

# MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

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

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*Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank or of the Eurosystem.*

# 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 are provided with accommodation on demand and have, as a rule, access to the department's data and computer re-

sources and to research assistance. Their research output will 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 2014 should be e-mailed to

*eva.gehringer-wasserbauer@oenb.at*  
by November 1, 2013.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on May 1, 2014.

# Analyses

# Robust Recovery Remains Elusive

Economic Outlook for Austria from 2013 to 2015 (June 2013)

Christian Ragacs,  
Klaus Vondra<sup>1</sup>

## 1 Summary

In its economic outlook of June 2013, the Oesterreichische Nationalbank (OeNB) slightly revised downward the growth prospects for the Austrian economy largely owing to weaker demand for Austrian exports. The OeNB currently projects real GDP growth of 0.3% for 2013 and 1.5% for 2014, signifying a downward revision by 0.2 percentage points for each year from its outlook of December 2012. The OeNB does not expect the Austrian economy to return to long-term average growth of 1.8% before 2015.

Inflation, which rose during the second half of 2012, will ease over the coming months. After 2.0% in 2013, HICP inflation will hover just below 2% in the years to follow (2014: 1.7%; 2015: 1.8%). In 2013, the general government budget deficit will improve to 1.7% of GDP (2012: 2.5%) despite the sluggish economy (excluding any addi-

tional costs incurred by the “bank bailout package”). The OeNB expects a further reduction in general government deficit to 1.2% of GDP by 2015.

The crisis in the euro area rippled across to other regions in 2012, with a spillover effect on world GDP growth. In the U.S.A., automatic across-the-board spending cuts (also called “fiscal cliff”) took effect in early 2013. Although the growth momentum of Asian emerging economies also slowed in early 2013, they will continue to drive the growth of the world economy over the forecast horizon. In Japan, comprehensive measures for stimulating economic activity were implemented, which should strengthen both domestic and global growth in the forecast period. The crisis in the euro area affected countries in Central, Eastern and Southeastern Europe particularly badly.

Economic output in the euro area has been steadily contracting since the

Chart 1

## Real GDP Growth (Seasonally and Working Day-Adjusted)

Quarterly change in %



Source: Eurostat, OeNB.

Editorial deadline:  
May 29, 2013

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fourth quarter of 2011. This means the euro area slipped back into recession after the deep recession in 2009. In 2012, the continued crisis in southern euro area countries also spread to euro area members in Central and Northern Europe, causing an unexpected recession in some of these countries (the Netherlands, Belgium, Finland). But also the GDP growth of other European economies was adversely affected owing to their close economic integration with the euro area. Germany registered positive, albeit historically very low, real GDP growth in 2012 and the French economy stagnated. The “Cypriot crisis” and the temporary political deadlock stemming from the parliamentary elections in Italy triggered a renewed deterioration in sentiment in early 2013, which resulted in a further dampening of real economic momentum. Of the major European economies, only Germany currently has a positive growth outlook over the entire forecast period whereas France, Italy and Spain should expect economic output to contract at least in 2013. In addition, the economic outlook for many smaller euro area countries has markedly deteriorated in recent months (and also compared with the December 2012 outlook).

Austria was unable to avoid this development in Europe. Its economy has stopped growing since the second quarter of 2012. Sagging export growth was not sufficiently offset by domestic demand. The little export growth was primarily driven by services exports. Private consumption stagnated, and gross fixed capital formation – which is particularly sensitive to the economic cycle – shrank. This decline was fueled primarily by three factors: the European debt crisis, the related recession in Austria’s key sales countries and the resulting continued uncertainty about future

sales opportunities. By contrast, both domestic and external financing conditions developed extraordinarily favorably. With external conditions gradually improving, exports and investment will see a pronounced recovery from mid-2013 and, notably, in 2014 and 2015.

Despite unexpectedly dynamic employment growth when compared internationally, real private consumption in Austria stagnated in 2012, registering growth of just 0.2%. This phenomenon was attributable to inflation-induced weak real wage growth, which – as in previous years – dampened household income growth. This trend will continue also in 2013, which is why growth in private consumption demand is not expected to accelerate. Private consumption demand will not drive GDP growth again until real household income growth reaccelerates in the next few years. Household income growth did not in its entirety feed into consumption in 2012: households used a portion of this growth to increase the saving ratio, which had fallen in previous years. The saving ratio will remain at its 2012 level until end-2015.

Employment has further continued to grow robustly despite real GDP growth stagnating since spring 2012. Although growth in aggregate employment remained at 1.1% in 2012, its momentum has slowed recently. Despite the fragile economy, a further increase in payroll employment is projected for 2013, although it will be comparatively weak at 0.6%. In 2014, employment growth will be similarly dampened as in 2013 for economic reasons. Employment is not expected to regain momentum before 2015. Altogether (EU-8 as well as Bulgaria and Romania), a relatively smaller degree of inward migration is anticipated over the forecast period than has been registered since the liberalization of the labor market in

2011. Despite employment growth, unemployment also rose in 2012 owing to expanding labor supply. The unemployment rate will inch up slightly to 4.8% (2013) and 4.9% (2014), still boasting the lowest level in both the EU and the euro area.

The downtrend in HICP inflation evident since early 2013 will continue until year-end. The key factors for this decline remain, above all, steadily falling crude oil prices and sharply slowing wage cost growth. HICP inflation of 2.0% is projected for 2013. Inflation

Table 1

### OeNB June 2013 Outlook for Austria – Key Results<sup>1</sup>

	2012	2013	2014	2015
<b>Economic activity</b>				
<i>Annual change in % (real)</i>				
Gross domestic product	+0.8	+0.3	+1.5	+1.8
Private consumption	+0.2	+0.2	+0.9	+1.2
Government consumption	+1.0	+0.7	+1.3	+1.2
Gross fixed capital formation	+1.4	-0.5	+2.2	+2.7
Exports of goods and services	+1.4	+1.7	+4.4	+5.5
Imports of goods and services	+1.1	+1.3	+4.2	+5.4
<i>% of nominal GDP</i>				
Current account balance	+1.8	+2.3	+2.5	+2.7
<b>Contribution to real GDP growth</b>				
<i>Percentage points</i>				
Private consumption	+0.1	+0.1	+0.5	+0.6
Government consumption	+0.2	+0.1	+0.2	+0.2
Gross fixed capital formation	+0.3	-0.1	+0.4	+0.6
Domestic demand (excluding changes in inventories)	+0.6	+0.1	+1.2	+1.4
Net exports	+0.3	+0.3	+0.4	+0.4
Changes in inventories (including statistical discrepancy)	-0.1	-0.1	+0.0	+0.0
<b>Prices</b>				
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+2.6	+2.0	+1.7	+1.8
Private consumption expenditure (PCE) deflator	+2.9	+2.2	+1.6	+1.8
GDP deflator	+2.0	+1.8	+1.3	+1.6
Unit labor costs in the total economy	+3.3	+2.7	+0.9	+1.2
Compensation per employee (at current prices)	+2.9	+2.4	+2.0	+2.3
Productivity (whole economy)	-0.3	-0.2	+1.1	+1.1
Compensation per employee (real)	+0.1	+0.2	+0.4	+0.5
Import prices	+1.4	+0.6	+1.4	+1.5
Export prices	+1.3	+0.8	+1.3	+1.6
Terms of trade	-0.1	+0.2	-0.1	+0.1
<b>Income and savings</b>				
Real disposable household income	+0.7	+0.2	+0.9	+1.3
<i>% of nominal disposable household income</i>				
Saving ratio	7.7	7.7	7.7	7.7
<b>Labor market</b>				
<i>Annual change in %</i>				
Payroll employment	+1.2	+0.6	+0.4	+0.7
<i>% of labor supply</i>				
Unemployment rate (Eurostat definition)	4.4	4.8	4.9	4.9
<b>Budget</b>				
<i>% of nominal GDP</i>				
Budget balance (Maastricht definition)	-2.5	-1.7	-1.4	-1.2
Government debt	73.7	74.4	74.0	72.8

Source: 2012: Eurostat, Statistics Austria; 2013 to 2015: OeNB June 2013 outlook.

<sup>1</sup> The outlook was drawn up on the basis of seasonally adjusted and working-day adjusted national accounts data. Therefore, the values for 2012 may deviate from the nonadjusted data released by Statistics Austria.

will ease to 1.7% in 2014 before ticking up slightly again to 1.8% in 2015 owing to cyclical developments.

The general government budget deficit remained constant at 2.5% of GDP in 2012. The rise in capital transfers to banks and the relatively vigorous increase in social benefits were almost offset by subdued growth in other expenditure and by a fairly sharp increase in receipts. Further structural improvements in the budget balance are expected over the forecast horizon, with the structural balance likely to stand at some –1% of GDP in 2015 (2012: some –1.5% of GDP).

## 2 Technical Assumptions

This forecast for Austria is the OeNB's contribution to the Eurosystem's June 2013 staff projections. The forecast horizon ranges from the first quarter of 2013 to the fourth quarter of 2015. May 15, 2013, was the cutoff date for data underlying the assumptions on global growth as well as interest rates, exchange rates and crude oil prices. The OeNB used its macroeconomic 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 up to the fourth quarter of 2012. The data for the first quarter of 2013 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 for the three-month EURIBOR, namely 0.2% in 2013, 0.3% in 2014 and 0.5% in 2015. Long-term interest rates, which are based on market expectations for ten-year government bonds, come to 1.8% (2013), 2.1% (2014) and 2.4% (2015).

The exchange rate of the euro vis-à-vis the U.S. dollar is assumed to stay constant at USD 1.31. The projected development of crude oil prices is based on futures prices. The oil price assumed for 2013 is therefore USD 105.5 per barrel of Brent, while the prices for 2014 and 2015 are set at USD 100.0 and USD 96.2, respectively. The prices of commodities excluding energy are also based on futures prices over the forecast period.

## 3 Euro Area Crisis Still Dampens World Economy

The euro area crisis again had a knock-on effect on the global economy in 2012, with global GDP growth (excluding the euro area) slowing from 4.3% (2011) to 3.6% (2012). Renewed financial distortions meant that the implemented monetary policy measures did not achieve their desired outcomes in many euro area countries. The Governing Council of the ECB therefore approved a program of outright monetary transactions (OMTs) in late summer 2012. Within the framework of OMTs, the Eurosystem – subject to strict conditionality – can make unlimited purchases in secondary sovereign bond markets of bonds issued by euro area countries. This program, together with other stabilization measures at a European level, brought a growing measure of calm on the financial markets. In particular, the sovereign bond markets steadied and both confidence and leading indicators improved. In early 2013, however, the political uncertainties stemming from Italy's parliamentary elections and the negotiations surrounding the Cypriot crisis triggered a renewed deterioration in sentiment. To counter the problems in the monetary policy transmission process that are still prevailing in certain Southern European countries (supply-side credit restrictions),

the ECB agreed on May 2, 2013, to lower its key interest rate by 0.25 percentage points to a historically low 0.5% and to contemplate further “unconventional monetary policy measures.” The economic upturn in Europe expected for mid-2013 remains marked by major uncertainties, however. The recovery of the global economy is proceeding at a modest pace and is being driven primarily by the emerging economies, as well as by the U.S.A. and Japan. GDP growth of the global economy excluding the euro area is not expected to gather significant momentum in 2013 as a whole (3.6%) and will not resume growing at a faster pace until 2014 (4.2%).

The U.S. economy – just like Europe – is hampered by fiscal consolidation constraints. The across-the-board U.S. government budget cuts, which took automatic effect in spring 2013, are currently dampening not only the U.S. economy but also global export demand. While the U.S. economy had regained momentum in the course of 2012 – accompanied by the real estate and labor market’s growing recovery – a slack fourth quarter in 2012 that was marked by a decline in defense expenditure briefly dampened this development. In the first quarter of 2013, however, the U.S. economy returned to relatively strong growth. The U.S. economic outlook for 2013 will be marked by muted consumption demand (both in the private and government sector) owing to the consolidation measures (GDP growth: 1.9%). For the next few years, however, forecasts predict a marked acceleration in growth (2014: 2.6%, 2015: 3.0%).

In addition to the aftermath of the tsunami disaster, Japan’s economy suffered from a strong yen and from sluggish international demand in 2011/12. In early 2013, the Japanese economy

staged a robust recovery following a temporary slump in growth in mid-2012. The unexpectedly high growth is attributable to the announcement of several economic stimulus packages and to the easing of monetary policy, resulting in a sharp depreciation of the yen. The Bank of Japan (BoJ) upgraded its inflation target from 1% (“goal”) to 2% (“target”) and announced an asset purchase program for buying securities as well as the introduction of quantitative and qualitative monetary easing. BoJ intends to meet the new price stability target as early as possible and no later than in two years’ time.

The Chinese and Indian economies unexpectedly lost steam in early 2013. This sluggishness is attributed to temporary factors, however. Structurally, both countries are still able to generate annual growth of 6% to 8%. In China, growth should regain momentum in the course of 2013, driven by housing investment, robust consumption growth and rapid credit growth. An upward growth path over the forecast period is also expected for India.

In 2012, economic momentum in Central, Eastern and Southeastern European (CESEE) countries lost considerable steam in view of Europe’s bleak economic climate. The recession in the euro area and tough international financing conditions dampened the economy markedly. Real GDP growth in the CESEE region slumped to only 1.1% and will fall just below 1% in 2013. However, this development diverges greatly, depending on the specific country concerned. While, for instance, the Baltic states, Slovakia and Poland generated positive growth, other CESEE countries (Hungary, Slovenia and the Czech Republic) were in recession. Growth in this region will reaccelerate in conjunction with the recovery of the euro area economy.

In the United Kingdom, the economy grew modestly in the first quarter of 2013 and is expected to recover only gradually, given still tight lending conditions, the need to reduce high levels of household debt and fiscal consolidation.

Owing to the sovereign debt crisis in Europe, the euro area slipped back into recession in 2012 (GDP growth:  $-0.5\%$ )<sup>2</sup>. Since mid-2011, the number of jobless persons has been rising steadily, with the unemployment rate standing at 12.1% in March 2013. The recession in peripheral countries is, however, also accompanied by a reduction in current account deficits. In view of the high level of uncertainty, companies in the euro area curtailed their investment considerably in 2012 and ran down their inventories. In addition to fiscal consolidation efforts, high unemployment and the related downward pressure on wages are dampening net household income. This is why even real consumer demand visibly plummeted again. Positive growth impetus came from net exports only. Growth remained negative in the first quarter of 2013 ( $-0.2\%$  on a quarterly basis). From the second half of 2013, GDP growth is expected to recover modestly, driven by domestic demand and growing import demand from countries outside the euro area. The recovery in domestic demand will be fueled by two factors: First, real income growth will accelerate owing to lower inflation. Second, historically extraordinarily low interest rates, an expected removal of supply-side credit restrictions and a looser fiscal policy compared with previous years should further the recovery of euro area economies. The OeNB there-

fore stands by its expectation of a gentle upturn from the second half of 2013. However, this upturn will prove to be only very modest and – as in previous years – remain dogged by vast disparities. In particular, the very high levels of unemployment in the countries especially badly hit by the crisis (Greece, Italy, Portugal, Slovenia, Spain and Cyprus) will barely fall – and in some instances even continue to rise.

In 2012, the crisis in the European periphery also spread to Central and Northern European countries, unexpectedly triggering recession in some countries (the Netherlands, Belgium, Finland). Neither Germany nor France – the two major euro area economies – managed to escape the effects of this development. Although Germany generated real GDP growth of 0.7% in 2012, economic output shrank unexpectedly sharply in the fourth quarter of 2012. The first quarter of 2013 was also unexpectedly weak owing to an excessively cold winter. Despite the European fiscal crisis, fundamental indicators of the German economy have continued to improve in recent years: competitiveness has increased, employment has been further boosted and unemployment has fallen steeply. Accordingly, the engine of current German GDP growth is private consumption. In 2013, Germany's economy will register positive, albeit historically low, GDP growth. With the recovery of the international economy and the related demand stimuli for exports, the German economy will regain momentum in the course of the year.

In France – unlike Germany – the economy stagnated in 2012 and even contracted in early 2013. Necessary

<sup>2</sup> Data relating to GDP growth, contributions to GDP growth, employment (national accounts, in real terms, seasonally adjusted and change against previous period) and inflation (change against same period of previous year) for the euro area and euro area countries are data provided by Eurostat unless specified otherwise.

fiscal consolidation measures are dampening the country's economic outlook. Sentiment barometers, as well as production data, are currently signaling a recession in 2013. A modest recovery is expected for 2014, nevertheless.

In Italy, economic output has been steadily declining since the third quarter of 2011 and it experienced a further pronounced drop in the first quarter of 2013. In addition to consolidation measures, political uncertainty is also likely to have dampened the economy. In view of this difficult situation, the Italian economy will not return to a positive – albeit only modest – growth path before 2014.

Spain was in recession in 2012 and is still suffering from a number of factors sapping domestic demand, in addition to the bleak international economic climate. The reduction of high levels of private debt accumulated in the wake

of the property bubble, necessary fiscal consolidation measures and the stringent lending policy of Spanish banks are having a negative impact on both short-term growth and medium-term growth prospects, as is particularly high (youth) unemployment. The recession is therefore expected to persist in 2013.

Greece was in deep recession for the fifth year in a row in 2012. Almost a quarter of its annual economic output has been lost since the start of the crisis in 2008. The adjustment process required is weighing heavily on the Greek economy. In addition to cuts in the wake of fiscal consolidation, the development of real household income was affected by falling wages and sharply rising unemployment. Youth unemployment has grown extraordinarily steeply in recent years. High levels of uncertainty and lending restrictions imply a further decline in investment.

Table 2

### Underlying Global Economic Conditions

	2012	2013	2014	2015
<b>Gross domestic product</b>				
<i>Annual change in % (real)</i>				
World GDP growth outside the euro area	+3.6	+3.6	+4.2	+4.4
U.S.A.	+2.2	+1.9	+2.6	+3.0
Japan	+2.0	+1.5	+1.4	+0.9
Asia excluding Japan	+5.9	+6.3	+6.9	+6.8
Latin America	+2.9	+3.2	+3.7	+3.8
United Kingdom	+0.3	+1.0	+1.8	+2.1
New EU Member States <sup>1</sup>	+1.1	+0.8	+2.2	+2.8
Switzerland	+1.0	+1.3	+1.6	+2.0
Euro area <sup>2</sup>	-0.5	-0.6	+1.1	x
<b>World trade (imports of goods and services)</b>				
World economy	+2.9	+3.1	+5.9	+6.8
Non-euro area countries	+4.2	+4.1	+6.5	+7.3
Real growth of euro area export markets	+3.6	+2.7	+5.6	+6.5
Real growth of Austrian export markets	+1.3	+1.6	+4.9	+5.8
<b>Prices</b>				
Oil price in USD/barrel (Brent)	112.0	105.5	100.0	96.2
Three-month interest rate in %	0.6	0.2	0.3	0.5
Long-term interest rate in %	2.4	1.8	2.1	2.4
USD/EUR exchange rate	1.28	1.31	1.31	1.31
Nominal effective exchange rate (euro area index)	98.91	99.92	100.57	100.57

Source: Eurosystem.

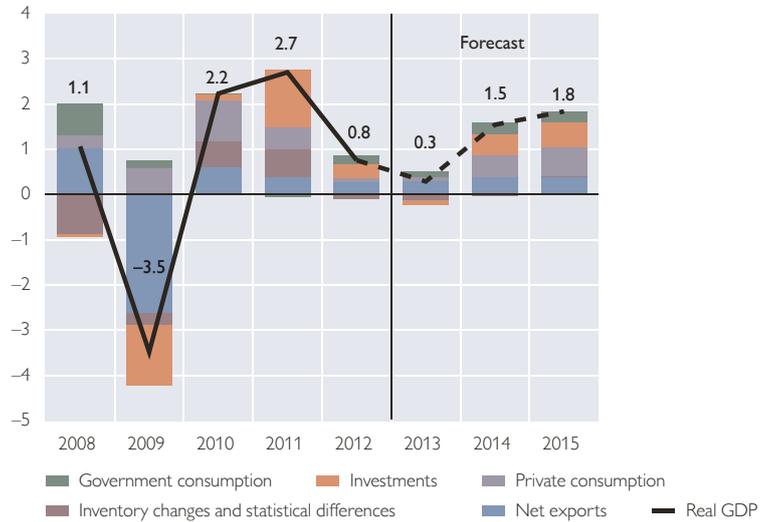
<sup>1</sup> Bulgaria, Czech Republic, Hungary, Latvia, Lithuania, Poland and Romania.

<sup>2</sup> 2013 to 2015: Results of the Eurosystem's June 2013 projections. The ECB publishes the projections as ranges based on historical forecast errors.

Chart 2

### Growth in 2014 and 2015 Driven by Domestic Demand and Net Exports

Real annual GDP growth and contributions to growth in percentage points



Source: Eurostat, OeNB.

This downward momentum is expected to lose steam by end-2013, however. Greek GDP will nevertheless shrink in 2013 and possibly continue to do so in 2014.

Portugal, like Greece, is struggling with adjustment problems, albeit comparatively smaller ones. 2012 saw the country in recession for the second year in a row. A ruling by Portugal's Constitutional Court struck down elements of the country's austerity package in spring 2013, which temporarily fanned even greater uncertainty. In view of further consolidation requirements, the recession is expected to persist in 2013 as well.

Ireland is likely to have the most painful adjustment measures behind it already: in 2012, the Irish economy registered growth for the second year in a row. Growth momentum is even expected to accelerate significantly by the end of the forecast horizon.

Cyprus applied for EU aid as early as summer 2012. Owing to the national elections in February 2013, however, it was not until end-March 2013 that there was political agreement at a European level about the size and form of the rescue package for Cyprus.

#### 4 Austria Can No Longer Avoid the Effects of the International Economic Downturn

In the wake of the economic crisis in Europe, Austrian GDP growth has stagnated since the second quarter of 2012. Sluggish export growth has not been sufficiently offset by domestic demand. This means the Austrian economy has been stagnating de facto for one year. Since the second quarter of 2012, quarterly growth has been fluctuating between +0.1% and -0.1%. Annual growth in 2012 nevertheless came to 0.8% thanks to still strong momentum at the start of year. From a demand-side

perspective, the first quarter of 2013 did not see any notable economic impetus from either domestic demand or net exports. Private consumption stagnated and gross fixed capital formation, which is sensitive to the economic cycle, shrank. By contrast, government consumption spending rose slightly. Export growth, which at least was still slightly positive (0.3%), seems to be primarily attributable to services exports. Goods exports have been stagnating since mid-2011. The OeNB projects very sluggish GDP growth of 0.3% for 2013 as a whole. In 2014 (1.5%) and 2015 (1.8%), GDP growth will be fueled by both domestic demand (all components) and net exports (see chart 2 and the remarks below).

#### 4.1 Austrian Exports Suffer from Slack European Demand

The dampening impact of Europe's sovereign debt crisis is reflected in domestic export growth, in particular. Real exports grew by only 1.4% in 2012. Export growth was fueled primarily by services exports, which have

proved to be relatively immune to the crisis. The breakdown of exports by region shows that demand from the euro area shrank in 2012. While both the intra- and extra-euro area exports of Austria developed along very similar lines in the crisis year of 2008/09 and in the subsequent upturn of 2010, intra-euro area exports have been stagnating since early 2011 and recently even declined. For 2014 and 2015, however, demand from the euro area for Austrian goods is expected to accelerate owing to the expected improvement in the economic situation.

In 2012, Austria gained minimal market shares owing to, inter alia, increased price competitiveness: the prices of Austrian exporters rose more slowly than those of their competitors in the international markets. For 2013, however, Austria is expected to win only a very small slice of the market. Over the remaining forecast period, however, the market shares won in 2012 and 2013 will shrink again primarily owing to a loss in price competitiveness with a lagged effect. The slump in com-

petitor prices is relatively sharp owing to the economic crisis.

On the strength of the current outlook, the OeNB expects export growth to have bottomed out in the fourth quarter of 2012. Exports should recover again, albeit at a slow pace. Still, for 2013 as a whole, the OeNB projects growth of only 1.7% (2012: 1.4%). Domestic export momentum is not expected to gain significant pace before end-2013 in tandem with the anticipated international recovery. In 2015, the international economy will have regained enough momentum to generate relatively robust export growth of 5.5%.

