substantial progress in European integration, national business cycles have a larger impact on firm growth than pan-European developments.

Notes

List of Studies

Published in Monetary Policy & the Economy

For further details on the following publications, see www.oenb.at.

Issue Q2/11

Austria's Economy Moves beyond the Crisis
Powerful Economic Growth Provides a Tailwind to Reduce Budget Deficits
Economic Outlook for Austria from 2011 to 2013 (June 2011)
Christian Ragacs, Klaus Vondra

Inflation Differentials between Austria, the Euro Area, Germany and Italy
Friedrich Fritzer

Heterogeneity in Euro Area Consumers' Inflation Expectations:
Some Stylized Facts and Implications
Ernest Gnan, Johannes Langthaler, Maria Teresa Valderrama

The Swiss Economy's Resilience to Crisis and Its Lessons
for Austria
Andrés Fuentes, Paul Ramskogler, Maria Antoinette Silgoner

The Future of European Integration: Some Economic Perspectives
Summary of the 39th Economics Conference of the Oesterreichische Nationalbank
Ernest Gnan, Paul Pichler

Issue Q3/11

Growth Weakens Worldwide
Gerhard Fenz, Josef Schreiner, Maria Silgoner

Literature Review on the Economic Effects of the Euro on Austria
Christian Beer

Austria's Manufacturing Competitiveness
Christian Ragacs, Beate Resch, Klaus Vondra

European Financial Supervision: The Long Road to Reform
Wolfgang Pointner, Katharina Wolner-Röjblhuber

Analyzing the Macroeconomy: Dynamic Stochastic General Equilibrium
Modeling versus Agent-Based Modeling
Martin Summer

Issue Q4/11

Crisis of Confidence to Trigger Marked Slump in Growth in 2012
Economic Outlook for Austria from 2011 to 2013 (December 2011)
Gerhard Fenz, Martin Schneider

Economic Governance Reform and Financial Stabilization in the EU
and in the Eurosystem – Treaty-Based and Intergovernmental Decisions
Sylvia Gloggnitzer, Isabella Lindner

Macro Coordination under the European Semester
Walpurga Köhler-Töglhofer, Peter Part

Europe 2020 – A New Framework for New Growth
Maria Auböck, Christina Burger, Elmar Mangler

What to Expect from the Latest Reform of the Stability and Growth Pact
Johannes Holler, Lukas Reiss

Prevention and Correction of Macroeconomic Imbalances:
the Excessive Imbalances Procedure
Sebastian Essl, Alfred Stiglbauer

Crisis Financing in the EU
Franz Nauschnigg, Paul Schieder

Issue Q1/12

The Economy has Bottomed Out
Martin Schneider, Josef Schreiner, Maria Silgoner

Euro Cash in Austria, Ten Years On
Alexandra Koch, Doris Schneeberger

Euro Cash in Central, Eastern and Southeastern Europe
Doris Ritzberger-Grünwald, Thomas Scheiber

The Euro – Public Opinion in the Ten Years after the Euro Changeover
Manfred Fluch, Sabine Schlögl

How Euro Banknotes in Circulation Affect Intra-Eurosystem Balances
Lenka Kršnakova, Maria Oberleithner

Understanding TARGET2: The Eurosystem's Euro Payment System
from an Economic and Balance Sheet Perspective
Clemens Jobst, Martin Handig, Robert Holzfeind

The Pass-Through of Commodity Prices to Consumer Prices of Selected Products
Fabio Rumler

Price Level Convergence Before and After the Advent of EMU
Friedrich Fritzer

Issue Q2/12

Austrian Economy Prevails in Bleak International Environment
Economic Outlook for Austria from 2012 to 2014 (June 2012)
Christian Ragacs, Klaus Vondra

Business Cycle Synchronization in the Euro Area
and the Impact of the Financial Crisis
Martin Gächter, Aleksandra Riedl, Doris Ritzberger-Grünwald

Analyzing Corporate Loan Growth in Austria
Using Bank Lending Survey Data
Conceptual Issues and Some Empirical Evidence
Christian Beer, Walter Waschiczek

Savings Deposits in Austria – A Safety Net in Times of Crisis
Michael Andreasch, Pirmin Fessler, Martin Schürz

European Monetary Union: Lessons from the Debt Crisis
Summary of the 40th Economics Conference of the Oesterreichische Nationalbank
Ernest Gnan, Esther Segalla

Periodical Publications

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Geschäftsbericht (Nachhaltigkeitsbericht) Annual Report (Sustainability Report)

German
English

This report reviews the OeNB's mandate, responsibilities and organization as well as the monetary policy of the Eurosystem, economic conditions and developments both in the financial markets and in financial market supervision during the reporting year. Furthermore, it contains the OeNB's financial statements, Intellectual Capital Report and Environmental Statement.

Geldpolitik & Wirtschaft Monetary Policy & the Economy

German
English

Monetary Policy & the Economy provides analyses and studies on central banking and economic policy topics and is published at quarterly intervals.

Finanzmarktstabilitätsbericht Financial Stability Report

German
English

This semiannual report contains analyses of Austrian and international developments with an impact on financial stability and studies designed to offer in-depth insights into specific financial stability-related topics.

Focus on European Economic Integration

English

This quarterly publication presents peer-reviewed studies on macrofinancial and monetary integration in Central, Eastern and Southeastern Europe (CESEE) as well as related country analyses and statistics. This publication reflects a strategic research priority of the OeNB.

Statistiken – Daten & Analysen

German, English summaries

This quarterly publication contains analyses of Austrian financial institutions, cross-border transactions and positions as well as financial flows. Some 200 tables provide information about macroeconomic, financial and monetary indicators. On the OeNB's website, these tables are also available in English. In addition, this series includes special issues on selected statistics topics published at irregular intervals.

Research Update

English

This quarterly newsletter is published online (www.oenb.at/research-update) and informs readers about selected findings, research topics and activities of the OeNB's Economic Analysis and Research Department.

Proceedings of OeNB Workshops

German, English

These proceedings contain papers presented at OeNB workshops at which national and international experts discuss monetary and economic policy issues.

Working Papers

English

This online series provides a platform for the publication of studies by OeNB economists or external authors on particular monetary policy topics.

Conference Proceedings of the OeNB's Economics Conference

English

These proceedings contain contributions to the OeNB's annual Economics Conference, an international platform for exchanging views and information on monetary and economic policy as well as financial market issues.

Conference Proceedings of the OeNB's Conference on European Economic Integration

English

These proceedings contain contributions to the OeNB's annual Conference on European Economic Integration (CEEI), which focuses on Central, Eastern and Southeastern European issues and the ongoing EU enlargement process.

Publications on Banking Supervision

German, English

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