Import growth is largely determined by the development of exports and investment in equipment. In the light of sluggish export and investment growth, only very modest import growth of 1.3% is expected in 2013. Imports will continue to expand at a somewhat slower pace than exports over the remaining forecast period. As in 2011 and 2012, net exports will therefore make a positive contribution to GDP growth over the entire forecast period.

Table 3

### Growth and Price Developments in Austria's Foreign Trade

	2012	2013	2014	2015
<i>Annual change in %</i>				
<b>Exports</b>				
Competitor prices in Austria's export markets	+2.9	-0.3	+1.2	+1.5
Export deflator	+1.3	+0.8	+1.3	+1.6
Changes in price competitiveness	+1.5	-1.2	-0.1	-0.1
Import demand in Austria's export markets (real)	+1.3	+1.6	+4.9	+5.8
Austrian exports of goods and services (real)	+1.4	+1.7	+4.4	+5.5
Austrian market share	+0.2	+0.1	-0.4	-0.3
<b>Imports</b>				
International competitor prices in the Austrian market	+2.0	-0.1	+1.3	+1.6
Import deflator	+1.4	+0.6	+1.4	+1.5
Austrian imports of goods and services (real)	+1.1	+1.3	+4.2	+5.4
<b>Terms of trade</b>	-0.1	+0.2	-0.1	+0.1
<i>Percentage points of real GDP</i>				
<b>Contribution of net exports to GDP growth</b>	+0.3	+0.3	+0.4	+0.4

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook, Eurosystem.

Table 4

### Austria's Current Account

	2012	2013	2014	2015
	% of nominal GDP			
<b>Balance of trade</b>	2.5	2.8	2.8	3.0
Balance of goods	-2.2	-2.1	-2.1	-1.8
Balance of services	4.7	4.9	4.9	4.8
<b>Balance on income</b>	-0.1	0.2	0.3	0.4
<b>Balance on current transfers</b>	-0.6	-0.7	-0.6	-0.6
<b>Current account</b>	1.8	2.3	2.5	2.7

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

Owing to surpluses in trade in services, Austria has consistently recorded surpluses in the trade balance since 1998. Prior to the financial and economic crisis, even the traditionally negative balance of goods had at times moved into the black. However, the balance of goods suffered a significant and sustained deterioration owing to weak demand for goods exports in the wake of the crisis. By contrast, the services balance looks conspicuously immune to crisis and is following a steady uptrend. This is in part owed to the Austrian tourist sector's excellent growth.<sup>3</sup> The contribution of business-related services to the services balance (+EUR 7.8 billion) was even larger than that of tourism (+EUR 6.8 billion) in 2012. Overall, a current account surplus of 1.8% of GDP was generated in 2012. Furthermore, net external financial liabilities, which had historically accumulated, were completely settled for the first time in 2012. In other words, this means Austria has a small amount of net external assets (positive net external asset position) of EUR 1.5 billion. The anticipated pick-up in export activity will further strengthen the current account in con-

junction with the reduction of the deficit in the balance of goods.

#### 4.2 Investment will Contract in 2013

In 2011, real gross fixed capital formation – fueled primarily by investments of the automotive industry which were driven by the investment backlog following the crisis – generated growth of 6.3%, its highest level since 1988. In early 2012, however, investment momentum slowed significantly owing to the tough economic climate. Since the second quarter of 2012, investment activity has declined on a quarterly basis. In 2012 as a whole, however, gross fixed capital formation registered growth of 1.4%. The contraction of gross capital formation during 2012 was driven by particularly cyclically-sensitive investment in equipment. By contrast, housing investment registered positive, albeit extremely sluggish, growth. Gross fixed capital formation continued to contract in the first quarter of 2013.

This contraction was driven primarily by three factors: the European debt crisis, the accompanying recession in Austria's key sales countries and the resulting continued uncertainty about

<sup>3</sup> The best performance to date since records began was registered in the winter season of 2012/13 (November 2012 to April 2013). All current account data: preliminary OeNB calculations.

future sales opportunities. By contrast, both internal and external financing conditions developed extraordinarily favorably.<sup>4</sup> This situation suggests investment activity will bounce back quickly as the international economic environment improves. Average interest rates for corporate loans already fell markedly in 2012 and, at a nominal average of 2.1%, led to real interest rates around zero in the second half of 2012. In addition, major domestic companies can also finance themselves via securities issues, which accounted for 45% of total external financing in 2012. Austrian companies also have considerable funds for internal financing purposes. The corporate sector posted a financing surplus of EUR 0.5 billion in 2012 and has been a net provider of capital since 2009. According to financial asset statistics, deposits have reached nearly EUR 60 billion. Although banks have steadily slightly tightened their

credit standards for corporate loans since mid-2011, this behavior has so far been reflected primarily in lending conditions (interest margin, required collateral and additional/ancillary agreements) and not in the lending volumes. Growth in corporate lending slowed significantly during 2012, yet remained positive.

Despite continued favorable financing conditions in 2013, sluggish investment activity is likely to persist in the first half of 2013. The order books expanded toward the middle of the year. With the expected gradual improvement in external macroeconomic conditions, investment activity will also recover in the second half of 2013 and, especially, in 2014 and 2015. Owing to still below-average capacity utilization, gross fixed capital investment is expected to contract in 2013 as a whole (−0.5%). However, it will expand substantially again in 2014 (2.2%) and

Table 5

### Investment Activity in Austria

	2012	2013	2014	2015
<i>Annual change in %</i>				
Total gross fixed capital formation	+1.4	−0.5	+2.2	+2.7
<i>of which: Investment in plant and equipment</i>	+1.0	+0.1	+3.0	+3.4
Residential construction investment	+3.1	+0.4	+1.2	+1.1
Nonresidential construction investment and other investment	+1.1	−0.7	+1.8	+2.7
Government investment	+1.3	+3.9	+3.9	+3.9
Private investment	+1.4	−0.7	+2.1	+2.6
<i>Contribution to total gross fixed capital formation growth in percentage points</i>				
Investment in plant and equipment	+0.4	+0.1	+1.2	+1.4
Residential construction investment	+0.6	+0.1	+0.2	+0.2
Nonresidential construction investment and other investment	+0.4	−0.3	+0.7	+1.0
Government investment	+0.1	+0.2	+0.2	+0.2
Private investment	+1.4	−0.7	+2.0	+2.5
<i>Contribution to real GDP growth in percentage points</i>				
Inventory changes	−0.1	+0.0	+0.0	+0.0

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

<sup>4</sup> For a detailed overview of the financing situation, see Andreasch, M. 2013. Geldvermögensbildung und Finanzierung des privaten Sektors im Jahr 2012. In: Statistiken – Daten und Analysen Q2/13. OeNB. 30–38.

2015 (2.7%). While cyclically sensitive investment in equipment will stagnate in 2013, civil engineering will decline fairly sharply by comparison, owing to the small order book of quasi-public infrastructure companies. Following sharp slumps in previous years, government investment will grow by almost 4% per year over the forecast period. At around 5%, however, its share as a percentage of total investment is very small. In 2014, investment momentum will be fueled by investment in equipment and civil engineering. Housing approvals do not currently indicate any

appreciable increase in housing investment. Despite very low interest rates and rising house prices, housing investment momentum will remain fairly modest over the forecast period.

#### 4.3 Private Consumption Remains Sluggish

Payroll employment rose by 1.1% in 2012. Given the favorable employment situation by international comparison, the sluggish private consumption that has been observed for one year now is surprising. In real terms, private consumption grew by a mere 0.2% in 2012

Box 1

#### Development of Public Sector Finances from 2012 to 2015<sup>1</sup>

As in 2011, the general government budget deficit also stood at 2.5% of GDP in 2012. The extremely steep rise in capital transfers to banks (from 0.2% to 0.9% of GDP) and the relatively vigorous increase in social benefits were offset by subdued growth in other expenditure and by a good development receipts despite the sluggish economy. This robust growth in receipts was fueled by some smaller measures stipulated under the previous two consolidation packages and, particularly, by a sizeable increase in income from VAT and wage-related taxes arising from the high wage agreements and continued strong employment growth.

Further structural improvements in the budget balance are anticipated over the forecast period; this projection applies to the current year, in particular. In 2015, Austria should therefore be only some ½% of GDP off the target value of -0.45% of GDP for the structural budget balance. This phenomenon is attributable to two factors: first, consolidation measures implemented in 2012 such as wage freeze in large parts of the public sector, the indexation of pensions below the previous rate of inflation as well as various smaller measures on the revenue side and, second, the nominal fixing of both wage and income tax brackets (“bracket creep”).

However, the forecast of headline budget balance development is subject to considerable uncertainty. In addition to economic risks, key factors for this uncertainty are particularly the financial and statistical effects of potential financial stabilization measures (“bank bailout package”). The headline budget balance forecast presented in table 1 only includes the EUR 1.15 billion (~0.4% of GDP) already accounted for in the 2013 federal budget. The time<sup>2</sup> and amount of potential additional transfers to banks were still not assessable at the time of this publication’s editorial deadline.

The bailout programs for Spain and Cyprus are financed via the European Stability Mechanism (ESM). Austria’s payments into the ESM were already included in the OeNB December forecast of 2012. The impact of the management of the euro area crisis on Austria’s deficit and debt thus remains almost unchanged compared with the OeNB forecast of December 2012.

<sup>1</sup> Prepared by Lukas Reiss, Economic Analysis Division, lukas.reiss@oenb.at.

<sup>2</sup> The time of recording a transfer in the national accounts may differ from that of recording a transfer on bank balance sheets. The debtor warrant by KA Finanz AG, which was reflected in its balance sheet in 2009, was recorded in Austria’s federal budget deficit and debt only in 2010, while the measures implemented due to the Greek PSI (capital increase, shareholder contribution and guarantees), which were reflected on the balance sheet in 2011, were recorded only in 2012.

as a whole (2011: 0.9%).<sup>6</sup> On a quarterly basis, real private consumer spending has been stagnating for five quarters. If one looks at the fragile development of real disposable household income, which has barely risen since 2009, this situation is no longer surprising, however. Real disposable household income stagnated in 2009 and then declined in the subsequent two years. It did not return to growth until 2012 and then at a below-average rate of 0.7% (average growth from 2000 to 2011: 1.2%). This development was primarily attributable to sluggish real wage growth, which was negative in both 2010 and 2011 and only marginally positive in 2012 (0.2%).<sup>5</sup> Including so-called bracket creep, real wages per employee also fell in 2012.

Though inflation will ease in 2013, owing to the economic crisis, also all income components will grow more sluggishly than in 2012 (compensation, property income, mixed income and

operating surpluses).<sup>6</sup> In particular, investment income growth is projected to slow significantly owing to historically low interest rates. This means real disposable household income will also virtually stagnate in 2013 (0.2%). A return to growth in 2014 will almost wholly result from a drop in inflation and not from a rise in nominal income. Real disposable household income is not expected to approach historically average values again until 2015.

Given the expectation that real disposable household income will almost stagnate, growth in private real consumer spending is not projected to accelerate in 2013. Only once both real disposable household income and employment increase substantially will private consumption fuel GDP growth again in 2014 and 2015. Since the outbreak of the global financial and economic crisis, forms of income with a small marginal propensity to consume have become less important in relative

Table 6

### Determinants of Nominal Household Income in Austria

	2012	2013	2014	2015
<i>Annual change in %</i>				
Payroll employment	+1.2	+0.6	+0.4	+0.7
Wages per employee	+2.9	+2.4	+2.0	+2.3
Compensation of employees	+4.2	+3.0	+2.5	+3.0
Property income	+9.9	+1.7	+3.8	+3.9
Mixed income and operating surplus, net	+3.0	+2.1	+4.9	+4.8
<i>Contribution to disposable household income growth in percentage points</i>				
Compensation of employees	+3.5	+2.6	+2.1	+2.6
Investment income	+0.9	+0.2	+0.4	+0.4
Mixed income and operating surplus, net	+0.6	+0.4	+1.0	+1.0
Net transfers minus direct taxes <sup>1</sup>	-1.6	-0.8	-1.0	-0.8
Disposable household income (nominal)	+3.5	+2.4	+2.5	+3.1

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

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

<sup>5</sup> *Negative wage drift, which is derived from the differences between collective wage agreements and actually disbursed wages owing to shifts in employment to differently remunerated economic sectors, changes in the share of part-time employees, changes in overpayments and changes in overtime worked, is taken into consideration here. Negative wage drift occurs when growth in negotiated wages exceeds growth in actual wages.*

<sup>6</sup> *For the projected development in payroll income, see section 6.*

Table 7

### Private Consumption in Austria

	2012	2013	2014	2015
<i>Annual change in %</i>				
Disposable household income (nominal)	+3.5	+2.4	+2.5	+3.1
Private consumption expenditure (PCE) deflator	+2.9	+2.2	+1.6	+1.8
Disposable household income (real)	+0.7	+0.2	+0.9	+1.3
Private consumption (real)	+0.2	+0.2	+0.9	+1.2
<i>% of nominal disposable household income</i>				
Saving ratio	7.7	7.7	7.7	7.7

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

terms, especially property income. This situation led to a notable decrease in the saving ratio to 7.4% by 2011. In 2012, both investment income and the saving ratio (7.7%) were up once more. This increase is also likely to have been induced by higher precautionary saving. The saving ratio is expected to develop steadily for the period from 2013 to 2015.

### 5 Very Healthy Labor Market Situation Deteriorates Slightly

Robust employment growth, which had commenced with the liberalization of the labor market vis-à-vis Eastern European EU Member States (except for Bulgaria and Romania), continued

despite real GDP stagnating since spring 2012. Although employment growth increasingly lost steam compared with 2011, aggregate employment growth stood at a still healthy 1.1% (some +45,000 persons) in 2012 as a whole<sup>7</sup> and the number of payroll employees rose by 1.1% (some +44,000 persons). This development also continued in the first quarter of 2013. Companies are reacting to the economic slowdown primarily by laying off temporary workers, whose numbers have been steadily falling since April 2012. The number of jobless persons (+14,000) and persons currently undergoing occupational re-training (+3,400) increased in parallel with the rise in employment.

Table 8

### Labor Market Developments in Austria

	2012	2013	2014	2015
<i>Annual change in %</i>				
<b>Total employment</b>	+1.1	+0.5	+0.5	+0.7
of which: Payroll employment	+1.2	+0.6	+0.4	+0.7
Self-employment	+0.2	+0.1	+0.7	+1.0
Public sector employment	-0.2	-0.1	-0.1	-0.1
Registered unemployment	+6.8	+11.1	+3.3	-0.7
Labor supply	+1.4	+1.0	+0.6	+0.6
<i>% of labor supply</i>				
<b>Unemployment rate (Eurostat definition)</b>	4.4	4.8	4.9	4.9

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

<sup>7</sup> 2012 also saw a steep rise in the number of hours worked (+0.8%), which means employment growth is not only attributable to the increase in the number of part-time employees or to the reduction in overtime or time credits.

In the first few months of 2013, unemployment continued to grow, in part, for weather-related reasons. The number of vacancies reported fell, thereby signaling a further cooling on the labor market. At 4.4%, however, the Austrian unemployment rate (Eurostat definition) remained the lowest in the EU in 2012 – despite the 0.2 percentage point rise on the previous year.

Despite the still weak economy, further payroll employment growth, which will however be comparatively weak, is expected for 2013 (0.6%; +21,000 persons). In 2014, employment growth will be similarly subdued because of the economic development (0.4%; +16,000 persons). Somewhat more robust growth is not anticipated again before 2015 (0.7%; +25,000 persons).

Labor supply (the number of people in employment plus the registered unemployed) rose steeply in both 2011 and 2012 (+60,000 persons, respectively). A key factor behind this phenomenon was the complete opening up of the Austrian labor market in May 2011 to workers from the eight new EU Member States (EU-8).<sup>8</sup> From April 2011 to March 2013, labor supply from these countries increased by some 60,000 persons, with external labor supply expanding by a total of some 90,000.<sup>9</sup> The momentum of inward migration from these countries is expected to slow over the rest of the forecast period. On January 1, 2014, the Austrian labor market will be opened up to workers from Bulgaria and Romania. Since a daily commute from these two countries is not feasible and the currently much weaker economy is limiting demand for additional labor, labor supply growth expected from this liberalization measure is forecast to be lower

than that generated by workers coming from Austria's immediate Eastern neighbors. This forecast estimates the effects of the second labor market opening with labor supply growing by 10,000 persons (in 2014 and 2015). Altogether (EU-8 plus Bulgaria and Romania), the impact of labor market liberalization in 2014 and 2015 will be smaller than in 2011 and 2012. Labor supply will, additionally, be influenced by the growing labor force participation of more mature domestic workers over the forecast period.

As a result of the aforementioned developments in labor supply and demand, the unemployment rate will climb markedly to 4.8% (2013) and 4.9% (2014), at which level it will remain in 2015.

## 6 Inflation Eases Significantly

Austria's HICP inflation, which had peaked at 3.6% during 2011, eased to 2.6% in 2012 and stood most recently (April 2013) at 2.1%. This decline was primarily attributable to both the energy and food sector. All other HICP core components (services and industrial goods excluding energy) have also exhibited falling inflation rates since the end of 2012, although their influence on the way inflation developed was less pronounced.

The downtrend in HICP inflation evident since early 2013 will persist until year-end. This is primarily attributable to the still steadily tumbling crude oil prices as well as considerably slowing wage cost growth. In addition, GDP growth will develop below potential over the forecast period. Energy, services and food (among other sectors) are forecast to make smaller contributions to inflation in the next few years. HICP inflation is expected to ease to

<sup>8</sup> Slovenia, Slovakia, Poland, the Czech Republic, Hungary, Estonia, Latvia and Lithuania.

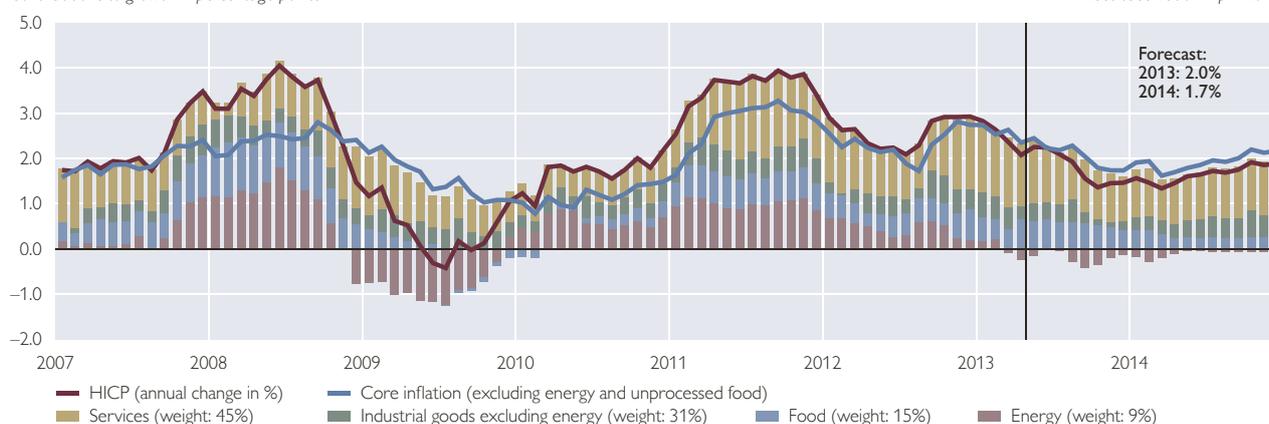
<sup>9</sup> Source: BALI database, not seasonally adjusted.

Chart 3

## HICP Inflation and Contributions of Subcomponents

Contributions to growth in percentage points

Last observation: April 2013



Source: OeNB (June 2013 NIPE), Statistics Austria.

2.0% in 2013 and to 1.7% in 2014 before slightly ticking up again to 1.8% in 2015 owing to the health of economy. Core inflation (excluding energy and unprocessed food) will drop from 2.2% (2013) to 1.9% (2014) and will exceed headline inflation. This phenomenon is attributable to (in the medium term) above-average inflation in the services

sector, which is currently largely unaffected by the crisis. The surge in prices in the services sector also explains the current difference vis-à-vis the development of inflation in Germany.

Wage agreements for 2013 indicate an average increase in collectively agreed private-sector wages of 3.0%, thus falling short of the level for 2012 (3.4%).

Table 9

## Selected Price and Cost Indicators for Austria

	2012	2013	2014	2015
Annual change in %				
Harmonised Index of Consumer Prices (HICP)	+2.6	+2.0	+1.7	+1.8
HICP energy	+5.1	-1.4	-1.2	-0.1
HICP excluding energy	+2.3	+2.4	+1.9	+2.0
Private consumption expenditure (PCE) deflator	+2.9	+2.2	+1.6	+1.8
Investment deflator	+1.8	+1.5	+1.2	+1.3
Import deflator	+1.4	+0.6	+1.4	+1.5
Export deflator	+1.3	+0.8	+1.3	+1.6
Terms of trade	-0.1	+0.2	-0.1	+0.1
GDP at factor cost deflator	+2.0	+0.8	+1.4	+1.6
Unit labor costs	+3.3	+2.7	+0.9	+1.2
Compensation per employee	+2.9	+2.4	+2.0	+2.3
Labor productivity	-0.3	-0.2	+1.1	+1.1
Collectively agreed wage settlements	+3.3	+2.6	+2.1	+2.3
Profit margins <sup>1</sup>	-1.3	-1.9	+0.4	+0.4

Source: 2011: Eurostat, Statistics Austria; 2013 to 2015: OeNB June 2013 outlook.

<sup>1</sup> GDP deflator divided by unit labor costs.

For the public sector, a wage freeze agreed under the consolidation package entered into force in 2013. For the economy as a whole, therefore, collectively agreed wages are assumed to rise by 2.6% in 2013. Since overpayments are dependent on the economy, they are forecast to decline in 2013, resulting in a negative wage drift of 0.3 percentage points. With a projected increase in compensation per employee by 2.4%, real wage growth will amount to 0.4%, resulting in a considerable narrowing of corporate profit margins. Owing to a downtick in inflation, aggregate wage settlements of only 2.1% are projected for 2014. Collectively agreed wages should rise again slightly in 2015. Growth in unit labor costs will decelerate markedly and fall short of the increase in the GDP deflator in 2014 and 2015, which means corporate profit margins will turn positive again. The output gap will remain negative over the entire forecast horizon, which means no price pressures should arise on the domestic production front.

## **7 Broadly Balanced Forecast Risks**

This forecast represents the most likely way, from a current perspective, the Austrian economy will develop in the period from 2013 to 2015. There are, however, a number of factors which represent upside and downside risks to the economy. As with the OeNB December 2012 outlook, the outlook for the euro area – and therefore also partly for the world economy – is based on a “muddling through” scenario. The sovereign debt crisis in the euro area is not expected to worsen or be quickly resolved in the short term. As with the OeNB December 2012 outlook, developments in the euro area still remain the most significant risk, however. Since July 2012 and, especially, since

the implementation of the OMT program, the markets hardly see any risk of a dramatic deterioration in the euro area situation anymore. As a result, the financial markets – especially, the sovereign bond markets – have stabilized considerably, and refinancing costs on the bond markets have fallen accordingly. Nonetheless, it cannot be ruled out that the European countries affected by the crisis are not implementing the necessary structural reforms and consolidation measures in their entirety or that extraordinarily high unemployment in many of the countries concerned will give rise to further problems. As a consequence renewed investor uncertainty could raise risk premiums again.

By contrast, speedier reform in the countries concerned may also bring about a faster-than-expected recovery. Apart from a number of potential geopolitical hotspots, the most significant external risk is currently posed by the U.S.A. Although the effects of the fiscal cliff are included in a good part of this forecast, fiscal contraction might also have larger negative repercussions on the U.S. economy.

Domestic demand in Austria also poses slight upside risks. Owing to the healthy corporate profit situation, investment growth may also prove faster and higher if sales expectations rise. This situation also poses an upside risk to employment. In addition, consumers, in response to easing inflation, could more strongly boost their private consumption growth by lowering the saving ratio.

The short to medium-term risks to inflation are balanced. The balanced risk to the global economy means a balanced risk to price development. Should geopolitical risks materialize, they might fuel inflation via higher commodity prices.

## 8 New External Assumptions since the December 2012 Outlook Tending to Curb Growth

The external economic environment has further deteriorated since the OeNB December 2012 outlook. The underlying assumptions on the growth of both Austrian export markets and world trade had to be significantly revised downward (2013: –1.1 percentage points, 2014: –1.0 percentage points). Although oil prices changed only slightly against December 2012, the ECB’s expansionary monetary policy resulted in lower long-term interest rates compared with December, which in turn had an energizing effect on the economy. Compared with OeNB December 2012 outlook, the underlying assumptions on exchange rate developments remained almost unchanged.

The effects of these new external assumptions were simulated using the OeNB macroeconomic model. Table 11

lists the reasons for revising the outlook in detail. Apart from the effects 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 2012) 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 2012 and the first quarter of 2013). The residual 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.

The downward revision for 2013 by 0.2 percentage points is explicable by new data, changed external assumptions and the short-term forecast. The carry-over effect is now slightly negative, and growth in the first quarter of 2013

Table 10

### Change in the External Economic Conditions since the OeNB December 2012 Outlook

	June 2013		December 2012		Difference	
	2013	2014	2013	2014	2013	2014
<i>Annual change in %</i>						
Growth of Austria's export markets	+1.6	+4.9	+2.7	+5.9	–1.1	–1.0
Competitor prices in Austria's export markets	–0.3	+1.2	+1.6	+1.5	–1.9	–0.3
Competitor prices in Austria's import markets	–0.1	+1.3	+1.4	+1.5	–1.5	–0.2
<i>USD per barrel (Brent)</i>						
Oil price	105.5	100.0	105.0	100.5	+0.5	–0.5
<i>Annual change in %</i>						
Nominal effective exchange rate (exports)	–0.9	+0.0	+0.3	+0.0	–1.2	+0.0
Nominal effective exchange rate (imports)	–0.5	+0.0	+0.2	+0.0	–0.7	+0.0
%						
Three-month interest rate	0.2	0.3	0.2	0.3	+0.0	+0.0
Long-term interest rate	1.8	2.1	2.1	2.5	–0.3	–0.4
<i>Annual change in %</i>						
U.S. GDP (real)	+1.9	+2.6	+1.9	+2.6	+0.0	+0.0
<i>USD/EUR</i>						
USD/EUR exchange rate	1.31	1.31	1.28	1.28	+0.03	+0.03

Source: Eurosystem.

is marginally weaker than had been expected in December 2012. From a purely technical perspective, the external assumptions alone would induce a downward revision by 0.3 percentage points. By contrast, the short-term forecast is almost unchanged, however. The downward revision of growth for 2014 by also 0.2 percentage points is

partly attributable to the more unfavorable external assumptions (–0.4 percentage points). The inflation outlook has deteriorated slightly despite the downward revision of the growth outlook. The upward revision for 2013 is explicable primarily by unexpectedly higher inflation in the services sector in early 2013.

Table 11

### Breakdown of Forecast Revisions

	GDP		HICP	
	2013	2014	2013	2014
<i>Annual change in %</i>				
June 2013 outlook	+0.3	+1.5	+2.0	+1.7
December 2012 outlook	+0.5	+1.7	+1.7	+1.6
Difference	–0.2	–0.2	+0.3	+0.1
<i>Percentage points</i>				
Due to:				
External assumptions	–0.3	–0.4	+0.0	+0.0
New data	–0.1	+0.0	+0.2	+0.0
of which: Revision of historical data until Q3 12	+0.0	+0.0	+0.0	+0.0
Projection errors for Q4 11 and Q1 13	–0.1	+0.0	+0.2	+0.0
Other <sup>1</sup>	+0.2	+0.2	+0.1	+0.1

Source: OeNB June 2013 and December 2012 outlooks.

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

## Annex: Detailed Result Tables

Table 12

### Demand Components (Real Prices)

Chained volume data (reference year = 2005)

	2012	2013	2014	2015	2012	2013	2014	2015
	EUR million				Annual change in %			
Private consumption	144,569	144,855	146,223	147,987	+0.2	+0.2	+0.9	+1.2
Government consumption	49,914	50,262	50,936	51,571	+1.0	+0.7	+1.3	+1.2
Gross fixed capital formation	56,804	56,530	57,755	59,296	+1.4	-0.5	+2.2	+2.7
of which: Investment in plant and equipment	23,201	23,232	23,924	24,730	+1.0	+0.1	+3.0	+3.4
Residential construction investment	11,447	11,493	11,625	11,759	+3.1	+0.4	+1.2	+1.1
Investment in other construction	22,138	21,976	22,378	22,978	+1.1	-0.7	+1.8	+2.7
Changes in inventories (including statistical discrepancy)	4,468	4,103	4,015	4,104	x	x	x	x
Domestic demand	255,754	255,747	258,925	262,955	+0.5	+0.0	+1.2	+1.6
Exports of goods and services	156,638	159,304	166,383	175,496	+1.4	+1.7	+4.4	+5.5
Imports of goods and services	140,690	142,577	148,633	156,698	+1.1	+1.3	+4.2	+5.4
Net exports	15,948	16,719	17,741	18,789	x	x	x	x
<b>Gross domestic product</b>	<b>271,702</b>	<b>272,482</b>	<b>276,682</b>	<b>281,760</b>	<b>+0.8</b>	<b>+0.3</b>	<b>+1.5</b>	<b>+1.8</b>

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

Table 13

### Demand Components (Current Prices)

	2012	2013	2014	2015	2012	2013	2014	2015
	EUR million				Annual change in %			
Private consumption	168,512	172,596	176,932	182,275	+3.1	+2.4	+2.5	+3.0
Government consumption	58,444	59,709	61,514	63,392	+3.7	+2.2	+3.0	+3.1
Gross fixed capital formation	66,340	66,985	69,267	72,008	+3.3	+1.0	+3.4	+4.0
Changes in inventories (including statistical discrepancy)	4,752	4,062	3,991	4,154	x	x	x	x
Domestic demand	298,048	303,353	311,704	321,829	+2.6	+1.8	+2.8	+3.2
Exports of goods and services	176,898	181,368	191,866	205,596	+2.8	+2.5	+5.8	+7.2
Imports of goods and services	165,916	169,091	178,750	191,347	+2.5	+1.9	+5.7	+7.0
Net exports	10,982	12,276	13,116	14,250	x	x	x	x
<b>Gross domestic product</b>	<b>309,030</b>	<b>315,629</b>	<b>324,820</b>	<b>336,078</b>	<b>+2.8</b>	<b>+2.1</b>	<b>+2.9</b>	<b>+3.5</b>

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

Table 14

## Deflators of Demand Components

	2012	2013	2014	2015	2012	2013	2014	2015
	2005 = 100				Annual change in %			
Private consumption	116.6	119.1	121.0	123.2	+2.9	+2.2	+1.6	+1.8
Government consumption	117.1	118.8	120.8	122.9	+2.7	+1.5	+1.7	+1.8
Gross fixed capital formation	116.8	118.5	119.9	121.4	+1.8	+1.5	+1.2	+1.3
Domestic demand (excluding changes in inventories)	116.7	118.9	120.7	122.7	+2.6	+1.9	+1.5	+1.7
Exports of goods and services	112.9	113.8	115.3	117.1	+1.3	+0.8	+1.3	+1.6
Imports of goods and services	117.9	118.6	120.3	122.1	+1.4	+0.6	+1.4	+1.5
Terms of trade	95.8	96.0	95.9	95.9	-0.1	+0.2	-0.1	+0.1
<b>Gross domestic product</b>	<b>113.7</b>	<b>115.8</b>	<b>117.4</b>	<b>119.3</b>	<b>+2.0</b>	<b>+1.8</b>	<b>+1.3</b>	<b>+1.6</b>

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

Table 15

## Labor Market

	2012	2013	2014	2015	2012	2013	2014	2015
	Thousands				Annual change in %			
Total employment	4,184.3	4,205.6	4,225.5	4,255.4	+1.1	+0.5	+0.5	+0.7
of which: Private sector employment	3,653.4	3,675.2	3,695.9	3,726.3	+1.3	+0.6	+0.6	+0.8
Payroll employment (national accounts definition)	3,635.5	3,656.1	3,672.3	3,696.8	+1.2	+0.6	+0.4	+0.7
	% of labor supply							
Unemployment rate (Eurostat definition)	4.4	4.8	4.9	4.9	x	x	x	x
	EUR per real output unit x 100							
Unit labor costs (whole economy) <sup>1</sup>	65.4	67.1	67.8	68.6	+3.3	+2.7	+0.9	+1.2
	EUR thousand per employee							
Labor productivity (whole economy) <sup>2</sup>	64.9	64.8	65.5	66.2	-0.3	-0.2	+1.1	+1.1
	EUR thousand							
Real compensation per employee <sup>3</sup>	36.4	36.5	36.7	36.9	+0.1	+0.2	+0.4	+0.5
	At current prices in EUR thousand							
Gross compensation per employee	42.5	43.5	44.4	45.4	+2.9	+2.4	+2.0	+2.3
	At current prices in EUR million							
Total gross compensation of employees	154,388	159,055	162,966	167,876	+4.2	+3.0	+2.5	+3.0

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

<sup>1</sup> Gross wages divided by real GDP.

<sup>2</sup> Real GDP divided by total employment.

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

Table 16

## Current Account

	2012	2013	2014	2015	2012	2013	2014	2015
	EUR million				% of nominal GDP			
<b>Balance of trade</b>	7,737.0	8,971.4	9,162.3	9,995.9	2.5	2.8	2.8	3.0
Balance of goods	-6,931.0	-6,550.5	-6,792.6	-6,148.9	-2.2	-2.1	-2.1	-1.8
Balance of services	14,668.0	15,521.9	15,954.8	16,144.8	4.7	4.9	4.9	4.8
<b>Balance on income</b>	-279.0	555.8	930.1	1,226.6	-0.1	0.2	0.3	0.4
<b>Balance on transfers</b>	-1,992.0	-2,136.1	-2,084.2	-2,128.1	-0.6	-0.7	-0.6	-0.6
<b>Current account</b>	5,466.0	7,391.1	8,008.2	9,094.4	1.8	2.3	2.5	2.7

Source: 2012: Eurostat; 2013 to 2015: OeNB June 2013 outlook.

Table 17

## Quarterly Outlook Results

	2013	2014	2015	2013				2014				2015			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Annual change in %</i>															
<b>Prices, wages and costs</b>															
HICP	+2.0	+1.7	+1.8	+2.6	+2.2	+1.9	+1.4	+1.5	+1.6	+1.7	+1.9	+1.7	+1.8	+1.8	+1.8
HICP (excluding energy)	+2.4	+1.9	+2.0	+2.8	+2.5	+2.3	+1.8	+1.8	+1.8	+2.0	+2.2	+1.9	+2.0	+2.0	+2.0
Private consumption expenditure (PCE) deflator	+2.2	+1.6	+1.8	+2.8	+2.4	+2.0	+1.7	+1.4	+1.5	+1.6	+1.7	+1.7	+1.8	+1.8	+1.9
Gross fixed capital formation deflator	+1.5	+1.2	+1.3	+1.7	+1.5	+1.4	+1.3	+1.2	+1.2	+1.2	+1.2	+1.2	+1.2	+1.3	+1.3
GDP deflator	+1.8	+1.3	+1.6	+2.8	+1.8	+1.6	+1.1	+0.6	+1.5	+1.6	+1.6	+1.6	+1.6	+1.6	+1.6
Unit labor costs	+2.7	+0.9	+1.2	+3.7	+3.0	+2.4	+1.7	+0.8	+0.9	+1.0	+1.0	+1.1	+1.2	+1.2	+1.3
Nominal wages per employee	+2.4	+2.0	+2.3	+2.9	+2.5	+2.3	+2.1	+1.9	+2.0	+2.1	+2.1	+2.2	+2.3	+2.4	+2.4
Productivity	-0.2	+1.1	+1.1	-0.7	-0.4	-0.1	+0.4	+1.1	+1.0	+1.1	+1.1	+1.1	+1.1	+1.1	+1.1
Real wages per employee	+0.2	+0.4	+0.5	+0.2	+0.1	+0.2	+0.4	+0.4	+0.5	+0.5	+0.4	+0.5	+0.5	+0.5	+0.5
Import deflator	+0.6	+1.4	+1.5	-0.2	+0.5	+0.7	+1.2	+1.8	+1.2	+1.2	+1.3	+1.4	+1.5	+1.6	+1.6
Export deflator	+0.8	+1.3	+1.6	+0.8	+0.8	+0.8	+0.9	+1.1	+1.3	+1.4	+1.4	+1.5	+1.6	+1.6	+1.7
Terms of trade	+0.2	-0.1	+0.1	+1.0	+0.2	+0.1	-0.3	-0.7	+0.1	+0.1	+0.1	+0.1	+0.1	+0.0	+0.0
<i>Annual and/or quarterly changes in % (real)</i>															
<b>Economic activity</b>															
GDP	+0.3	+1.5	+1.8	+0.0	+0.2	+0.3	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.5	+0.5	+0.5
Private consumption	+0.2	+0.9	+1.2	+0.0	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Government consumption	+0.7	+1.3	+1.2	+0.5	-0.1	+0.0	+0.1	+0.5	+0.5	+0.5	+0.4	+0.2	+0.2	+0.2	+0.2
Gross fixed capital formation	-0.5	+2.2	+2.7	-0.5	+0.0	+0.5	+0.7	+0.6	+0.5	+0.5	+0.6	+0.6	+0.7	+0.8	+0.8
Exports	+1.7	+4.4	+5.5	+0.3	+0.5	+0.8	+1.1	+1.2	+1.3	+1.3	+1.3	+1.3	+1.4	+1.5	+1.5
Imports	+1.3	+4.2	+5.4	+0.3	+0.3	+0.8	+1.0	+1.1	+1.2	+1.3	+1.3	+1.3	+1.3	+1.5	+1.5
<i>Contribution to real GDP growth in percentage points</i>															
Domestic demand	+0.1	+1.2	+1.4	+0.0	+0.1	+0.2	+0.3	+0.3	+0.3	+0.3	+0.4	+0.3	+0.3	+0.4	+0.4
Net exports	+0.3	+0.4	+0.4	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Changes in inventories	-0.1	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
<i>% of labor supply</i>															
<b>Labor market</b>															
Unemployment rate (Eurostat definition)	4.8	4.9	4.9	4.8	4.8	4.9	4.9	5.0	5.0	5.0	4.9	4.9	4.9	4.9	4.8
<i>Annual and/or quarterly changes in %</i>															
Total employment	+0.5	+0.5	+0.7	+0.3	-0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2
of which: Private sector employment	+0.6	+0.6	+0.8	+0.4	-0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3
Payroll employment	+0.6	+0.4	+0.7	+0.3	-0.2	+0.1	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2
<i>Annual and/or quarterly changes in % (real)</i>															
<b>Additional variables</b>															
Real disposable household income	+0.2	+0.9	+1.3	-0.2	+0.0	+0.5	+0.4	+0.2	+0.1	+0.0	+0.0	+0.4	+0.5	+0.6	+0.6
<i>% of real GDP</i>															
Output gap	-1.4	-1.3	-1.1	-1.5	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.2	-1.2	-1.1	-1.1	-1.0

Source: OeNB June 2013 outlook (based on seasonally and working-day adjusted data).

Table 18

### Comparison of Current Economic Forecasts for Austria

Indicator	OeNB			WIFO		IAS		OECD		IMF		European Commission	
	June 2013			March 2013		March 2013		May 2013		April 2013		May 2013	
	2013	2014	2015	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
<b>Key results</b>	<i>Annual change in %</i>												
GDP (real)	+0.3	+1.5	+1.8	+1.0	+1.8	+0.8	+1.8	+0.5	+1.7	+0.8	+1.6	+0.6	+1.8
Private consumption (real)	+0.2	+0.9	+1.2	+0.6	+0.9	+0.5	+1.1	+0.1	+0.8	x	x	+0.4	+1.0
Government consumption (real)	+0.7	+1.3	+1.2	+0.7	+1.0	+0.3	+0.3	+0.4	+0.1	x	x	+0.8	+1.0
Gross fixed capital formation (real)	-0.5	+2.2	+2.7	+1.5	+2.0	+1.0	+2.5	+0.6	+2.8	x	x	+1.1	+2.5
Exports (real)	+1.7	+4.4	+5.5	+3.3	+5.8	+2.6	+6.2	+2.1	+5.9	+2.7	+4.7	+2.8	+5.6
Imports (real)	+1.3	+4.2	+5.4	+3.6	+5.4	+2.2	+6.0	+1.5	+5.1	+2.8	+5.0	+2.2	+5.4
GDP per employee	-0.2	+1.1	+1.1	+0.1	+0.7	+0.3	+0.9	x	x	x	x	-0.1	+0.8
GDP deflator	+1.8	+1.3	+1.6	+2.0	+1.8	+1.8	+1.8	+1.5	+1.3	x	x	+2.0	+1.7
CPI	x	x	x	+2.2	+2.0	+2.1	+1.9	x	x	x	x	x	x
HICP	+2.0	+1.7	+1.8	+2.3	+2.0	x	x	+2.0	+1.5	+2.2	+1.9	+2.0	+1.8
Unit labor costs	+2.7	+0.9	+1.2	+2.2	+1.8	x	x	x	x	x	x	+2.2	+1.1
Payroll employment	+0.5	+0.5	+0.7	+0.7	+0.9	+0.5	+0.9	x	x	+0.4	+0.6	+0.7	+1.0
	<i>% of labor supply</i>												
Unemployment rate (Eurostat definition)	4.8	4.9	4.9	4.8	4.8	4.7	4.6	4.7	4.7	4.6	4.5	4.7	4.7
	<i>% of nominal GDP</i>												
Current account	2.3	2.5	2.7	2.6	2.9	x	x	2.4	2.9	2.2	2.3	3.1	3.2
Budget balance (Maastricht definition)	-1.7	-1.4	-1.2	-2.6	-2.0	-2.5	-1.5	-2.3	-1.7	-2.2	-1.5	-2.2	-1.8
<b>External assumptions</b>													
Oil price in USD/barrel (Brent)	105.5	100.0	96.2	105.0	108.0	112.0	117.0	100.0	105.0	102.6	97.6	104.9	99.2
Short-term interest rate in %	0.2	0.3	0.5	0.4	0.7	0.3	0.5	0.1	0.0	0.2	0.4	0.2	0.3
USD/EUR exchange rate	1.31	1.31	1.31	1.30	1.30	1.30	1.29	1.32	1.32	1.33	1.32	1.31	1.31
	<i>Annual change in %</i>												
Euro area GDP (real)	-0.6	+1.1	x	+0.0	+1.4	-0.3	+1.4	-0.6	+1.1	-0.3	+1.1	-0.4	+1.2
U.S. GDP (real)	+1.9	+2.6	+3.0	+1.8	+2.4	+2.0	+2.5	+1.9	+2.8	+1.9	+3.0	+1.9	+2.6
World GDP (real)	+3.0	+3.8	+4.0	+3.3	+4.0	x	x	+3.1	+4.0	+3.3	+4.0	+3.1	+3.8
World trade	+3.1	+5.9	+6.8	+3.8	+6.0	+3.8	+6.8	+3.6	+5.8	+3.6	+5.3	+3.2	+5.8

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

# Cross-Country Comparability of the Eurosystem Household Finance and Consumption Survey

The ECB recently published the first results of the euro area Household Finance and Consumption Survey (HFCS) and a report on the methodologies applied (ECB, 2013a and 2013b). The fact that the HFCS results vary considerably across the euro area gives rise to questions regarding their comparability. We question the focus on mean and median country rankings and argue for comparisons along the full unconditional net wealth distributions. Such analyses reveal large within-country variation as well as remarkable similarities between countries with regard to the distributions of net wealth. We discuss the relevance of household size and homeownership in this context and point out important caveats with regard to the interpretation of results. In the appendix we summarize relevant methodological differences which need to be taken into account in case of cross-country comparisons.

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JEL classification: D12, D14, D31

Keywords: net wealth, HFCS, inequality, distribution, data comparability, survey data

## 1 Introduction

The purpose of this article is twofold. First, we highlight the major challenges of interpretation that arise when the Eurosystem Household Finance and Consumption Survey (HFCS) is used for cross-country comparisons. Second, we wish to increase the awareness of researchers who will work with HFCS data about the influence of survey methodology on the outcome of statistical analysis (see appendix). Even though the specific characteristics of the data were addressed in detail in the publications of the Eurosystem Household Finance and Consumption Network (ECB, 2013a and 2013b), the ensuing scientific and public discussion has shown that a follow-up discussion of some points might facilitate a better understanding of the particulars of the HFCS dataset.

The goal of surveys is to gather information on a predefined topic from predefined units of observation. These units will differ from each other to some extent (for instance with regard to household composition) but a survey cannot

be expected to be designed to account for those differences *ex ante*. What is important, though, especially in the case of a multi-country survey project like the HFCS, is to harmonize the methodology to the highest degree possible.

A lack of harmonization is the key drawback of the Luxembourg Wealth Study (LWS), which used to be the only source of data available for international wealth comparisons (Sierminska et al., 2006). There, the different national surveys are based on different definitions of wealth, and the methodology for collecting and processing the data was not harmonized.

In contrast, the HFCS uses common concepts for a large number of variables surveyed, such as wealth, income and consumption. Because of the large number of detailed items, researchers are in the position to construct their own wealth definition (see [www.ecb.int/home/html/researcher\\_hfcn.en.html](http://www.ecb.int/home/html/researcher_hfcn.en.html) and [www.hfcs.at](http://www.hfcs.at)). Furthermore, the definition of the research unit, namely the household, was agreed *ex ante*, and the methodology with re-

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gard to the process of data production was harmonized extensively up front (ECB, 2013b).

The HFCS provides harmonized information on the balance sheets of more than 62,000 households in 15 euro area countries (all but Ireland and Estonia). The insights established into household resources and behavior allow for a better understanding of the monetary transmission mechanisms and of risks for financial stability.

Earlier studies have generated some key facts about the distribution of wealth in general (among them Kennickell, 2012; Wolff, 2012; Cowell et al., 2012; Davies and Shorrocks, 2000): Net wealth is very concentrated and distributed much more unequally than income. The bottom 50% in the wealth distribution of households holds only a tiny fraction of the aggregate wealth. Non-financial assets outweigh financial assets and consist mainly of households' main residences.

Household wealth was lower during the period from the 1950s to the 1970s than in later decades, reflecting among other things recovery from real and nominal wealth destruction during and after World War II. Piketty and Saez (2012) also mention anti-private capital policies including rent control, financial repression and nationalization policies. Politics were reversed in the 1980s and 1990s via globalization, deregulation and "large wealth transfers from public to private hands through cheap privatization." Thus the rise of private wealth is partly due to a decline of government wealth.

This article is structured as follows. The main part of the article is section 2, where we analyze the net wealth distributions across countries. Section 3 concludes the article by stressing the importance of careful collection of primary data as well as transparency

with regard to the data production process and argues in favor of cautious data analyses. In the appendix we sum up the methodological differences which might be especially important with regard to cross-country comparison.

## 2 Cross-Country Net Wealth Comparison

A comparison of the absolute net wealth figures in different percentiles in different countries of the euro area shows a lot of dispersion (see table 1). Some countries have rather low medians but comparatively high wealth values at the right tail of the distribution. This may lead to questionable debates as to which countries are richer and which countries are poorer in the euro area.

Table 2 shows the Gini coefficients and the shares in overall household net wealth held by the lower 50%, the top 10% as well as the top 5% of households. Whereas differences in these measures between countries should be interpreted with great caution, as we will discuss, the rather strong inequality of net wealth – compared to the distribution of income – in all countries is clearly visible. The stylized fact that households in the lower half of the distribution hold only a tiny fraction of aggregate wealth, while the share of households at the top is rather large, is confirmed for all countries.

### 2.1 Where in the Euro Area Are Households Wealthiest?

An overall picture of wealth distribution in the euro area has to combine two aspects: wealth distribution within each individual country and across countries. A key result of the HFCS is that households' wealth positions are very heterogeneous across countries, but even more so within countries. As opposed to the world income distribution, where those at the top of the

Table 1

**Selected Net Wealth Percentiles**

	EA	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
<i>EUR thousand</i>																
P1	-21.2	-38.0	-4.0	-29.7	-20.6	-27.7	-45.6	-10.6	-7.6	-2.0	-24.2	0.0	-163.1	-7.3	-7.3	-0.3
P5	0.0	-0.2	0.3	0.0	-1.6	0.2	-8.4	0.4	0.0	1.0	0.1	4.0	-34.6	0.1	0.3	1.5
P10	1.2	1.0	2.8	7.3	0.1	5.7	-0.6	1.6	2.0	5.0	5.0	16.1	-3.8	1.0	4.2	12.9
P20	8.0	6.1	18.0	59.4	3.5	55.4	2.9	5.7	15.0	18.0	34.7	63.0	7.1	8.8	28.1	30.2
P30	27.0	15.0	80.6	126.5	11.6	100.2	14.0	17.7	48.7	57.5	119.3	113.5	26.0	30.7	54.4	40.4
P40	61.8	34.7	149.6	189.1	27.8	140.8	46.2	53.4	73.8	116.3	269.2	165.3	62.4	52.2	71.8	50.8
P50	109.2	76.4	206.2	266.9	51.4	182.7	85.8	115.8	101.9	173.5	397.8	215.9	103.6	75.2	100.7	61.2
P60	167.4	139.6	274.1	357.7	97.2	228.2	130.1	174.8	129.8	221.4	502.2	267.7	155.5	100.3	136.4	72.4
P70	230.5	208.4	359.4	509.8	163.5	289.2	181.9	237.2	166.3	283.0	637.5	338.2	219.9	135.0	177.8	86.1
P80	320.6	310.8	483.6	768.6	261.1	387.4	262.9	328.8	220.4	375.5	889.7	452.8	304.0	188.1	237.5	108.0
P90	506.2	542.2	705.1	1,469.9	442.3	607.7	397.3	511.6	331.8	577.1	1,375.4	693.1	427.6	297.2	317.2	151.9
P95	762.1	934.6	1,073.4	2,411.9	661.2	878.5	553.6	775.4	469.3	855.0	2,023.9	1,049.4	581.2	482.4	434.5	207.4
P99	1,885.5	3,239.6	2,861.9	7,327.6	1,929.3	1,857.4	1,090.5	1,782.1	909.1	2,139.0	6,027.4	1,868.1	1,042.1	1,243.1	878.8	448.2

Source: Eurosystem HFCS 2010.

Note: In the following, EA will be used to denote "euro area (excluding Ireland and Estonia)".

Table 2

**Net Wealth Distribution – Inequality**

	Gini coefficient	Share of the lower 50%	Share of the top 10%	Share of the top 5%
%				
EA	0.68	6.0	50.4	37.2
AT	0.76	2.8	61.1	47.6
BE	0.61	10.1	44.0	31.3
CY	0.70	7.4	56.7	42.5
DE	0.76	2.8	59.2	45.6
ES	0.58	13.0	43.4	30.9
FI	0.66	5.2	45.0	30.6
FR	0.68	5.4	50.0	36.5
GR	0.56	12.4	38.8	25.4
IT	0.61	10.2	44.8	32.1
LU	0.66	8.6	51.3	39.9
MT	0.60	12.5	46.8	35.3
NL	0.65	4.9	40.1	25.7
PT	0.67	8.3	52.7	40.7
SI	0.53	13.8	35.7	22.4
SK	0.45	20.6	32.8	21.8

Source: Eurosystem HFCS 2010.

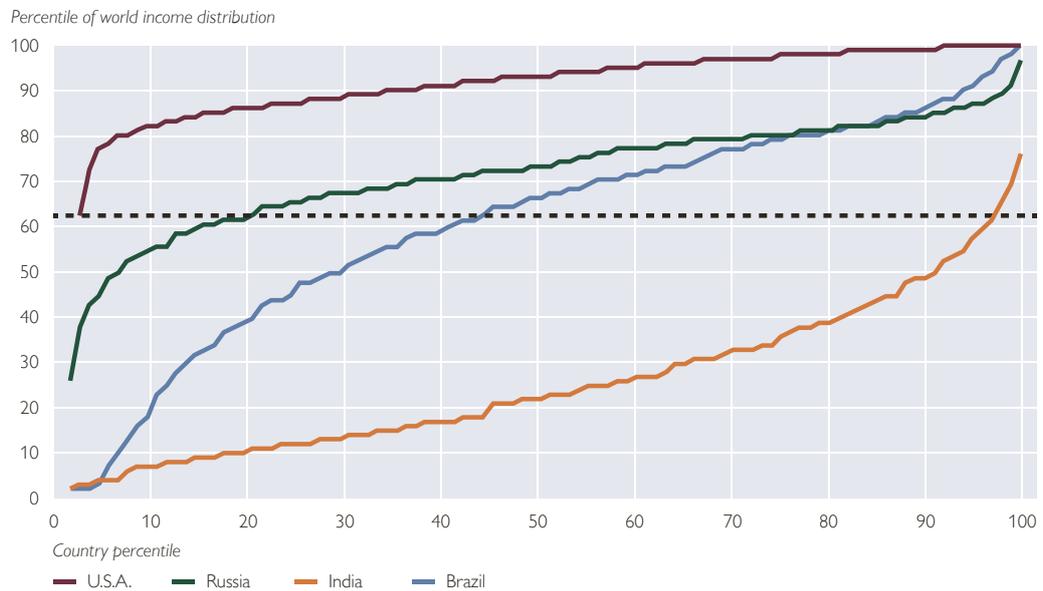
income distribution in one country can be at the very bottom of the income distribution in another country, in the euro area's wealth distribution, households from all countries can be found in all net wealth deciles of the euro area. With regard to income distribution, almost all people that live in a richer

country are better off than most people that live in a poorer country. This is illustrated by chart 1 if we compare the United States and India. The conclusion is that there is only a tiny overlap between rich and poor countries. Relatively rich people in India are comparable to the poorest people in the United States in terms of income. In the context of income it makes sense to talk about poor and rich countries. Accordingly, Branko Milanovic (2011) concludes that it is extremely important where you are born. The place of birth determines more than 60% of variability of global income.

Chart 2 shows the composition of euro area net wealth deciles by countries. To visualize also the shares of smaller countries (which may be proportional with those of other countries or disproportionately high or low) the individual countries have been re-weighted to equal size. This means that each country would have a 1/15<sup>th</sup> share in every decile (as there are 15 countries participating in the first wave of the HFCS) if net wealth was distributed equally across countries.

Chart 1

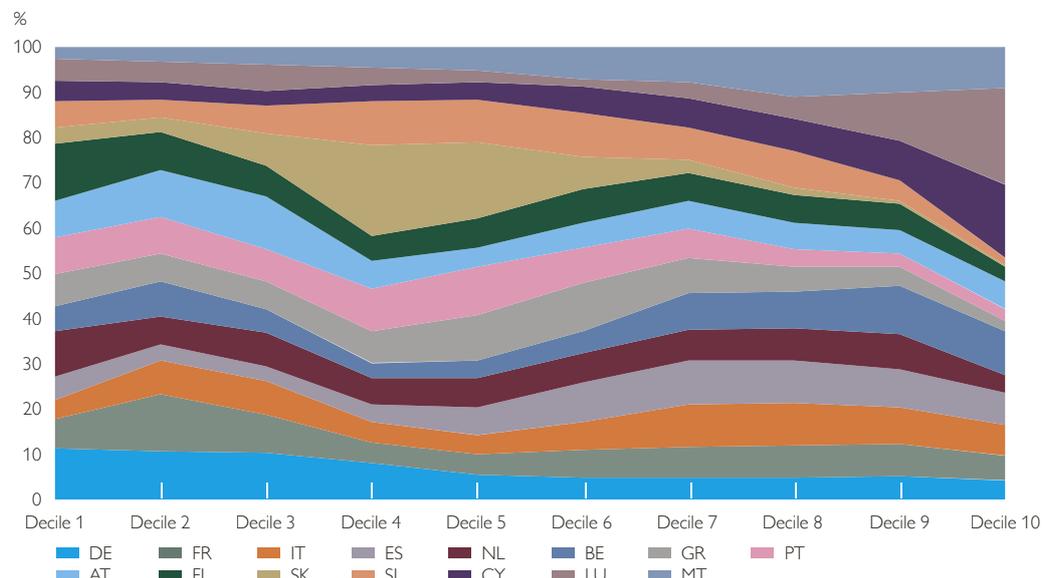
### Income Inequality as Illustrated by Selected Countries



Source: Milanovic (2011).

Chart 2

### Composition of Euro Area Net Wealth Deciles by Countries



Source: OeNB.

Note: Countries have been reweighted to equal size: They would each have a 1/15<sup>th</sup> share (=6.7%) in every decile (i.e. all lines would be straight) if net wealth was distributed equally across the individual euro area countries.

However, we find the euro area distribution to contain a disproportionately large number of households from Luxembourg and Cyprus at the top,

and a disproportionately large number of households from Slovakia in the middle. However, all countries have a share in all deciles of the euro area, and the

share of most countries is surprisingly close to their proportional population share (1/15<sup>th</sup>). In other words, the wealthy households are spread over all countries in the euro area in a rather stable pattern.

The absolute and relative wealth differences between households within each country are found to be very pronounced in all euro area countries. The patterns of these differences are remarkably stable in absolute as well as in relative terms. In all euro area countries a small fraction of the population holds a large share of wealth whereas the bottom half holds only a tiny share of total wealth.

## 2.2 Are Households Who Own Their Homes Wealthier Than Others?

In some countries households might have benefited from house price increases since they bought or inherited real estate. They might have used their savings to pay back a mortgage. They might have left their parents' home rather late in order to build up sufficient financial assets to buy a home of their own because the rental market is small and/or no social housing is available. This last consideration might also affect the household structure and in turn the distribution of wealth among households only because of their size and age composition.

These possible channels show how homeownership is interwoven with observed differences in wealth. But we should be careful with hasty conclusions. Homeownership patterns are highly mixed across and within countries in the euro area. The lowest ownership rate with regard to households' main residence can be found in Germany (44.2%), closely followed by Austria (47.7%). Slovakia, on the contrary, has an ownership rate of 89.9%, followed by Spain with 82.7%. In the

case of Austria, however, the homeownership rate of 47.7% masks a rate of 19.8% for Vienna and of 56.2% for the rest of Austria excluding Vienna, and even 74.6% for one province (Burgenland). Thus, the relative and even absolute differences in homeownership rates among the Austrian provinces alone exceed the differences across HFCS euro area countries.

Furthermore, as the homeownership rate of urbanized Luxembourg (67.1%) underlines, the homeownership pattern is obviously not a question of urban regions versus the countryside. Some of the differences between countries can also be explained by policy decisions. To give two examples: After the German reunification most people became tenants of their formerly state-owned main residences. Ownership stayed with the state or was privatized on larger scales. In Slovakia, in contrast, most people became owners of their main residences after the establishment of the Slovak Republic.

Table 3

### Median Net Wealth by Ownership of Household Main Residence

	Owners of household main residence	Nonowners of household main residence	Median net wealth
	<i>EUR thousand</i>		
EA	217.6	9.1	109.2
AT	241.2	11.6	76.4
BE	304.1	7.6	206.2
CY	349.0	16.3	266.9
DE	215.5	10.3	51.4
ES	214.3	5.1	182.7
FI	153.1	2.8	85.8
FR	238.4	7.8	115.8
GR	136.5	5.4	101.9
IT	250.8	10.8	173.5
LU	556.2	22.1	397.8
MT	267.0	21.7	215.9
NL	214.8	19.3	103.6
PT	106.1	4.5	75.2
SI	134.0	3.5	100.7
SK	65.6	2.2	61.2

Source: Eurosystem HFCS 2010 (ECB Statistical Tables).

Understanding the different patterns of homeownership across countries but also within countries might help to understand some of the differences in wealth we observe. In any case arguing that homeownership is the main driver of cross-country difference is a strong oversimplification. The country differences are the result of complex processes that have to be analyzed further in research.

### **2.3 Medians and Means: Which Indicator for Country Comparisons?**

The median is a statistically robust measure and the mean is not, given that just a few observations can cause it to change a lot. In general, the mean very likely reflects the situation of no observed household at all but will, in the case of net wealth, lie closer to some households in the upper part of the distributions. The median reflects the wealth position of exactly one household and splits the middle between those households that are wealthier and those that are less wealthy.

At a first glance the median appears to be the obvious choice because it is useful for avoiding the large influence of outliers that would distort the indicator. Yet, in some countries, the median of net wealth represents a household that owns a home and in others the median will represent a tenant household. In other words, in some countries the distribution around the median might be much more equal than in others. What is even more important for cross-country comparisons, though, is that neither the median nor the mean includes any information on the distribution. In other words, both measures mask heterogeneity within countries while focusing on differences at certain points of the distributions rather than on the variation

between the countries' overall distributions.

We suggest looking at the full distributions to observe cross-country differences as well as the full range of heterogeneity within countries. When we compare the full distributions across countries, we see a large amount of overlap between countries. In chart 3a we plot 21 percentiles (19 ventiles, P5–P95, as well as P1 and P99) of the net wealth distributions of Austria as well as Cyprus, Germany, Greece and Luxembourg, because those countries were the ones that got the biggest media attention in the “poor Germans – rich southern countries” debate. Similar charts including all other HFCS countries can be found in the appendix.

As a unit of measurement we use the euro area HFCS net wealth percentiles P1 to P99. The euro area percentiles form the 45 degree line. Reading the chart is straightforward: For example, Luxembourg's net wealth distribution always lies above the euro area distribution, implying that all Luxembourg households with more net wealth than the bottom 20% of all Luxembourg households always have a higher net wealth than their euro area counterparts. At the same time, for example about 45% of the Greek or Austrian households which – at this point – lie below the euro area line (go straight to the right from where the Luxembourg line crosses the 50<sup>th</sup> euro area percentile) have more wealth than 30% of all Luxembourg households (the point on the x-axis where the Luxembourg line crosses the 50<sup>th</sup> euro area percentile).

The dispersion of wealth is enormous in all countries. The 95<sup>th</sup> percentile of all countries lies at least above the 85<sup>th</sup> percentile of the euro area, and at the same time the 5<sup>th</sup> percentile of all countries lies at least

Chart 3

below the 10<sup>th</sup> percentile of the euro area. The chart also allows an interpretation in absolute terms. For example at least the bottom 10% of households (in Cyprus) or at most the bottom 25% (in Germany) has less than EUR 8,000 in net wealth (20<sup>th</sup> euro area percentile). Furthermore the local slope of the country distribution lines is also a measure of local inequality with regard to the euro area as a whole (45 degree line) or other countries and in that sense also says something about robustness when comparing certain percentiles such as the median between countries. For example the Austrian distribution is relatively steep around the median. It rises from being below the 35<sup>th</sup> euro area percentile at the Austrian 40<sup>th</sup> percentile to exceed the 55<sup>th</sup> euro area percentile at the Austrian 60<sup>th</sup> percentile. Over the same distance (40<sup>th</sup>–60<sup>th</sup> percentile), the Greek distribution ranges only from below the 45<sup>th</sup> to below the 55<sup>th</sup> euro area percentile.

Neither a mean, nor a median or a Gini coefficient nor any other type of function mapping the wealth distribution into a single number can substitute for a thorough examination of the full distribution of net wealth. In the case of the euro area, the distributions of net wealth largely overlap for all countries and change their shape along the way from the bottom to the top (see appendix). A ranking of HFCS countries in terms of household wealth would be misleading. This is why only an in-depth analysis of the complete distribution of wealth will produce meaningful results.

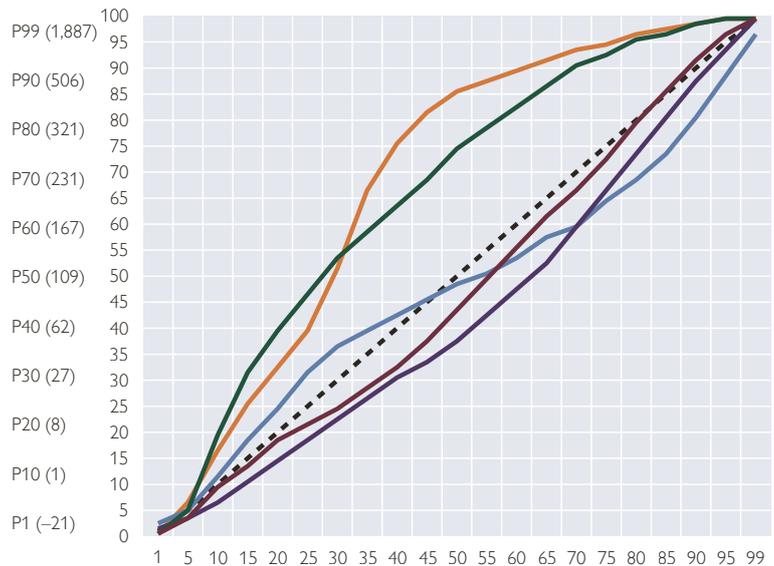
## 2.4 Household Structure

The HFCS was designed with the household as the unit of observation. It is mostly for practical reasons that most wealth items are not gathered at the personal level. Some parts of house-

## Net Wealth Distribution in Europe – Results for Austria, Cyprus, Germany, Greece and Luxembourg

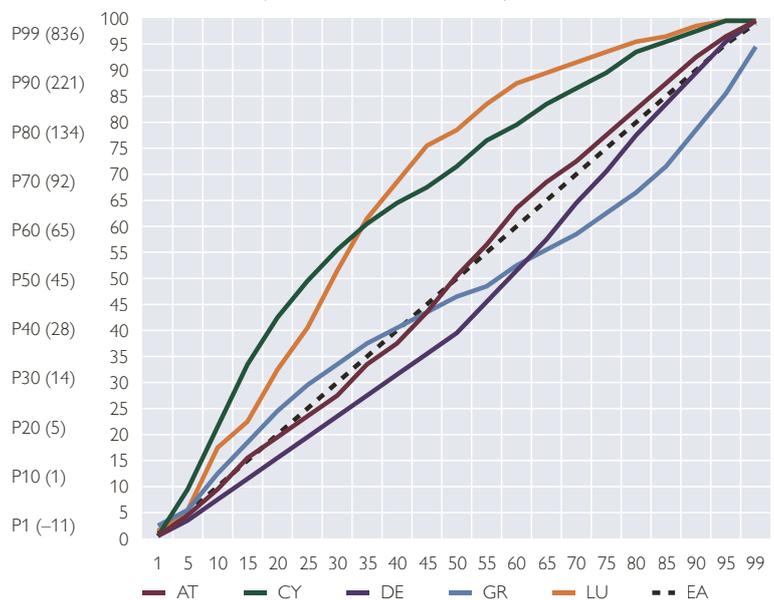
### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

holds' differences in wealth simply reflect a different size and different compositions of households. A household with three persons is, after all,

more likely to have greater wealth than a one-person household.

What is particularly important for cross-country comparisons is that household size is not distributed randomly across countries. In the HFCS country dataset these differences among countries are very pronounced. While in Germany, Austria and Finland close to 40% of all households are one-person households (see ECB, 2013a), this share is below 20% in Spain, Malta and Portugal. Furthermore, within countries variation is also high. In Austria the share of one-person households is higher than 50% for Vienna and about 30% in Upper Austria and Carinthia.

Household structure will also be related to other factors. In Austria a lot of one-person households consist of young people, in other (mostly southern) countries it is mainly the old, because the young live longer with their parents. Also the availability of loans as well as cultural aspects or the population density might be linked to household structure. Thus, there is clearly a need to control for household composition when pursuing cross-country comparisons.

Also age patterns across countries matter. A household consisting of three adults will have different needs in terms of precautionary saving than a single mother with two kids below 14. These factors have to be taken into account when measuring net wealth levels. As we do not know the intra-household distribution of net wealth among household members it is not possible to plot a person-level wealth distribution without making assumptions about intra-household distribution. More research will be necessary to understand the role of household composition.

A simple assumption is that household wealth is shared equally by all house-

hold members (including children). Chart 3b shows the resulting personal net-wealth distributions presented analogously to chart 3a. Similar charts including all other HFCS countries can be found in the appendix. In general the country wealth distributions are somewhat closer at the personal level than at the household level. At the median, the figures range from just above the 35<sup>th</sup> euro area percentile for Germany to above the 85<sup>th</sup> euro area percentile for Luxembourg (at the personal level from around the 40<sup>th</sup> euro area percentile to below the 80<sup>th</sup>). That is not true for all parts of the distribution and the movement of a country's household distribution relative to its personal (household-size-adjusted household) distribution depends on the differences in household size and its distribution.

To provide an example: While Austria's household wealth distribution is below the euro area distribution (chart 3a) up to its 80<sup>th</sup> percentile, its personal distribution (chart 3b) is above the euro area personal distribution already from around the median onward. This demonstrates the effect of a higher number of single households on the results. The Greek distribution shifts further away from the euro area distribution in the upper part. While the 99<sup>th</sup> percentile is above the euro area 95<sup>th</sup> percentile in the household distribution it is below that benchmark in the personal distribution.

As the household is the unit of observation in the HFCS, households' differences matter in comparisons of household net wealth. As wealth is accumulated generally at the personal level, the most important variation is the number of persons a household consists of. Another important factor is age. These variables might explain part of the differences in net wealth between households and as a result

differences between countries if they differ structurally with respect to household composition.

## 2.5 Wealth versus Welfare

The HFCS covers the private wealth (referred to as net wealth or also net worth) of households, which must not be mixed up with “augmented wealth” (including also all entitlements to future pension streams), “total wealth” (including also human-, social- and cultural capital) or even welfare. Wealth is relatively straightforward to measure whereas welfare is much harder to pin down. Whereas the concept of welfare includes a notion of well-being the stock of wealth measured by the HFCS is a purely material concept. A certain amount of wealth need not even create the same volume of welfare for two persons with similar socioeconomic characteristics in a given country.

In its definition of wealth, the HFCS follows other well-established wealth surveys such as the SCF (Survey of Consumer Finances) or the EFF (Encuesta Financiera de las Familias) in Spain. Wealth can in general be – more or less easily – liquidated and transferred, and it can be used as collateral. Most individuals accumulate wealth for a rainy day, consumption, their children or old age provision (see Fessler et al., 2012a). Within the context of welfare programs, states partly provide substitutes for these forms of privately accumulated wealth. However, the degree to which states provide substitutes differs strongly from country to country. While in some countries individuals need to provide for old age themselves, in other countries saving for retirement is largely organized by the state via the public social security systems. While the pension systems might be one of the most important differences among countries, other dis-

similarities exist with regard to unemployment insurance, health insurance, maternity leave, family subsidies, other subsidies, and further state transfers which might affect saving patterns and therefore wealth accumulation.

To calculate the present value of an expected value of an insurance one has to take into account the value of the insurance and additionally the chance of an insurance incident taking place and insurance claims being honored. In the case of pension claims that implies knowledge of the year of retirement and information on life expectancy. In a household context the degree of complexity is especially high because of widow pensions and the conditional probabilities involved with those. Due to their different nature such claims are usually not part of scientific research on the distribution of private net wealth among individuals or households (see Davies and Shorrocks, 2000). Davies and Shorrocks use the term “augmented wealth” to refer to a broader definition of wealth also including all entitlements to future pension streams and at the same time point to a number of problems involved with such a broader definition (risk adjustments, discount rates, borrowing constraints, etc.). They are also not part of the ECB definition of private net wealth. Also the OECD (2013) points towards the importance of such future entitlements and possibilities to measure or estimate them, but at the same time also recommends the exclusion of pension entitlements in social security schemes for micro statistics mainly for the practical reasons mentioned above.

*“The exclusion of entitlements in social security schemes, as recommended here for micro statistics on household wealth, is primarily for practical reasons and to maintain consistency with the SNA’s definition of financial assets.”* (p. 71).

These differences might therefore explain part of the differences between wealth levels of otherwise similar households across countries. They are also relevant within countries as different households may be under different public insurance regimes, especially with regard to state pensions, depending on their age as well as occupation. In Austria the differences between self-employed persons, employees in the private sector as well as employees in the public sector may be especially pronounced.

There are also other forms of public services, like a safe environment, a cheap or even free well-functioning education system, an intact natural environment, and many more, which all will be relevant for welfare but are nevertheless not part of private household wealth. Private household wealth is only one, more or less important element of economic well-being. Wealth is special in so far as its functions for households change along its distribution. The wealth functions and their relation to well-being will differ in particular among rich and poor households. While in the lower wealth quintiles wealth serves precautionary purposes, it serves status and transfer functions in the middle and also power at the very top (see Fessler et al., 2012a).

There are publicly provided substitutes for private wealth, mostly in the form of future pension claims or claims on other types of insurances, which allow households in lower wealth deciles to consume more and bear less individual risk in society. The nature of these claims is different from private wealth as they can be neither liquidated nor transferred nor used as collateral. Nonetheless they might be an important factor explaining differences in wealth among households not only between but also within countries.

### 3 Conclusions

How accurate are the HFCS data? As the HFCS is very transparent with regard to the data production process it is an excellent tool for assessing a huge variety of economic questions. However, it is difficult to give an overall assessment of the “quality” of the HFCS wealth data. The most important quality issues concern statistical measurement.

Much deeper research is needed to better understand the multitude of factors influencing the dispersion of wealth in the euro area. Some national data sources may be potentially noncomparable. In particular the top 1% wealth shares are not suited for cross-country comparisons. Reaching an adequate portion of wealthy respondents in the HFCS will be a crucial challenge for each participating HFCS country in the second HFCS wave.

In this article we illustrate how the focus on means and medians can lead to misleading interpretation. Instead we argue for comparisons along the full unconditional net wealth distributions. Such analyses reveal large within-country variation as well as remarkable similarities between countries with regard to the distributions of net wealth.

Net Wealth distributions overlap considerably. In all countries there is a relatively large fraction of households with considerably higher net wealth than most of the households in all the other countries as well as a relatively large fraction of households with considerably lower net wealth than most of the households in all the other countries.

We discuss the relevance of household size and homeownership in this context and point out important caveats with regard to the interpretation of results. Household size matters and varies strongly between countries. In the appendix we summarize relevant

methodological differences which need to be taken into account in case of cross-country comparisons.

Country comparisons seem to be less problematic for economic models than for absolute values and the right tail of wealth distributions in particular. Caution is particularly needed when assessing the aggregate figures and households' estimates of business assets and income from financial wealth, which are much harder to assess for respondents than other components of wealth.

This paper addresses key issues of measurement of wealth related to the first wave of HFCS results. The most striking aspect of the wealth distribution in Europe is the high degree of wealth concentration in all euro area countries. Thus, if we want to address wealth inequality in the euro area, we need to concern ourselves mainly with inequality within countries and not inequality across countries. "The haves and the have-nots" (Milanovic, 2011) can be found in all countries of the euro area.

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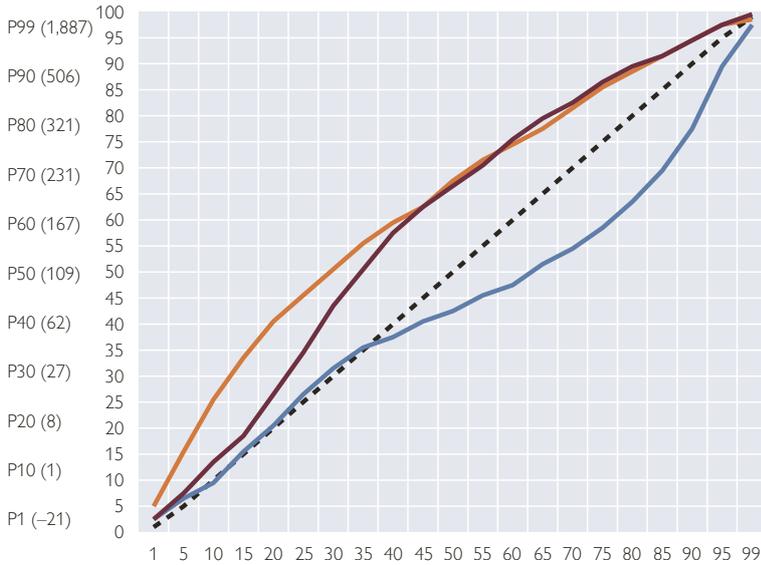
## Appendix

Chart 4

### Net Wealth Distribution in Europe Results for Belgium, Malta and Portugal

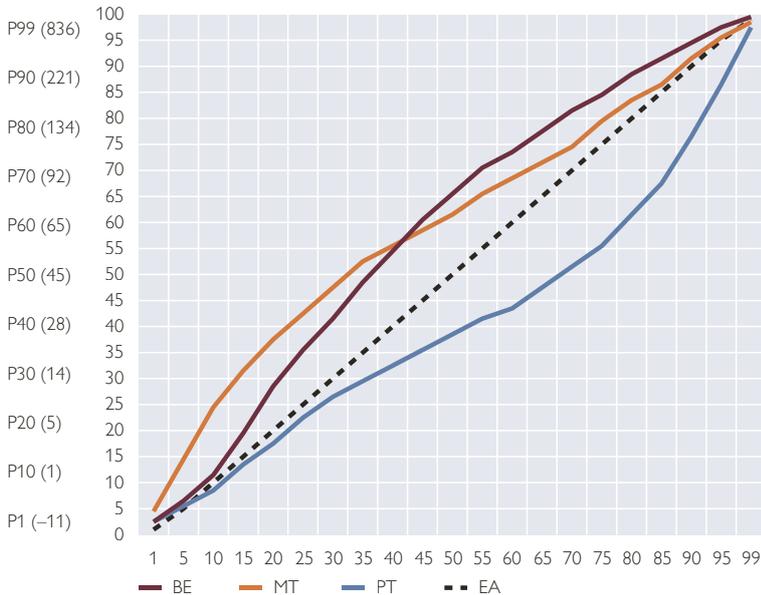
#### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



#### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

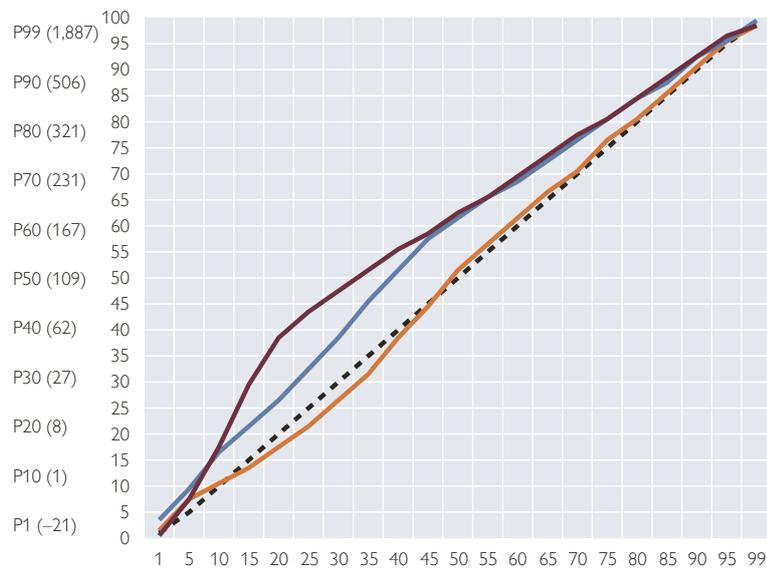
Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

Chart 5

## Net Wealth Distribution in Europe Results for Spain, France and Italy

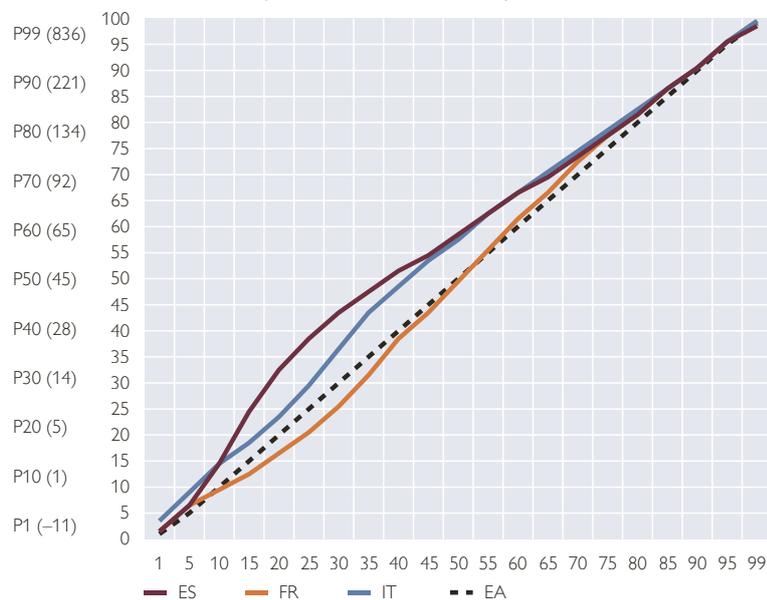
### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

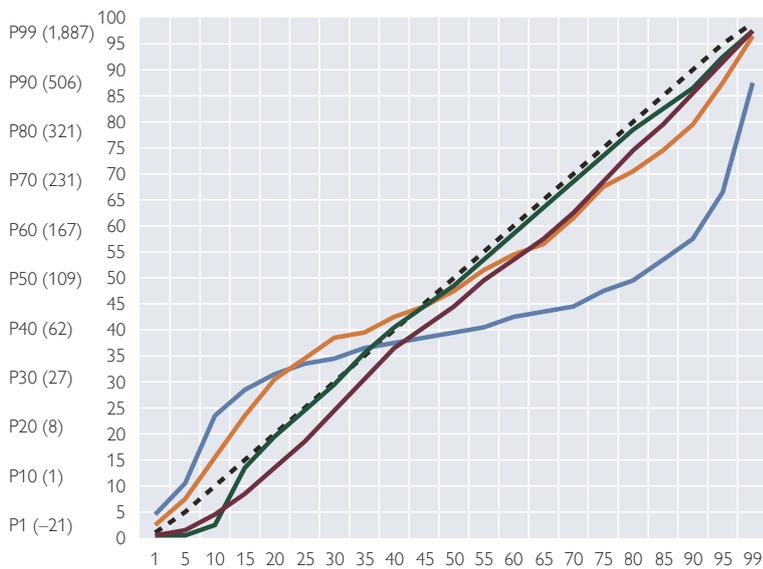
Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

Chart 6

## Net Wealth Distribution in Europe Results for Finland, the Netherlands, Slovenia and Slovakia

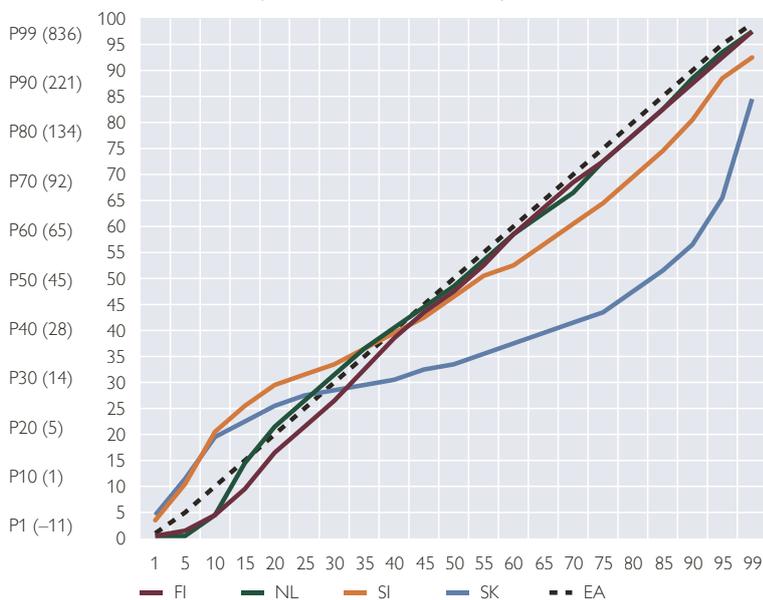
### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

## A Comparison of HFCS Results with External Sources

### A.1 Comparison with National Accounts Data

There is still a widespread belief that national accounts data are closer to true wealth figures than household surveys. Very often researchers try to assess the quality of a survey by looking at the coverage of a certain item with regard to a similar aggregate figure in the national accounts. A higher coverage is considered to be indicative of a high-quality survey. Such comparisons are, however, flawed for most variables, and they are especially problematic for wealth figures for various reasons.

First of all the goal of national accounts statistics is to provide a comprehensive and concise picture of the economy of a nation, including the state and the private sector as well as the so-called household sector.

*“National Accounts are constructed in a way that tries to minimise bias in the estimates for the economy as a whole, as well as to minimise statistical discrepancies within the system. Thus, some bias may be recorded in the household sector accounts to satisfy the balancing constraints of the whole system of accounts. In some cases, certain economic transactions for the household sector may even be derived as residual, by subtracting from the estimated total the estimates of other institutional sectors.”* (ECB, 2013b, p. 90)

The national accounts are based on calculations and estimations of aggregate statistics and do not include any information about the distribution of wealth among single units such as firms, households or individuals, which would be a necessary prerequisite for any distributional analysis. Even if the household sector aggregates of the national accounts were closer to the true aggregates of the target populations of household surveys, knowing them would not

provide any insights into the distributions among households.

Second, the household sector is not the sum of households as they are usually targeted in household surveys. Households are by definition only a subset of the household sector in the national accounts. The European System of Accounts (ESA) defines the household sector as consisting of two subsectors: the so-called consumer and producer households (sector 14) as well as nonprofit institutions serving households (NPISHs) such as churches, political parties, trade unions, etc., as well as private foundations, which are quite important in Austria (sector 15). Even if wealth in the national accounts could be estimated for sector 14 only, the household concept of the national accounts would still be broader than that of household surveys, as the latter define only the net positions of producer households as households' business assets, whereas the national accounts include all assets and liabilities. And finally, even if it were possible to only include similar net positions of producer households in the national accounts estimate, the latter would still include the wealth of all persons living in so-called institutionalized households, such as prisons, monasteries or homes for the elderly, which are usually excluded from household surveys. Especially the wealth of people living in homes for the elderly might be relevant and even become more relevant over time as the share of the total population living in such institutionalized households rises (ECB, 2013b).

Even if some estimates of financial wealth might be very precise (for the household sector as a whole), many financial and nearly all forms of real wealth in the financial accounts are very rough estimates – being based on investment figures, balance sheet infor-

mation for firms, sometimes even only on nominal capital instead of an estimate of market value, or a residual resulting from the estimates for the other sectors. This might be especially relevant for the most important item of the household balance sheet, the main residence.

In the national accounts the aggregate figure on dwellings is estimated using investment figures. Per definition, additional structural alterations made by the households, relative price changes because of location or other events will not change these estimates, which reflect only construction costs. Land property is recorded in a different way as well. In the HFCS, owner households estimate the actual market value of their main residence including the land it is built on. Literature has shown that this is the best way to approximate the hypothetical market values. Of course, true market values only exist if an item is actually sold and, unlike many financial assets that are identical in value at a given point in time (shares of a given firm), every real estate property is different, if only because of its different location, and therefore not representative of any other real estate properties. The HFCS also includes additional information such as the purchase price of the main residence, the size, the location, the neighborhood, and many other details which also allow for the estimation of values using external sources.

There are also large differences with regard to the title under which certain items are recorded. In the HFCS household real estate property in other countries is recorded as a real asset. In financial accounts on the other hand real estate property in other countries qualifies as financial asset under the position “other equity.”

However, being aware of the differences in their primary goals, in defini-

tions, target populations and estimations, comparisons with the national accounts might still be of great value to help us to better understand problems of both statistical datasets. Household surveys are plagued with coverage problems especially at the tails of the distribution. The extent to which the important top of the distribution is not covered is unclear (see section B.6). When carefully comparing certain asset classes and using some assumptions on the amount of wealth held by institutionalized households as well as the other known differences and general underreporting in surveys, we might gain some insights on how much of total net wealth might be missing because of coverage issues at the top. Looked at it from the opposite angle, the empirical distributions revealed by surveys may help us to better understand details masked by national accounts aggregates and might even help improve estimates of real asset figures.

Thus, we are skeptical about macro-aggregates as a benchmark for household figures. Those statistics have different objects with different reference populations. Besides that, for many microeconomic applications, and especially for the behavior of households as economic agents, the perceived value of an object is more important than some value estimated by somebody else. Nevertheless all country-level HFCS datasets include enough information to also estimate house prices by using external house price indices or other information.

## A.2 Comparisons with Other Surveys

To compare the HFCS results with those of other surveys makes sense as similar results might provide positive signals for the quality of all surveys compared (see Albacete and Schürz,

2013). Beside the fact that differences in results might reflect sampling errors even if methods and timing were identical, in most cases, certain differences with regard to target population, exact framing of the questionnaire, survey mode, interviewer training, editing, imputation and all other factors in the process of data production might be a source for possible differences in results.

The EU Statistics on Income and Living Conditions (EU-SILC) might in many respects be the survey most similar to the HFCS, even though there are other surveys that might be more reasonable candidates for comparison for specific countries (e.g. the German Socio-Economic Panel, SOEP) or sub-populations and certain items of the HFCS (The Survey of Health, Ageing and Retirement in Europe for wealth of the elderly).

Whereas in most countries EU-SILC and the HFCS target the same household population, that is not the case for Austria and Italy. In Austria, the target population of EU-SILC includes only households living in a dwelling officially registered in the Austrian population register as a main residence, while the HFCS household definition also includes households possibly living in dwellings which are not registered as a main residence. This leads to a smaller average household size and a larger estimate of the total number of households for the Austrian HFCS (see ECB, 2013b, p. 99).

Furthermore, data collection methods differ substantially. Whereas the HFCS is a priori harmonized with regard to as many steps in the data production process as possible, the variety of different methods of data gathering (register vs. survey, different survey modes) is larger in EU-SILC. Finally, the HFCS provides harmonized stochastic

multiple imputations based on a Bayesian chained equation approach allowing variance estimation which takes into account the uncertainty from imputations as well as replicate weights which take into account the different complex survey designs. Combined, these allow for calculations of standard errors of estimates which are not artificially lowered by ignoring both phenomena.

As the HFCS is the first euro area-wide harmonized dataset on wealth, no other survey exists which would allow for comparisons with regard to this dimension.

Comparisons with other surveys might be helpful in order to gain some confidence in both surveys compared if the results are close. But this is only valid if the target populations are the same and if the methods used in data gathering and the statistical procedures used in the data production process are sufficiently similar.

## **B Methodological Comparability Issues**

This section highlights the most relevant comparability issues resulting from remaining differences in HFCS methodology. Though the HFCS ensures extensive harmonization compared to other cross-country survey projects, still more transparency concerning details of data production and more harmonization is needed. Differences in data production are one key to understanding cross-country differences. If overlooked, some differences attributable to them might be misleadingly attributed to other cross-country differences.

The euro area HFCS was guided by harmonized principles and methodologies with regard to all steps of data production. It is so far the only data source available for scientifically com-

paring net wealth at the household level among a large numbers of euro area countries. The degree of harmonization is large, which might imply that the HFCS even might offer an advantage in terms of income distribution comparisons over other datasets that survey income in greater detail but lack solid harmonization of the data production process across countries (EU-SILC).

However, one has to bear in mind that all decisions made with regard to the formulation of the questions asked, definition of the target population, sampling design, coverage, nonresponse, survey mode, editing, imputation, weighting design, tools for variance estimation and all other steps of survey production will have an influence on the bias and variance of estimates based on final data.

As regards the statistical processing, the HFCS established high-level frameworks and in some instances made fairly detailed prescriptions. But inevitably, there was room for interpretation and judgment, and the resulting variation may potentially affect the degree of true bias or uncertainty that is actually measured.

For example, the trimming of weights for outliers typically lowers the measured variance of final estimates, but at the expense of introducing a formal bias relative to the original sample design. There are similar trade-offs in other aspects of statistical processing, including adjustments for unit nonresponse, imputation, variance estimation procedures, and other areas. It should therefore be taken into consideration that datasets in which variance was traded against bias will more often deliver significant results, even though they may have a larger true bias, which cannot be measured (see also ECB, 2013b).

### **B.1 Timing**

Some differences within the HFCS are given a lot of attention, such as differences in the recording of data with respect to timing. Of course timing is an important issue with regard to comparability, and a goal of the HFCS is to increase coordination with regard to fieldwork. While most of the fieldwork took place in 2010/2011, there were exceptions for Spain (2008/2009), France (2009/2010) and Greece (2009). However, in the case of wealth surveys, timing is not as important as in surveys of income and consumption. Wealth as a stock is more stable than flows, and in comparison to other issues this will influence the results not that much. Patterns of wealth distributions are relatively stable over time – even in the United States, where more volatile forms of wealth like stocks are more widespread among households. Furthermore, many other data sources of asset price developments (e.g. house prices indices) are estimations themselves (e.g. in the case of Austria) and are often based on actual transaction prices that are hardly representative of the stock of real estate held by the full household population.

### **B.2 Sampling**

How the sample is drawn is a major element for the success of a survey. In all countries but Slovakia probability sampling was used. All units in the sample frame (representing the target population as well as possible) have a positive probability of being selected into the sample. Also the types of sample frames differ across countries. In some countries, telephone registers or other customer registers were used, in others, lists of dwellings derived from some sort of postal addresses or population registers. How well each frame mirrors the related target population is

unclear. For Austria detailed documentation can be found in the Methodological Notes (Albacete et al., 2013).<sup>2</sup> Differences also exist with regard to stratification as well as the number of stages and clusters. In Slovakia the income distribution mirrors that of EU-SILC – making the calculation of proper design weights impossible (ECB, 2013b, p. 30). As quota sampling is not based on probability there is no way to estimate correct sampling and standard errors. In the Netherlands an internet-based survey is used, which also might lead to severe problems with regard to representativeness of the sample and further comparability issues with regard to the survey mode.

### **B.3 Survey Mode, Field Phase Monitoring and Editing**

The standard method of data gathering used in the HFCS is a personal survey via Computer-Assisted Personal Interviewing (CAPI).

Finland deviates considerably from this method by gathering most wealth information from administrative data sources. While the latter might even have advantages with regard to measurement error, it allows for less detailed disaggregation and presumably leads to a lower degree of comparability with the other countries. The use of administrative data along with survey data might be problematic for cross-country comparisons (Lohmann, 2011). Additional information for Finland is largely based on Computer-Assisted Telephone Interviewing (CATI). Cyprus used CATI<sup>3</sup> (88% of observations) as well as CAPI (12% of observations). Finally, the

Netherlands used Computer-Assisted Web Interviewing (CAWI), a technique which might be especially problematic in terms of selective nonresponse and/or measurement error. Therefore, for comparisons with Finland, the Netherlands and Cyprus, the effects of different survey modes and data gathering techniques in general might be relevant and needs to be investigated carefully (De Leuww, 1992 and 2008).

Field phase monitoring and editing might be another relevant issue with regard to comparability. Whereas in some countries recontacting households was not possible at all (Germany, France, Luxembourg, Slovakia), households were extensively recontacted in others (Spain, Austria). Recontacting households makes it possible to prove/falsify extraordinarily high values or to clarify seemingly implausible answers of respondents and therefore reduces edits because of so-called “outliers.” See the Methodological Notes (Albacete et al., 2013) for an extensive documentation on editing in the Austrian HFCS.

### **B.4 Weighting**

Statistical data analyses based on samples suffer from different problems of misrepresentation. The most important source of misrepresentation in surveys is selective nonresponse. As long as the participation of households drawn into the sample is random, nonresponse would only lead to less precision (higher variance) but not bias the resulting estimates. In general, nonresponse in surveys on sensitive topics like income and wealth cannot be assumed to be random. In order to reduce this bias,

<sup>2</sup> Note that the household definition is different from the one used by Statistics Austria (Microcensus or EU-SILC), which only samples households at officially registered main residences in the Austrian “Melderegister.” This approach excludes all other households that may live in a dwelling not officially registered as a main residence. Statistics Austria reweights the sample to the total population under the assumption that excluded households are on average equal to the sampled ones.

<sup>3</sup> To a minor degree CATI was also used in Italy (15% of observations) and Malta (19% of observations).

nonresponse weights are calculated. To achieve meaningful nonresponse weights, information on both respondents and nonrespondents, i.e. all units in the gross sample, has to be available. The nonresponse weights in the Austrian HFCS also include interviewer-level information which was found to be relevant to predict nonresponse probabilities of sampled units. Detailed information on the weighting procedures in Austria can be found in the Methodological Notes (Albacete et al., 2013). It is unclear how strongly the weighting procedures differ across countries. And especially with regard to the important nonresponse weights it remains unclear how much information on nonrespondents and/or interviewer information was available to establish models of nonresponse probabilities. This topic needs to be further investigated in order to understand the possible role of nonresponse weighting with regard to the bias and variance trade-off in different countries. What is documented in the ECB Report (ECB, 2013b, p. 43) is the existence of weight trimming or limitations for weight adjustment factors in many countries (Greece, Finland, Germany, Luxembourg, Malta, Slovenia, Slovakia and Spain), which in general lead to additional bias and a decrease in variance. To better understand the degree of those effects more information on the exact procedures would be necessary for the second wave of the HFCS.

### **B.5 Imputation**

State-of-the-art multiple imputation based on a Bayesian chained equation approach is the HFCS standard procedure. A common approach toward item nonresponse which is based on stochastic as well as multiple imputation is necessary in order to reduce bias resulting from selective item nonresponse and, at the same time, to reflect the

uncertainty arising from the imputation process itself. All countries but Finland and Italy use this HFCS Standard Approach (ECB, 2013b, p. 47). However, the quality of imputation may differ. Some countries followed a broad conditioning approach more rigorously than others, including as many independent variables in the models as possible to preserve the relationships between as many variables as possible. Some countries used weighted regression or the weights as independent variables. Both reduce bias but at the same time increase variance. Automated model selection was used by some countries as opposed to a time-consuming user-based model specification. In Austria, for imputation as for all other steps of survey production, the primary goal was to reduce bias, even if at the cost of a certain increase in variance.

### **B.6 Coverage – Top of the Wealth Distribution**

Full coverage of the target population is essential for any survey. One important issue is to understand that most household surveys (including the HFCS) do not include the entire population. Institutionalized households such as people living in prisons, hospitals or homes for the elderly are excluded from the target population.

But even the target population is not fully covered. Especially the very top of the wealth distribution is hard to reach in household surveys. Selective nonresponse at the top of the distribution is a major issue because the wealth distribution is extremely skewed. We do not know what percentage of the wealthiest households is missing at the very top and we do not know to what degree different countries in the HFCS managed to include the very top.

There is reason to believe that oversampling of the wealthy might help

to increase precision and (because of the additional information about the wealthy) increase coverage at the top. It remains unclear how much these coverage issues compromise comparability especially for measures depending on the very top of the distribution or non-robust estimators (as e.g. top 1% shares or the mean).

Given the maximum household net wealth level reached by the Austrian survey (EUR 17 million), we can make an educated guess that around 0.5% at the very top of the distribution might be missing entirely. This guess is based on the trend list of the 100 richest persons in 2012 that starts with EUR 100 million. Under the assumption that the

net wealth of only a few thousands of households is in the range between EUR 17 million and EUR 100 million we may conclude that only a small group of wealthy households is missing. Given the fact that nonresponse weights might only to some extent remedy the nonresponse bias with regard to wealthier individuals it is very likely that also the relative amount of wealth held by the top 10% is downward biased. Oversampling of the wealthy was not possible in the case of Austria. The Austrian HFCS does not claim to represent the full range of the wealth distribution. Without the use of special sampling frames the sampling design will miss the very top of the distribution.

# Funding Strategies of Sovereign Debt Management: A Risk Focus

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*Most sovereign debt management agencies operate on a narrow definition of risk which does not reflect the potential of sovereign debt portfolios to insure the budget against macroeconomic shocks. This paper analyzes the different forms of risk implied by the composition of the sovereign debt portfolio and discusses methods for their evaluation. By determining the risk properties of existing debt management instruments we underline the potential of certain debt management instruments to insure the budget against stylized demand and supply shocks producing strong incentives for debt management agencies to operate on a broader definition of risk. The identified risk properties further highlight that the establishment of Economic and Monetary Union reduced market, rollover and liquidity risk in the aggregate euro area debt portfolio, whereas the loss of the risk free status for euro area sovereign assets and the steepening of the yield curve, both triggered by the sovereign debt crisis, led to a shift towards more short-term debt resulting in an increase in rollover risk and market risk.*

*JEL classification: H63, E62*

*Keywords: sovereign debt management, portfolio optimization, fiscal insurance theory*

## 1 Introduction

As discussed in the economic literature of the past 50 years, the objectives of managing debt are manifold in both theory and practice and they differ significantly across countries and stages of economic development.

There are two basic perspectives on the topic of sovereign debt management. The macroeconomic perspective focuses on all welfare implications of debt management decisions while the “micro portfolio optimization perspective” (or “finance perspective”) solely focuses on debt servicing costs.

The literature approaching the subject from the macroeconomic perspective<sup>2</sup> addresses two conflicting objectives of sovereign debt management: expected cost minimization and risk minimization. Building on the optimal taxation literature by Barro (1979), Lucas and Stokey (1983) and Bohn (1990), most of the macroeconomic works support the risk minimization objective, which emphasizes the role of sovereign debt management in smoothing taxes through time-varying returns

on liabilities. Based on Faraglia et al. (2008), this risk minimization objective, which implies a smoothing (immunization) of the government budget against exogenous macroeconomic shocks, became known as the “fiscal insurance theory” of public debt management. Despite the fact that the macroeconomic literature has also produced arguments in favor of a cost minimization objective of sovereign debt management, empirical findings in favor of this objective are rare and not convincing (e.g. Missale, 1999).

Contrary to the macroeconomic literature, authors approaching the subject from a micro portfolio optimization perspective identify the expected debt servicing cost minimization objective as the indisputable objective of sovereign debt management.

The reason behind the support of different objectives by finance and macroeconomic theory ultimately lies in the different definitions of risks considered. Micro portfolio optimization incorporates a narrow concept of risk limited to the risk of servicing, issuing

<sup>1</sup> Comments by Ernest Gnan, Eva Hauth, Walpurga Köhler-Töglhofer and Lukas Reiss are gratefully acknowledged.

<sup>2</sup> For a detailed survey on the macroeconomic literature on sovereign debt management see Missale (2012).

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or refinancing debt at unexpected costs. Macroeconomic theory, on the other hand, employs a broad concept of risk which includes all welfare effects that may arise from “uninsured” tax revenue reductions or expenditure increases triggered by exogenous shocks.

The different approaches toward public debt management are also mirrored at the institutional level. Sovereign debt management in OECD countries has shifted from operational bodies within finance ministries or central banks to partly or fully independent entities. This operational transformation has been accompanied by a change of debt management objectives, i.e. a shift from a macroeconomic perspective to the expected cost minimization objective (Hoogduin et al., 2010).

Nowadays most of the debt management offices worldwide follow the Guidelines for Public Debt Management published by the IMF and the World Bank in 2001: “*The main objective of public debt management is to ensure that the government’s financing needs and its payment obligations are met at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk.*” These guidelines define risk as all potential increases of debt servicing costs related to market, rollover, liquidity, credit and operational risks and therefore reflect the micro portfolio optimization perspective (finance perspective) on sovereign debt management. Welfare implications of potential “uninsured” revenue/tax variations are not considered.

Recent developments have increased awareness that the composition of sovereign debt portfolios significantly affects the vulnerability of government budgets, a fact which was even reflected

by a revision of the IMF public debt management guidelines. The Stockholm Principles (IMF Forum, 2010) explicitly focused on improved communication among debt managers and monetary, fiscal and financial regulatory authorities and reflect a move toward a somewhat broader definition of risk than is applied by sovereign debt management in practice.

Our work elaborates on the existing conflict between optimal sovereign debt management strategies derived from macroeconomic theory and debt management strategies employed in practice. In this context we focus on the unexploited potential of sovereign debt portfolios to insure against or to amplify macroeconomic shocks. We underline that debt management agencies should reflect potential fiscal vulnerabilities (i.e. a broad definition of risk) arising from the composition of sovereign debt ultimately reflected by their funding strategies.<sup>3</sup>

This paper is structured as follows: Chapter 2 focuses on debt servicing costs and debt management risks. The potential sources of risk reflecting the macroeconomic and finance perspective of sovereign debt management are discussed and a selection of cost and risk indicators is presented. Chapter 3 focuses on the pool of available debt instruments and identifies their implied risk characteristics. Against this background, chapter 4 evaluates the risk implications of changing sovereign debt management strategies for EMU member states over the periods 1999 to 2007 and 2008 to 2011. Chapter 5 summarizes the findings.

To simplify the analysis, we limit our attention to the liability side of the debt management agency’s portfolio,

<sup>3</sup> For a detailed description of the debt management strategies of selected countries see Bergström et al. (2002), Bolder (2003), OECD (2005), Bolder and Rubin (2007) and Denmark’s Nationalbank (2010).

i.e. we do not address assets in the analysis.<sup>4</sup> In addition, due to complexity issues and the lack of publicly available data we do not consider derivative products, which clearly have the potential to substantially change the cost-risk profile of the debt portfolio.<sup>5</sup> Any interpretations of our results should keep these caveats in mind.

## 2 Costs and Risks Considered in the Portfolio Optimization Problem

For debt instruments that are traded on the market, evaluating the expected debt servicing costs of new issuances is straightforward. If one assumes that the issuance of debt does not change the yield curve,<sup>6</sup> one can simply observe the corresponding benchmark yields for fixed-rate instruments or the discounted margin for variable interest rate bonds.

Evaluating the associated risks is more complex given the range of risks that have to be considered. Following the IMF/World Bank guidelines, the first part of the chapter discusses the different forms of risk that are considered in practice. We distinguish between five subcategories of risk arising from sovereign liability management: market risk, rollover risk, liquidity risk, operational risk and reputation risk. Each of the categories represents potential reactions of debt servicing costs to specific types of economic developments. The second part of the chapter focuses on the macroeconomic risks of sovereign liability management which determine the degree of fiscal vulnerability and fiscal insurance implied in the sovereign debt portfolio. We do,

however, not elaborate on the evaluation of welfare losses but only discuss the degree of insurance the debt portfolio offers against macroeconomic shocks. In the last part of the chapter we briefly describe the multi-stage process of portfolio optimization.

### 2.1 Risks Considered in the Micro Portfolio Optimization

#### Market Risk

Most references (e.g. IMF, 2001) consider market risk to be solely defined by cash flow at risk, which refers to all potential changes of sovereign debt servicing costs (principal or coupon payments) due to changes in interest rates, exchange rates, inflation, commodity prices or GDP growth rates. The sensitivity of debt servicing costs to changing market conditions is crucial for the level of cash flow at risk implied by a sovereign debt portfolio. Besides this type of market risk, debt management agencies also consider value at risk (VaR), which captures all potential changes of the market value of the issued debt as a potential source of market risk since it covers information about potential costs or revenues arising from debt switches or debt buy-backs. In principle, any change in the market value of the debt portfolio can be translated into cash flow changes via the use of financial derivatives. From the insurer perspective, VaR appears to be of limited relevance if one does not consider the use of derivative products, which is the case in our analysis. We therefore follow the standard IMF/World Bank definition of market risk, which excludes value at risk as a source of market risk.

<sup>4</sup> IMF (2012) offers a broad theoretical description of a combined asset and liability management approach that considers both sides of the governmental balance sheet.

<sup>5</sup> For a detailed description of the use of derivative products by public debt managers see Piga (2001).

<sup>6</sup> Large issuance volumes may cause price changes in different segments of the yield curve.

Market risk can be evaluated with a variety of deterministic and stochastic indicators. The most widely used indicator is the *Macaulay duration*, which corresponds to the weighted average time to maturity of the portfolio. For fixed-rate instruments, it measures how long it takes for coupon and principal cash flows to repay the price of a bond. For variable-rate bonds, future cash flows are not known and the Macaulay duration is simply defined as the time until the interest rate is re-fixed. From the issuer perspective, the longer the duration, the lower the risk of higher debt service payments due to interest rate changes. Duration is influenced by the level of coupon payments and yields, where high coupon payments and high yields imply low duration and high market risk for the issuer. Other indicators measure the *average time to re-fixing* of interest rates on outstanding principal. A low value indicates high risk, since a relatively high share of debt will have its interest rates re-fixed in a relatively short period of time.

More complex indicators of market risk use simulation techniques that build on concepts developed by private financial institutions. In the context of sovereign debt management the widely used concept of value at risk (VaR) is modified into an absolute *cost at risk* metric (CaR). CaR calculations, which come in various forms,<sup>7</sup> generate the distribution of debt servicing costs by simulating changing market conditions (e.g. the term structure of interest rates and exchange rates) and identify violations of a given benchmark (e.g. the 99<sup>th</sup> percentile of the debt servicing

costs distribution). Based on the absolute CaR measure the *conditional cost at risk (CCaR)* evaluates market risk in the case of extreme events or so-called tail risks. CCaR refers to the maximum potential increase in the debt servicing costs of a debt portfolio with a given probability over a preset horizon given that the CaR benchmark is violated. The mean of CCaR (*mean excess loss or expected shortfall*) can therefore be used as a proxy for tail risks.<sup>8</sup>

### Liquidity Risk

In the context of sovereign liability management, market liquidity risk identifies the problems of selling significant quantities of a security in a quick, anonymous way with a rather small impact on the price. The *size of the debt market* and the *composition of the investor base* are crucial elements in determining market liquidity. *Trading volume*, *bid-ask spreads* and *yield spread between on-the-run* (most recently issued and hence most liquid units of periodically issued securities) and *off-the-run* (older issues, traded at a discount to on-the-run securities) securities are additional standard measures of market liquidity. Futures offer the possibility to insure against bond price movements. This is the reason why bonds with a corresponding liquid futures market attract a broader investor base and therefore show higher liquidity premiums (e.g. a phenomenon observed for German bonds during the recent financial crisis; see Ejsing and Sihvonen, 2009). The ratio of *futures turnover and bond turnover* is a proxy for the liquidity of and activity on futures markets for sovereign debt. A larger ratio implies higher market liquidity for

<sup>7</sup> Simulations can be purely deterministic, with the size of shocks being determined by statistic properties (parametric CaR) or historic observations (historic CaR), while others are stochastic, deriving the size of shocks from a set of random numbers (Monte Carlo CaR) or stochastic dynamic optimization models.

<sup>8</sup> For a detailed description of the existing CaR methods see IMF (2012).

the bond market. Fostering derivative markets for sovereign debt can therefore increase market liquidity and reduce liquidity risk.

### Rollover Risk

The risk associated with unexpectedly high refinancing costs (e.g. higher credit risk premiums, changing market conditions) or difficulties in refinancing expiring debt can be summarized by the term rollover risk. The separation between market risk and rollover risk is not clear-cut, since rollover risk caused by potentially higher debt servicing costs for debt redemptions could also be defined as market risk. The same is true for the separation between rollover risk and liquidity risk since problems selling instruments on the market also lead to liquidity risk. Despite the problems with presenting a clear-cut distinction between the different risk categories, we follow the most commonly used IMF (2001) definition and summarize all risks connected to debt rollovers in this separate category.<sup>9</sup> The simplest way to identify rollover risk is to examine the *redemption profile* of a debt portfolio (redemption profiles of selected euro area countries can be found in the appendix). Peaks mark large concentrations of rollover needs and therefore imply large rollover risk. In practice, a variety of alternative rollover risk indicators are in use. For instance, the *residual maturity* of debt, which identifies the share of total debt falling due within a certain period of time, reflects the potential risk for the budget for a certain time frame. The *average residual maturity* of debt evaluates the weighted average length of the outstanding debt's life, with the weights of each debt instrument reflecting the amounts of outstanding principal. High

values imply low rollover risk, since relatively more redemptions are taking place in the more distant future.

### Operational Risk

As defined by the Basel Committee, operational risk is “*the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems, or from external events.*” Due to its nature, operational risk differs for each institutional setup and can hardly be measured by standardized indicators. In general, operational risk is positively correlated with the degree of complexity of debt instruments because more complex instruments involve a sensitive methodical framework and a larger operational body. Unlike other risk categories, operational risk does not have a direct link with debt servicing costs; high levels of operational risk do not imply low debt servicing costs.

### Reputation Risk

Debt servicing costs are crucially dependent on the record of a government as a reliable debtor. Any action that harms this reputation pushes up debt servicing costs in the medium to long run. In the extreme case, debt management agencies can severely harm a country's track record by enforcing legal changes (e.g. ex post implementation of collective action clauses) or by defaulting on debt. While such an action could be accompanied with lower debt servicing costs in the short run, medium- to long-run debt servicing costs increase due to substantially higher credit risk premiums. Various studies show that sovereign debt markets appear to have a good memory when it comes to defaults, which thus may have lasting consequences (Cruzes and Trebesch, 2013).

<sup>9</sup> Nevertheless market risk indicators such as the Macaulay duration also reflect some rollover risk.

## 2.2 Macroeconomic Risk – Budget Risk<sup>10</sup>

A welfare-maximizing approach of public debt management has to smooth taxes over time. The occurrence of macroeconomic shocks implies substantial changes in government revenues and expenditures, which can make tax adjustments inevitable. This is especially true in the light of limits to government debt levels and the non-linear behavior of yields. Budget risk captures the risk of such potentially welfare-reducing adjustments due to variations of macroeconomic variables. It directly refers to the broad definition of risk employed in the insurance theory of public debt management. From the perspective of macro-oriented sovereign debt management, budget risk is defined by the *sensitivity of debt servicing costs to changing macroeconomic environments* and especially *to economic cycles*. In particular, debt servicing costs that are positively correlated with the economic cycle (procyclical) imply that the government budget shows a positive degree of insurance against macroeconomic shocks. High positive correlations therefore imply low budget risk and vice versa. Despite the fact that the budget balance minimum target defined by the Stability and Growth Pact heightens the relevance of this type of risk, it has so far played a negligible role in the portfolio optimization process of public debt management, as debt management agencies do not employ a broad definition of risk.

## 2.3 Portfolio Optimization – A Multi-Stage Process

The first step of optimizing debt management, which is a multi-stage process, is to allocate risk weights to the individual risk categories in line with the guiding debt management objective and risk definition. If a macroeconomic approach is followed only the budget risk category is considered in an optimization problem, whereas a micro portfolio optimization has to evaluate the importance of each micro portfolio risk category (see section 2.1) via the level of risk weights. Besides the decision on the risk categories and their respective weights, debt management strategies also have to obey certain benchmarks<sup>11</sup> for debt servicing costs (e.g. maximum level of debt servicing costs to GDP) or risk levels (e.g. minimum average maturity of debt, duration bands) which are pre-determined by the government. Together with debt servicing costs, the considered risks and debt benchmarks define the set of feasible debt portfolios in the cost-risk dimension and the efficient market frontier.<sup>12</sup>

The second step is to identify the utility-maximizing cost-risk profile – i.e. the optimal debt portfolio – within the range of efficient portfolios. This can be done by means of various optimization methods (e.g. the prominent linear mean-variance optimization). In the case of predefined strategic portfolio targets (benchmarks) for debt servicing costs or overall risk, the optimization problem is a constrained return-maximization or constrained

<sup>10</sup> Budget risk as defined here should not be mixed up with the volatility of government debt servicing costs, an alternative interpretation of the term employed in practice.

<sup>11</sup> Market risk benchmarks for certain OECD countries can be found in Blommestein (2009).

<sup>12</sup> The efficient market frontier identifies all efficient portfolios that offer the highest expected return for a certain level of risk, or the lowest risk, for a certain level of expected return.

risk-minimization problem.<sup>13</sup> The third and last step of the optimization process is to determine the micro structure of the portfolio that matches the cost-risk characteristics of the optimal portfolio by selecting adequate debt instruments.

In practice, debt management agencies rarely publish information about risk weights or debt benchmarks. In the EU, the practices of debt management offices differ considerably. The tradition of transparency in northern Europe contrasts with the tradition of vague references to risk positions and debt portfolio patterns (particularly for derivative positions) in all other euro area countries.

### 3 Financial Liability Instruments Used by Sovereign Debt Managers

In order to generate the optimal risk profile, debt management agencies can draw from a variety of instruments, irrespective of which perspective they rely on. These instruments fall into three broad categories under the definition of government debt in the System of National Accounts 2008: currency and deposits, loans and debt securities.

#### 3.1 Classification of Financial Liabilities

##### Currency and Deposits

Currency captures all liabilities arising from floating banknotes and coins that are not classified as liabilities by other sectors (i.e. the central bank). Deposits can take the form of interbank positions, other transferable deposits (e.g. savings bonds) and other deposits (specifically unallocated gold deposits). Most EU countries hold only a small part of total debt in the form of currency and deposits, the exceptions being Ireland (9%), Italy (7.9%), Portugal (5.9%),

Sweden (6.1%) and the U.K. (9.7%). These liability instruments are mainly used for short-term oriented liquidity management operations.

##### Loans

Loans do not require a large institutional setup and can be issued with low operational costs. Hence loans appear to be advantageous for illiquid debt markets. For markets which are characterised by a small size and a small investor base it would be relatively costly to build up and maintain the operational body necessary to issue debt securities. Especially in a situation where individual investor needs have to be addressed with individual nonstandard debt contracts, loans appear to be advantageous. Most subnational debt markets in Europe appear to match the described characteristics. This explains why they rely extensively on loans: In the euro area, they account for about 50% of government debt at the state and provincial level. Municipalities hold their debt almost exclusively in the form of loans. In comparison, the share of loans in the euro area central governments' debt portfolio (11% of total) is relatively small. The liquidity argument in favor of loans also holds for the total sovereign debt profile of countries with relatively small capital markets. Estonia, Luxembourg and Cyprus hold large shares of debt in the form of loans in their portfolio. The large share of loans for Portugal, Greece and Ireland are a statistical artefact largely due to loans provided in the context of rescue programs by the international community. Countries with large debt markets like France, Spain and Italy do not fund themselves extensively via loans (see chart 2). The relatively large part of loans in the German debt portfolio can

<sup>13</sup> For a detailed description of existing optimization methods see Connor et al. (2010).

again be explained by the preferences of the subsectors, which are especially important for federally organized countries.

### Debt Securities

Unlike loans, the issuance and management of debt securities requires a sophisticated institutional setup and implies large fixed costs. This is the main reason why only relatively large debt markets with a sufficient level of liquidity issue debt securities to raise funds. Chart 1 shows that debt securities account only for a very small part of the debt portfolio of local governments (7% of total debt) while they dominate the state and provincial government portfolios (51% of total debt) and especially the central government portfolio (84% of total debt).

Debt securities are standardized products that are easy to trade via markets.

### 3.2 Characteristics of Financial Liabilities

The described financial instruments differ in terms of maturity, interest rate structure and currency denomination. These characteristics to a large extent decide about costs and risks of certain debt instruments. In the following subsections we describe the potential benefits of all characteristics, determine their influence on the various types of debt management risks and discuss their importance throughout the euro area.

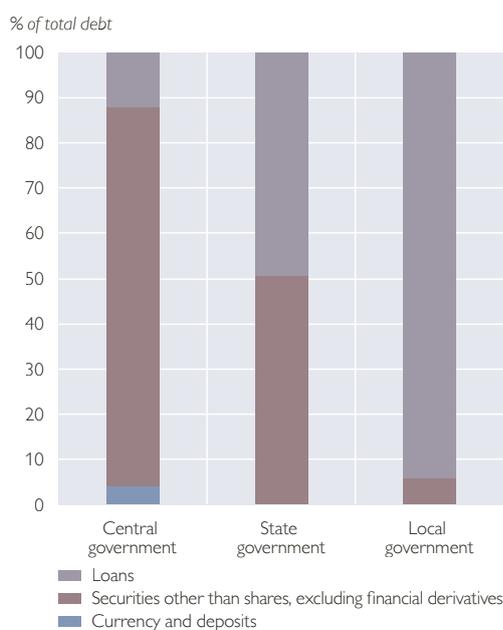
#### Maturity

In “normal times” (i.e. in times of moderate expectations about future inflation and economic growth and moderate default probabilities) the yield curve (interest rate profile for different maturities), is upward sloping<sup>14</sup>. This implies that yields increase with maturity, since investors have a preference for short maturities given lower uncertainty and lower moral hazard. Debt with short maturities will be the instrument of choice if cost minimization is the main objective of debt management despite the substantial amount of implied rollover risk. Under special economic circumstances (e.g. expectations about strong economic slowdowns or low future inflation) the yield curve can become inverted. In these cases, issuing on the short end of the curve can imply higher debt servicing costs than issuing on the long end.

Short-term debt issuance supports anti-inflationary credibility since the interest rate is readjusted continuously in line with changing inflation rates.

Chart 1

#### Subnational Use of Debt Securities in the Euro Area: Q4 12



Source: Eurostat.

<sup>14</sup> For a detailed description of the various arguments for an upward sloping yield curve see Fabozzi and Mann (2005).

Missale and Blanchard (1994) show that for governments with low anti-inflationary credibility it is optimal to issue short-run or price level-indexed debt.

Concerning macroeconomic risk, debt instruments with long maturities and fixed interest rates imply constant (acyclical) debt service costs over a long horizon, unaffected by changing macroeconomic conditions. Hence debt instruments with long maturities and fixed interest rates (cash flow is fixed until maturity) imply high macro/budgetary risk if refinancing costs are low during economic downturns (act procyclically) and vice versa.

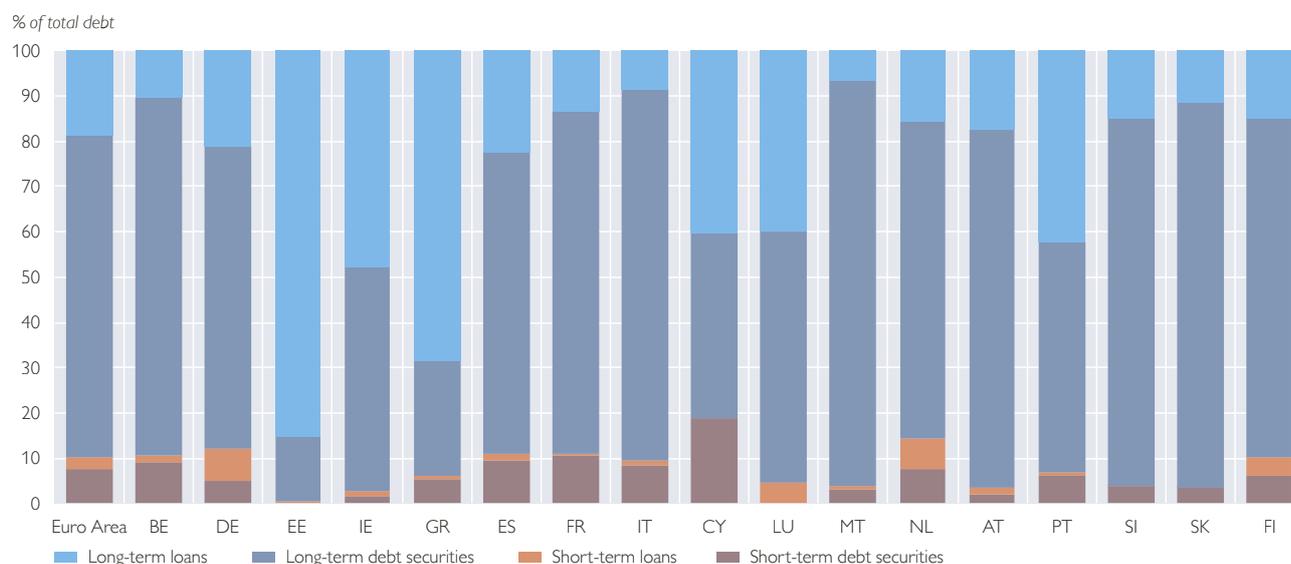
In a model world where sovereign assets are risk-free, the cyclical behavior of refinancing costs follows the cyclical behavior of interest rates. Yet if sovereign assets carry risk, economic cycles also influence country risk premiums. This implies that the cyclical behavior of refinancing costs is not solely determined by the cyclical behavior of interest rates but also by the change of the country risk premiums. This is evidenced by

the divergent effects of the most recent economic downturn on the refinancing costs of Germany, a low-risk country, and Greece, a high-risk country. Despite the fact that the common monetary policy counteracted the economic slow-down by cutting interest rates, German refinancing costs decreased while Greek refinancing costs rose due to substantially increased country risk premiums. If debt management tries to reduce macroeconomic risk implied in the debt portfolio, it has to consider how sensitive country risk premiums react to macroeconomic shocks. Countries that put a strong emphasis on insuring against future increases of country risk premiums should issue debt with long maturity (see Missale, 2012).

Within the euro area, sovereign debt portfolios differ substantially in terms of their maturity structure (see chart 2). On the one hand, Estonia, Ireland, Greece, Luxembourg, Austria and Poland almost exclusively hold long-term debt. Countries like Germany, France, Cyprus and the Netherlands on

Chart 2

### Public Debt Portfolio in the Euro Area: General Government – Q4 12



Source: Eurostat.

the other hand, hold short-term debt (debt with residual maturity of up to one year) representing well above 10% of total debt.

### Interest Rate Structure

The cost-risk profile of debt instruments further depends on whether cash flows are fixed (fixed-rate bonds) or variable over time (floating-rate bonds). Coupon payments of floating-rate bonds are linked to certain reference indices. The (market) risk of interest changes is carried in full by the sovereign. The reference indices of floating-rate bonds can take various forms, traditional benchmarks being money market rates like LIBOR or EURIBOR.<sup>15</sup> Since floating-rate bonds are often linked to short-term interest rates, an upward sloping yield curve implies lower debt servicing costs for floaters than for fixed-rate bonds with equal maturities. Floating-rate bonds are mainly demanded by investors like banks that prefer to lend money at variable interest rates. As coupons of floaters are usually adjusted every few months (typically every 6 months), they are only valuable for debt with maturities exceeding the re-fixing time interval. The insurance value for investors which is generated by floaters increases with the maturity of the instrument. Therefore floating-rate bonds are concentrated in the long-term debt market.

To identify the effect of the interest rate structure of debt on macroeconomic risk, one has to determine the factors behind the interest rate dynamics. Theory identifies economic growth and inflation as the main drivers of interest rate movements. Depending

on the type of shock that causes deviations from the trend output, a positive or negative correlation between economic growth, inflation and interest rates can be observed. In order to derive clear-cut results about the influence of the interest-rate structure on macroeconomic risk, one has to differentiate between different types of economic shocks and monetary policy reactions. In the following we discuss a special case of supply and a special case of demand shock to clarify the dynamics at work.

First we consider a negative demand shock scenario in which monetary policy follows a simple Taylor rule that implies expansionary monetary policy. Such a shock implies a positive correlation between growth and interest rates and therefore causes debt servicing costs for variable-interest debt instruments to react procyclically, creating fiscal space for countercyclical manoeuvre and reducing budgetary risk (increasing budgetary insurance).<sup>16</sup> If the demand shocks go hand in hand with a reduction of inflation, the argument also holds for inflation-indexed debt.

Second we look at a cost-push supply shock scenario in which monetary policy is contractionary. In this case variable-interest debt implies relatively high levels of budgetary risk since debt servicing costs increase (act countercyclically). For this type of shock, inflation-indexed debt amplifies budget risk.

The use of variable-interest bonds is widespread in the euro area but shows substantial differences across countries. The share of more than 40% in overall

<sup>15</sup> A large share of variable interest rate debt can lead to substantial problems for monetary policy.

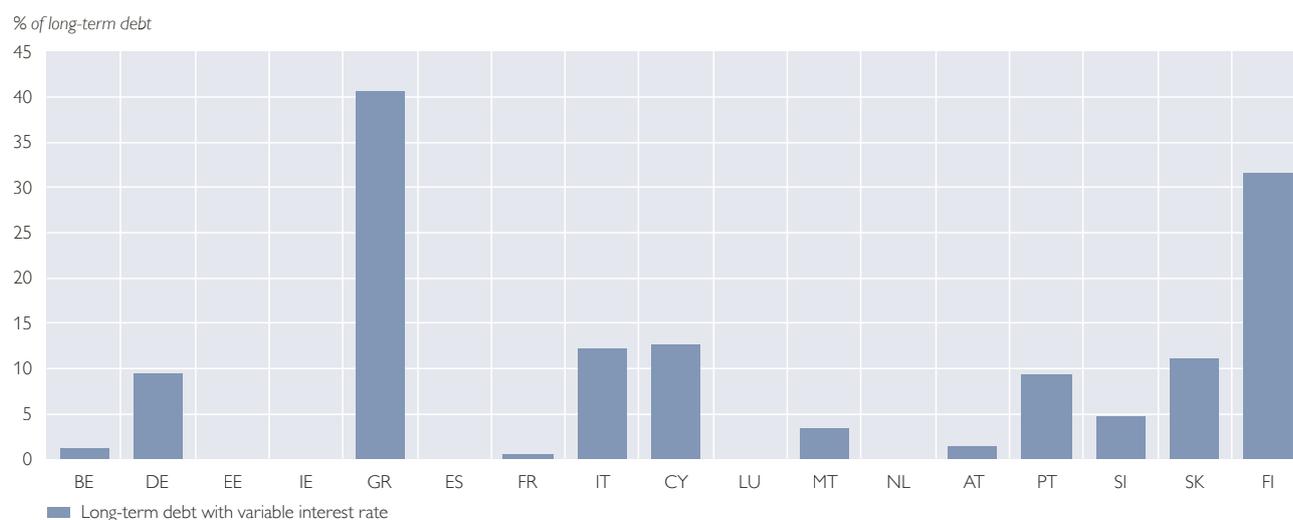
<sup>16</sup> This argument is of course only true if we assume that the country risk of the sovereign is constant and not affected by economic cycles.

Greek long-term debt reflects the recent restructuring of sovereign debt, which included a debt exchange of fixed-rate bonds for variable-interest bonds. Among the other euro area

countries, only the Finish debt portfolio shows a large proportion of total long-term debt (more than 30%) held in the form of variable-interest debt (see chart 3).

Chart 3

### Long-Term General Government Debt with Variable Interest Rates in the Euro Area – 2011



Source: ECB.

Box 1

#### Debt Indexation

*Inflation-indexed, GDP-indexed or commodity price-indexed bonds can be interpreted as floating-rate bonds with special reference indices.*

*In the sovereign debt markets, inflation-indexed bonds became prominent through the issuance of inflation-indexed gilts by the U.K. in 1981. Since then, various other countries (e.g. U.S.A., France, Canada, Australia, Germany, Greece, Hong Kong, Italy, Japan, Sweden, Israel and Iceland) have also issued inflation-indexed debt. Patterns differ since some instruments only index the coupons while others also index the underlying principal. Inflation-indexed bonds can normally be placed on the market at lower debt servicing costs since the inflation risk is transferred from the investor to the government.<sup>1</sup> In addition to the insurance feature of inflation-indexed bonds they additionally serve as anti-inflationary commitment devices for monetary policy.<sup>2</sup> Anti-inflationary credibility can be gained by increasing the share of long-term debt that is indexed to the price level (Calvo, 1988). Countries with low reputation and low credibility in the field of monetary policy can use inflation-indexed bonds to reduce the slope of the yield curve. Membership in currency unions that have price stability as their primary goal goes hand in hand with higher credibility for anti-inflationary policies and reduces the use of inflation-indexed bonds as an insurance device. In such a case, the motive*

<sup>1</sup> Constrained market liquidity for inflation-indexed bonds can lead to a situation of higher debt servicing costs for inflation-indexed bonds than fixed-rate bonds.

<sup>2</sup> However, the emission of inflation-indexed bonds could also reduce the inflation aversion of a country's population. This was the reason behind the ban of inflation-indexation which existed in Germany until EMU membership.

*for diversifying the portfolio in order to attract a large investor base becomes the main motive of inflation-indexed debt issuance.*

*The issuance of inflation-indexed bonds clearly increases market risk, since the government debt servicing costs additionally react to price fluctuations. As a consequence of the price or wage indexation of pension benefits that exists in various OECD countries, pension funds are natural investors seeking inflation protection via inflation-indexed bonds.*

*GDP-indexed bonds, i.e. instruments with cash flows that are linked to economic growth rates, would provide the most efficient and direct protection for budget variations caused by the described demand shock. Despite the fact that GDP-indexed bonds are theoretically very appealing, the implementation of such bonds faces substantial obstacles. While moral hazard problems arising through the implicit incentives of governments to reduce economic growth (Sandleris et al., 2011) and therefore to lower debt servicing costs appear to be solely of theoretical use, the treatment of data revisions due to the lagged realization of output data appears to be substantial and prevents an objective pricing of the instrument. Until today, the obstacles and the lack of a clear-cut investor base for the product have prevented the regular issuance of GDP-indexed bonds. Nevertheless these instruments have found their application in certain debt restructuring arrangements. Argentina, Bulgaria, Costa Rica and Bosnia-Herzegovina have used GDP-indexed bonds in their debt restructurings by linking them to bond exchanges.*

### Currency Denomination

Countries with mature debt markets can issue debt in both domestic and foreign currency. Issuing foreign currency-denominated debt broadens the investor base, and the implied transfer of exchange rate risk from the investor to the government makes such instruments attractive to foreign investors with limited or low risk-taking capacity. This argument is especially relevant for small countries with currencies that have low international reputation. Increasing demand for a debt instrument further implies improved liquidity for the debt instrument. The resulting lower liquidity premiums together with the risk transfer reduce emission yields. Therefore, foreign currency debt trades at substantially lower yields to maturity than domestic debt for countries with devaluation risk. Due to the exchange rate-dependent coupon and principal payments, foreign currency-denominated debt carries substantially amplified market risk for the issuing sovereign.

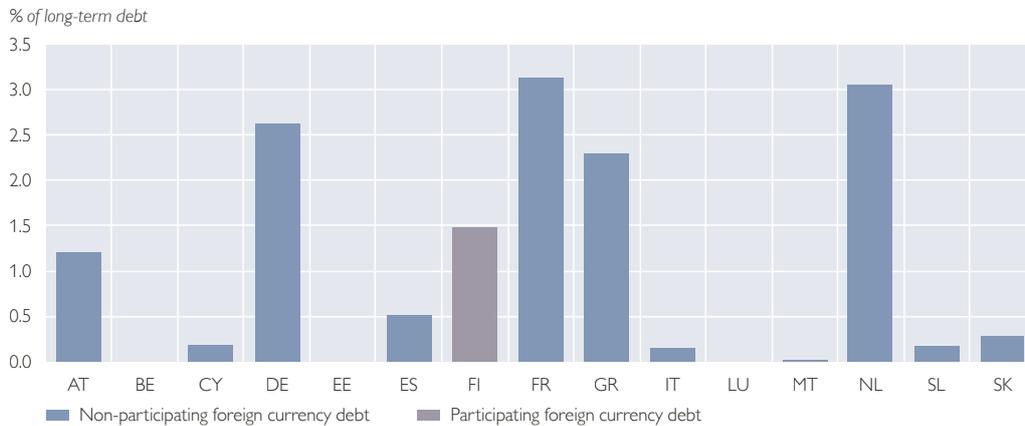
In order to determine the influence of currency denomination for macro-

economic risk, we first have to discuss the correlation between interest rates and exchange rates. If the uncovered interest parity holds, domestic economic booms that lead to higher domestic interest rates imply appreciation expectations for the domestic currency. Debt servicing costs of foreign currency debt therefore react countercyclically. The budgetary risk position of the portfolio implied by shocks that cause local currency depreciations hence increases with the share of foreign currency-denominated debt. The opposite is true for shocks that cause local currency appreciation.

The “fear of floating” literature (Calvo and Reinhart, 2002) discusses the potential of foreign currency debt to serve as a commitment to anti-inflationary policy. Similar to inflation-indexed debt, a large share of foreign currency-denominated debt causes a situation where monetary policy has strong incentives not to cause depreciations by loose policy and thus reduces monetary policy flexibility and fostering anti-inflationary credibility.

Chart 4

### Foreign Currency Denomination of General Government Debt in the Euro Area – 2011



Source: ECB.

In 2011 only a few countries (Germany, France, Greece and the Netherlands) in the euro area had more than 2% of their debt in foreign currencies (see chart 4). Finland is the only country in the euro area with an ERM II participating foreign currency-denominated debt (Danish krone) in its portfolio.

#### Combining Debt Characteristics

By combining different instruments debt managers can tailor the cost-risk profile of the sovereign debt portfolio. The issuance of a wide range of products with the aim of increasing the investor base entails reduced liquidity for each instrument, since the instruments partly serve as substitutes. The lower the liquidity, the higher the liquidity premium, which increases debt servicing costs. In reality, the existing tradeoff between liquidity premiums and the depth of the debt market is the reason why debt management agencies issue a limited variety of debt titles. Strict risk management benchmarks and a focus on a liquidity-enhancing strategy can

create a natural base for the use of financial derivatives. Due to a lack of detailed information, we exclude derivatives from the analysis and do not elaborate on their effect on the characteristics of the debt portfolio characteristics.

#### 3.3 Issuance and Placement Techniques

Debt management agencies can choose from a variety of issuance and placement techniques.<sup>17</sup> The method of placing debt on the primary market is especially relevant for curbing liquidity risk. The various existing distribution channels ensure that a broad investor base is attracted and issuance prices reflect real market values. Addressing the same issue of maximizing liquidity, sovereign debt managers often rely on primary dealers for the placement of their issuances. Primary dealers promote securities and serve as market makers, bid at auctions and buy part of the issued debt. Today, all euro area countries except Germany rely on

<sup>17</sup> For a detailed description of issuance techniques among other institutional aspects see Brandner et al. (2007) or OECD (2012).

the services of primary dealers, which increase the attention of foreign investors via their international distribution channels.

In general, debt can be issued via auctions, syndications<sup>18</sup> or tap issuances.<sup>19</sup> In practice, sovereign debt managers use a combination of all available options in order to maximize liquidity by matching certain investor needs. Syndications have the advantage that liquidity can be ensured via pre-issuance negotiations since this technique is based on over-the-counter (OTC) trades.<sup>20</sup> Especially for small countries with a small investor base or in situations of economic unrest and high uncertainty, syndications can ensure a placement on the market and reduce rollover risk. However, prices negotiated between a few market participants do not necessarily reflect the “true” market rates. In this respect auctions are clearly the most efficient instrument, producing price signals that are determined by the full investor base. At the same time, auctions carry the risk of not fully covered debt issues since demand and price are not prenegotiated. If demand and supply for a certain bond series significantly deviate from those of other bond series, a discontinuous pattern of the term structure can emerge. In such a case, tap issuances can be used to fine-tune the portfolio in order to produce smooth benchmark yield curves. Debt management agencies further have the opportunity to smooth the redemption profile or change the characteristics of the debt portfolio by debt buyback operations.

To increase transparency, debt managers announce their issuance plans well in advance via their issuance calendar. The missing coordination of debt issuances in the past has occasionally caused liquidity problems, especially for small countries. This might be the reason why debt issuance coordination was specifically addressed in the Van Rompuy report “Towards a genuine economic and monetary union” (European Council, 2012).

Further important technical aspects of sovereign debt issuance are the legal clauses of issued debt contracts. The applicable legal jurisdiction and the existence of collective action, negative pledge and cross-default clauses imply substantial differences for the exposure of investors to country default risk. By implementing such clauses or issuing debt under domestic jurisdiction, debt managers can minimize default costs, which imply higher credit risk and higher debt servicing costs.

#### 4 Changes in the Euro Area’s Sovereign Debt Management Funding Strategy

A popular way to identify debt management strategies is to track changes in the gross issuance of debt. However, such an approach does not consider the effect of debt redemptions: an issuance that simply replaces an expiring instrument does not imply a change in the debt management strategy. Net issuance statistics address this issue by adjusting gross values for debt redemptions. Nevertheless, one also has to be careful in the interpreta-

<sup>18</sup> Debt syndication is a process of distributing debt to a consortium of banks, where one or several banks can fulfil the role of the arranger.

<sup>19</sup> The nominal value of an already placed issuance is increased by selling the instrument at the original face value, original maturity and original coupon rate, but at the actual market price.

<sup>20</sup> OTC trades are nonstandard bilateral trades that are performed and settled directly between the contracting parties.

tion of net issuance changes, since they can be driven by overall debt dynamics. Only the relative weight and not the absolute level of debt instruments in the debt portfolio carries information about the employed strategy. Any dynamics of these weights correspond to changes in the debt management funding strategy.

#### **4.1 The Impact of EMU on Sovereign Debt Management Strategies**

The sovereign debt management of euro area countries has been substantially influenced by their membership in Economic and Monetary Union (EMU), which triggered a convergence of debt management strategies. Over the period from 1999 to 2007 the debt portfolio of euro area sovereigns became more homogenous with respect to maturity structure and currency denomination. Nevertheless substantial differences remained.

A significant part of the maturity convergence of euro area countries' debt portfolios was triggered by substantially decreasing long-run interest rates during the 1990s, which flattened the yield curve and led to relative cost advantages of long-run debt issuance. The shift from short-run to long-run instruments was especially strong for Spain, Italy and Greece.

The larger investor base for domestic (euro-denominated) debt allowed countries with smaller debt markets to issue domestic currency debt on markets that did not attract investors before EMU. This was especially the case for illiquid short-run debt markets. The strong increase in the issuance of treasury bills by the Netherlands, Finland and Portugal can be interpreted as a direct consequence. Countries with traditionally low levels of short-run debt like Germany and Austria only

slightly increased their share of short-term debt, further relying on fixed-rate long-term instruments.

Another direct result of the increased investor base was the substantial reduction of the share of debt issued in foreign currency, which decreased to historical lows of less than 1% of total debt.

Interestingly, despite the fact that the credibility of the price stability objective increased for most members of EMU, the issuance of inflation-indexed debt gained in momentum. From 1999 to 2007, the amount of outstanding inflation-indexed bonds – issued by France, Greece, Italy, Germany and Spain – increased from EUR 21 billion to EUR 242 billion. The impressive growth rates can be explained by the wish to broaden the investor base combined with special demand requirements for inflation indexation, especially from pension funds. Nevertheless, the overall amount of floating-rate debt instruments did not increase substantially, since the increase of inflation-indexed debt was offset by the substantial decrease in variable-interest debt instruments.

Due to the increased importance of electronic trading systems and the larger investor base, standardized debt instruments in the form of securities gained importance, leading to a decrease in the reliance on nonmarketable debt financing.

#### **Risk Dynamics**

The substantial change in the structure of debt had various implications for the overall risk position of the euro area's sovereign debt portfolio. Market risk decreased due to lower currency risk and the focus on long-term instruments. The broader investor base increased liquidity in all European bond markets. Bid-ask spreads below

0.05% of the mid quote<sup>21</sup> (ECB, 2007) in 2006 point toward historical lows of liquidity risk.

The share of debt with residual maturity of up to one year, an indicator for rollover risk, was substantially reduced due to the adjustments before entering the common currency area. This trend was prolonged in the first years of monetary union but started to reverse in 2000. By 2007 the share of short-run debt with a residual maturity up to one year had returned to pre-euro era levels of around 22% of total debt. These figures indicate an increase of rollover risk. However, average residual maturity shows the opposite. As shown in Table 1, a short-lasting decrease of the average residual maturity in 2001 and 2002, reflecting mainly the implementation of new short-run bond instruments, was more than offset by a clear and continuous upward trend until 2007. Looking at the whole spectrum of maturities, rollover risk was thus substantially reduced over the period.

The funding strategy of sovereign debt managers in the euro area also affected the insurance of government budgets against macroeconomic shocks. In order to discuss macroeconomic risk dynamics over time we again make use of our stylized demand and supply shock scenarios as defined above.

In the case of the negative demand shock which triggers expansionary monetary policy, the lower share of debt denominated in foreign currency over the period 1999 to 2007 decreased budget risk, while the reduction of the share of variable-interest bonds and the increasing share of long-run debt over the same period increased budget risk.<sup>22</sup> Overall, budget risk implied by the negative demand shock increased due to the dominating effect of the switch to longer maturity.

In the case of the cost-push supply shock, where monetary policy acts contractionary and the uncovered interest parity holds, the decreasing share of foreign currency debt increased budget risk, while the decreasing share

Table 1

### Funding Strategy of Euro Area Sovereign Debt Management

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	<i>% of total debt</i>												
<b>Short-term debt</b>	10.2	9.4	10.3	11.2	11.3	11.0	11.0	10.7	10.8	14.3	15.1	15.2	14.5
<b>Long-term debt</b>	89.8	90.6	89.7	88.8	88.7	89.0	89.0	89.3	89.2	85.7	84.9	84.8	85.5
of which: variable interest rate	10.9	10.1	8.8	8.7	8.2	7.6	7.3	7.1	7.3	8.3	7.4	7.2	8.4
of which: inflation-indexed*	n.a.	0.3	0.5	0.7	1.3	2.2	2.9	3.6	4.5	4.5	4.7	4.7	4.7
<b>Debt denominated in</b>													
local currency	96.9	96.7	97.7	98.0	98.5	98.4	98.3	98.8	99.0	98.6	98.6	98.6	98.1
nonparticipating foreign currency	2.4	2.3	2.0	1.7	1.3	1.4	1.5	1.1	0.8	1.3	1.4	1.3	1.9
<b>Residual maturity below 1 year</b>	18.8	19.3	20.1	22.8	21.5	21.1	21.0	20.9	21.8	25.2	24.4	24.8	23.9
	<i>In years</i>												
<b>Average residual maturity</b>	5.9	5.9	5.8	5.7	5.9	6.1	6.6	6.8	6.9	6.8	6.6	6.7	6.7

Source: ECB, \*OECD.

<sup>21</sup> The price between the lowest price the sellers of the bond are willing to accept (ask price) and the highest price the buyers of a bond are willing to pay (bid price).

<sup>22</sup> This is of course only true if refinancing costs are assumed to react countercyclically.

of interest rate-dependent debt and the higher share of long-term debt decreased budget risk. Since the increase in the share of floating debt instruments for the euro area was almost identical with the decrease in the share of foreign currency debt, the overall change of budget risk was again dominated by the strong change in the maturity profile. Overall, the dynamics indicate that budget risk due to cost-push supply shocks decreased over the period from 1999 to 2007.

#### **4.2 The Impact of the Global Crisis on Sovereign Debt Management Strategies**

In the aftermath of the collapse of Lehman Brothers in September 2008, European interbank markets dried up, causing substantial liquidity problems. To prevent a complete breakdown of the interbank markets, central banks reacted with liquidity-providing operations and governments created rescue packages for the financial sector. Stimulus packages together with banking rescue funds, lower government revenues and higher government expenditure due to the automatic stabilizers created the need for governments to raise additional funds on short notice.

The large increase of government debt together with the increase of contingent liabilities due to potential future bank bailouts and the materialization of substantial structural problems of some member states triggered a new regime for euro area sovereign debt markets. For a wide range of euro area countries risk premiums of sovereign assets substantially increased. The new regime of “risky” euro area sovereign debt caused substantial country heterogeneities in the demand for sovereign debt. Countries with high credit risk had no access to long-term financing and were forced into short-term debt

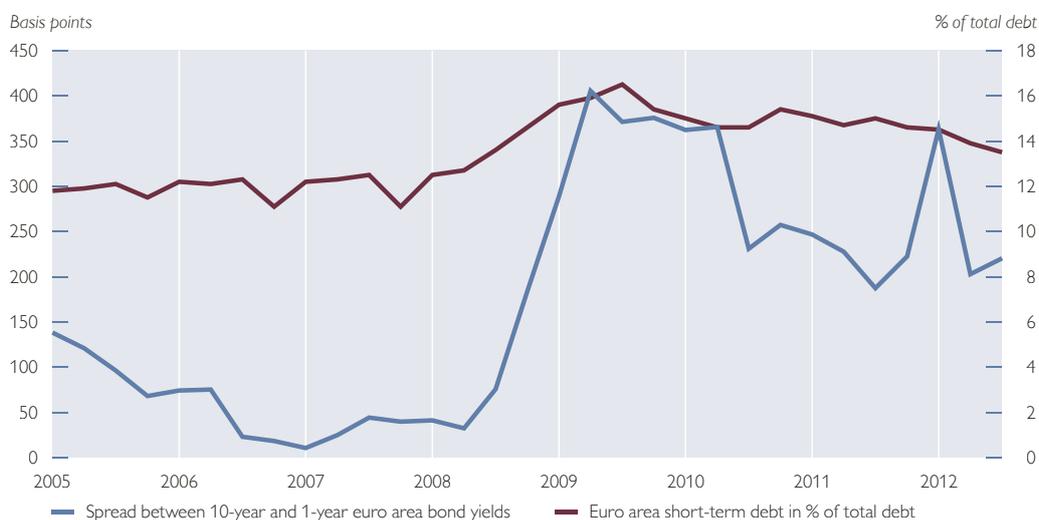
financing at extraordinarily high yields. Overall, the share of euro area short-term debt constantly increased until the second quarter of 2009, when it peaked at a level of 16.5% of total debt. Following historical patterns, long-term securities issuance was concentrated in the fixed-coupon segment. In the second half of 2008, and especially in 2009 and 2010, market tension and large uncertainties substantially increased bid-ask spreads for many euro area countries, implying severe problems to place debt.

The large uncertainties and the increase in overall risk aversion of market participants triggered an increased demand for safe assets, a so-called “flight to quality.” Among the euro area countries with low credit risk, especially Germany, but to a lesser extent also the Netherlands, Finland, France and Austria experienced large demand for their sovereign debt. This, together with expectations about low future economic growth, resulted in historical lows of their benchmark yields. Nevertheless, even for these countries small changes in economic signals caused strong and volatile market reactions, which underlined the strong interlinkages between euro area member states.

Due to the emerging euro area country heterogeneity in the demand for debt instruments and debt servicing costs, euro area member states’ debt management funding strategies faced different challenges. Countries with low credit risk mainly focused on cost minimization and increased their reliance on short-term debt issuance in order to realize relative cost advantages that arose due to the strong steepening of the yield curve (see chart 5).

While the countries with low credit risk premiums further focused on cost minimization and continued to rely more heavily on short-term debt, coun-

Chart 5

**Euro Area Funding Strategy – Maturity Choice and the Slope of the Yield Curve**

Source: ECB, Eurostat.

tries with elevated levels of credit risk (e.g. Spain) constantly tried to reduce the high shares of short-term debt over time. This development reflects the fact that especially for the group of high credit risk member states the avoidance of rollover risk gained in importance. Among the low credit risk member states Austria appears to be an outlier due to its very low shares of short-term debt. Despite a doubling of short-term debt from 2007 to 2008, in 2011 only about 3% of total debt were held in the form of short-term debt.<sup>23</sup> This strong persistent focus toward long-term financing could be interpreted as a strong preference for insurance against potential credit risk increases in the future.

The share of variable-interest and inflation-indexed debt for the euro area remained broadly unchanged, while the share of foreign currency-denominated

debt increased from 0.8% of total debt in 2007 to 1.9% of total debt by the end of 2011.

In addition to changes in the funding strategy, the majority of debt management agencies in the euro area responded to the sovereign debt crisis with increased flexibility in the issuance calendar and, to some extent, also in the range of instruments and issuance techniques. In various member states, sovereign debt managers used specific techniques to improve the liquidity of the secondary market. Primary dealers were granted concessions, which took the form of second-stage non-competitive auctions and/or exclusive rights or preferences in concluding individual transactions.<sup>24</sup> As to market making, minimum bid sizes and active participation on the secondary market became requirements.

Throughout the euro area syndicated bond issuances became more popular

<sup>23</sup> We do not consider the case of Ireland, which also shows very low shares of short-term debt, since this development is solely due to the recent debt restructuring.

<sup>24</sup> For a detailed description of changes in the primary dealer requirements during the crisis see Blommestein (2009) and OECD (2012).

from 2007 to 2009, as these eased the issuance of large debt tranches and tended to reduce government dependency on highly volatile markets. In 2009, syndicated issuances stood at about 16% of total bond issuance across the euro area.

### Risk Dynamics

The new focus of sovereign debt management on short-term financing and the increased importance of foreign currency debt implied substantially increased market risk. The share of debt with residual maturity up to one year increased further from 22% of total debt in 2007 to 25% of total debt in 2008 and stabilized at these new highs. Moreover, as can be seen in Table 1, the average residual maturity of debt decreased slightly from 6.9 years in 2007 to 6.7 years in 2011. Both figures indicate increased rollover risk.

Macroeconomic risk implied in the debt portfolio also reacted to the shift toward more short-term financing. Our stylized demand shock scenario implies that the issuance of debt with shorter maturities increased the insurance of the government budget and decreased budgetary risk. This is of course only true if we again assume that refinancing cost react procyclically. If the demand shock led to soaring country risk premiums and increasing refinancing costs, the shift toward shorter maturities would imply an increase of budgetary risk.

In the case of our stylized cost-push supply shock, similar to the case of countercyclical refinancing costs, the stronger focus on short-term issuance decreased the level of insurance offered by the debt portfolio and increased budgetary risk.

## 5 Conclusions

Sovereign debt management funding strategies imply various forms of risk. At the same time appropriate strategies can (partly) insure government budgets against certain macroeconomic shocks. The latter point is typically not considered by sovereign debt management agencies, which tend to focus on micro portfolio optimization aspects.

This paper analyzed the different forms of risk implied by the composition of the sovereign debt portfolio and discussed methods for their evaluation. By determining the risk properties of existing debt management instruments we underlined the potential of certain debt management instruments to insure the budget against stylized demand and supply shocks. We conclude that, from an overall macroeconomic perspective, debt management agencies should use a broader definition of risk to guide their portfolio choices.

Debt management strategies in euro area countries were substantially influenced by the creation of the euro. Increasing market liquidity and the focus on cost minimization, which exploited the relative cost advantages in issuing long-term debt instruments, led to an increase in average residual maturity and, in general, to a convergence of national debt portfolio structures. Furthermore, inflation-indexed bonds became part of some member states' debt portfolios, while the role of variable-rate long-term debt decreased.

By contrast, in the wake of the financial crisis, the loss of the risk-free status for euro area sovereign assets and the substantial relative cost advantages due to a steepening of the yield curve led to an increasing importance of short-term debt in euro area funding strategies. This caused an increase in rollover risk and market risk of the euro area debt portfolio.

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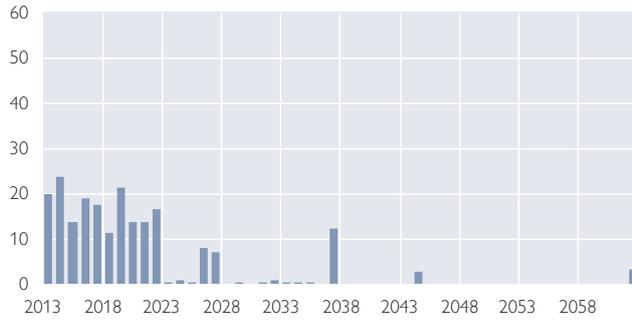
Appendix

Chart A1

Sovereign Debt Redemption Profile of Selected Euro Area Countries

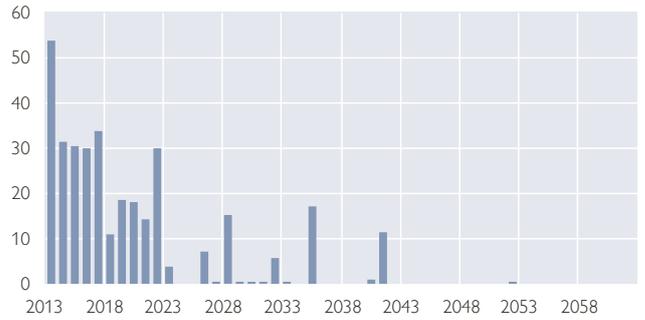
**Austria**

EUR billion



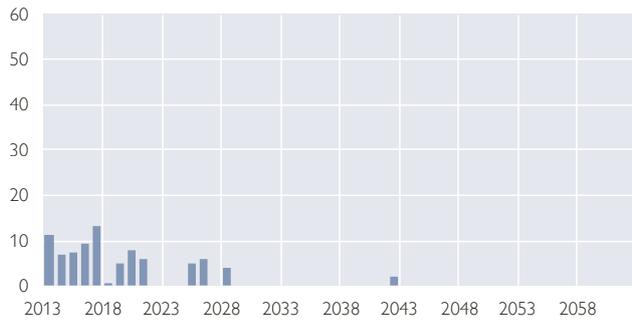
**Belgium**

EUR billion



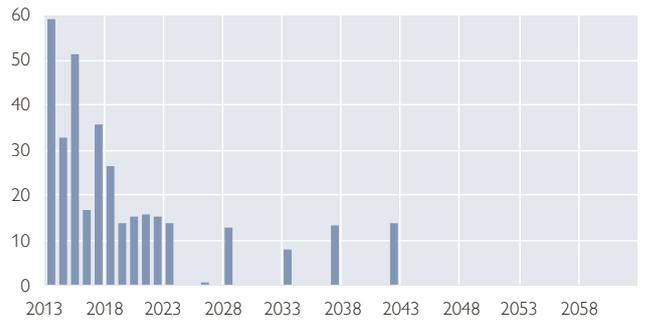
**Finland**

EUR billion



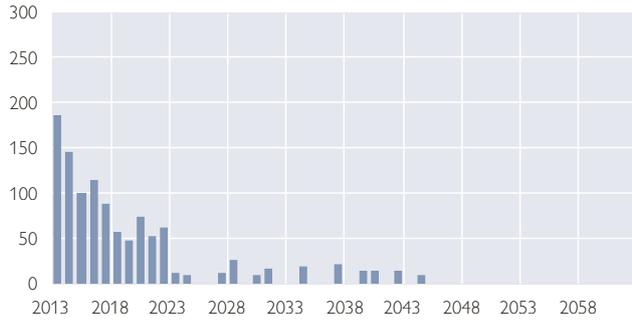
**Netherlands**

EUR billion



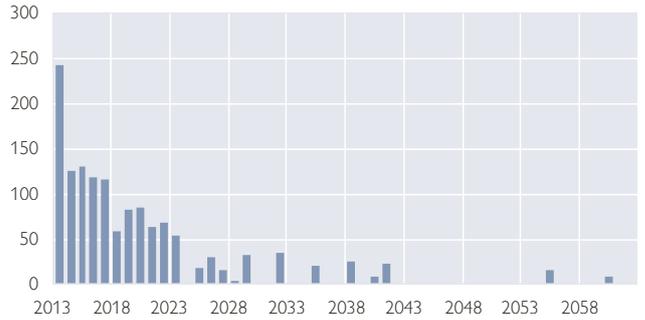
**Germany**

EUR billion



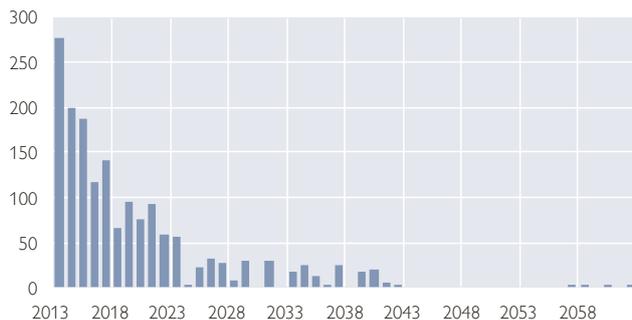
**France**

EUR billion



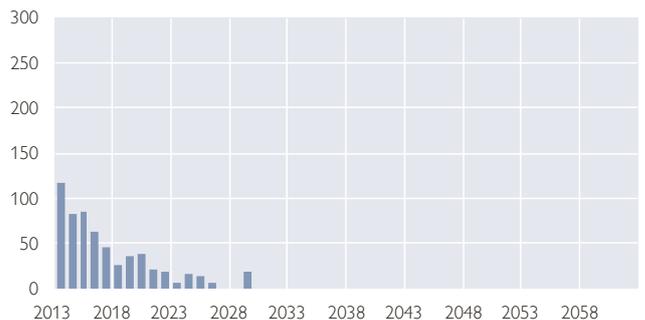
**Italy**

EUR billion



**Spain**

EUR billion

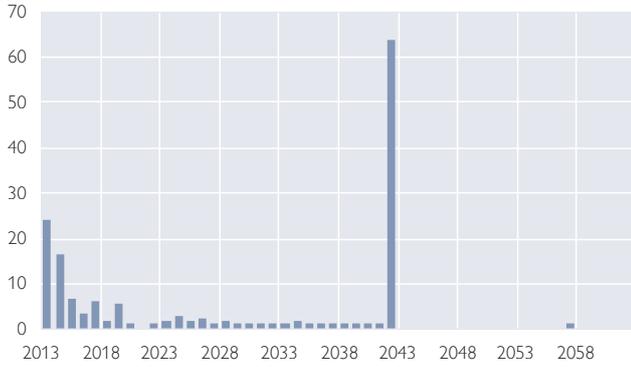


Source: Thomson Reuters.

**Sovereign Debt Redemption Profile of Countries Under Rescue Programs**

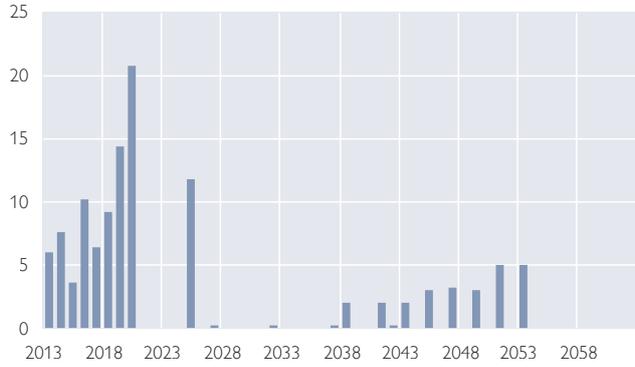
**Greece**

EUR billion



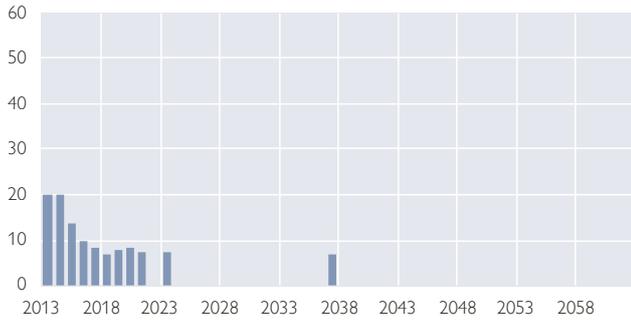
**Ireland**

EUR billion



**Portugal**

EUR billion



Source: Thomson Reuters.

# An Export-Based Measure of Competitiveness

*Unit labor cost (ULC) developments have been receiving increased attention from policymakers throughout the euro area, as adverse developments in price competitiveness are commonly seen as one of the causes of the ongoing sovereign debt crisis in the euro area. Yet empirical results are often ambiguous on the link between ULC developments and export performance. This widely examined empirical conundrum, often referred to as “Kaldor paradox,” naturally raises the question whether commonly used measures of ULC growth (such as total economy ULC) are a meaningful measure of mounting imbalances and persistent losses of trade competitiveness. Therefore, we propose a new ULC growth index that exploits disaggregated sectoral information and focuses on export-relevant sectors only. This trade-weighted ULC index is shown to have a substantially higher explanatory power for export growth than traditional ULC measures.*

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*JEL classification: F14, J30*

*Keywords: unit labor costs, competitiveness, export growth*

One of the main lessons from the global financial crisis was that the European monitoring and coordination procedures were inadequate to prevent the buildup of both internal and external imbalances. On the one hand, the existing mechanisms for preventing and correcting fiscal imbalances, such as the Stability and Growth Pact and the Excessive Deficit Procedure, proved to be insufficient. On the other hand, there were no mechanisms for detecting and preventing imbalances in other macroeconomic areas, such as external trade, asset markets and the financial system.

The examples of Spain or Ireland illustrate this lack of appropriate monitoring devices: Both countries were judged to be model cases of fiscal consolidation with a solid catching-up process. Ireland managed to reduce its public debt-to-GDP ratio from more than 80% in the mid-1990s to 25% in 2006/07, while Spain halved its debt ratio from almost 70% to 35% in the same period. Today we know that much of this miracle was a by-product of

domestic demand booms and the bubble in the housing market resulting from the rapid interest rate decline and capital inflows after monetary integration. Both in Spain and Ireland, residential construction accounted for about 11% of GDP on average between 2000 and 2008, as compared to only 5% or 6% in German, France or Italy. Data on credit growth, housing market dynamics or current account deficits may have given early warning signals but were not yet incorporated in existing surveillance procedures.

Excessive imbalances, however, have contributed considerably to the depth and persistence of the crisis. The necessary deleveraging of the private, corporate and public sectors aggravated the economic slump. In several countries the burst of house price bubbles and the overindebtedness of the private sector weighed heavily on the banking sector, and ultimately also on the public sector due to bank bailouts. One of the main lessons from the crisis therefore was that monitoring fiscal developments is not sufficient to prevent the buildup of

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Kirsten Lommatzsch,  
Deutsche Bundesbank

excessive internal and external imbalances but needs to be embedded in a broader monitoring framework.

In 2011 the European Commission initiated the Macroeconomic Imbalance Procedure (MIP). The annual starting point of the MIP is an Alert Mechanism Report (AMR), which provides a snapshot of recent developments based on a scoreboard of indicators and predefined threshold values, covering current account balances, FDI, real effective exchange rates, export market shares, unit labor cost and house price developments, private and public debt, unemployment and financial sector liabilities. The AMR thus serves as a filter which enables policymakers to identify countries for which an in-depth analysis is deemed necessary. The purpose of this analysis is to establish whether imbalances are considered excessive, which would then trigger further steps such as recommendations, action plans and eventually financial sanctions.<sup>2</sup>

The development of unit labor costs (ULCs) plays a central role both in the AMR and the MIP.<sup>3</sup> ULC developments are considered to be good indicators for a country's competitiveness gains or losses, as they provide an indirect way of assessing export prices. Along this reasoning, excessive ULC growth, especially in relation to the most important trading partners, can give early signals about widening external deficits and a permanent loss in market shares. Similarly ULC developments are assumed to play a crucial role in the narrowing of external balances after the crisis.

While this reasoning seems consistent with basic economic theory, em-

pirical results are less clear about the link between ULC developments and export performance, which is often referred to as the “Kaldor paradox” or – more recently – the “Spanish paradox” (see, for instance, Kaldor, 1978; Antràs Puchal et al., 2010). This widely examined empirical conundrum naturally raises the question whether commonly used measures of ULC growth are a meaningful measure of mounting imbalances and persistent losses of trade competitiveness.

In this study, we reassess the link between ULC developments and external imbalances for a set of euro area countries. Changes in ULC developments may in principle impact on external imbalances; on the export side, this may happen via gains or losses of price competitiveness, on the import side, this may occur via income effects and shifts in relative prices. In this study we are more interested in the direct effects of ULC developments on price competitiveness and therefore focus on the export side, i.e. we link ULC developments to export growth. Our analysis confirms that export dynamics are largely disconnected from total economy ULC developments. We propose a new ULC growth index that exploits disaggregated sectoral information and focuses on export-relevant sectors. Our “trade-weighted ULC index” (TWULC index) is shown to have a substantially higher explanatory power for export growth than traditional ULC measures.

Section 1 focuses on the theoretical background and illustrates the weak link between ULC developments and

<sup>2</sup> For details see the European Commission page on the MIP.

<sup>3</sup> The specific ULC figure entering the scoreboard is the percentage change in nominal ULC, measured as compensation per employee to real GDP per person employed, averaged over three years. In the course of the in-depth analysis the European Commission may take into account further wage cost-related measures such as labor productivity growth, nominal ULC growth over ten years, effective ULC growth versus the euro area and employment growth.

export performance. Section 2 describes our dataset and introduces an alternative measure of cost competitiveness. Section 3 shows some empirical results for our trade-weighted ULC index, and section 4 concludes.

## 1 Theoretical Background

### 1.1 Total Unit Labor Costs As an Imperfect Measure of Competitiveness

Mainstream explanations for the pre-crisis loss of competitiveness of periphery countries such as Greece, Ireland, Portugal or Spain are commonly based on interest rate convergence across euro area countries following monetary unification, thanks to which countries benefited from a marked decline in interest rates. Favorable financing conditions and ample credit supply provided the ground for domestically driven growth. In some countries (e.g. Spain, Ireland) this also contributed to a construction boom and a housing bubble. Some argue that the domestic demand boom coincided with wage growth that was only partially matched by corresponding productivity gains. As a consequence, ULC growth increased rapidly, not only in the domestically oriented sectors but across the economy as a whole, due to wage growth spill-overs, which harmed countries' competitiveness. The subsequent loss of market share was thus – together with vivid import demand – responsible for the widening current account deficits in periphery countries. Based on this line of arguments, external rebalancing would be based on both depressed local demand and the recov-

ery of competitiveness after wage restraint.

At first sight, charts 1 and 2 seem to support such an interpretation. For these charts we group countries into three subgroups according to their respective ULC growth rates and show the unweighted averages for each country group. The five countries with the highest rates of ULC growth between 2000 and 2008/09 – Ireland, Greece, Spain, Italy and Portugal (“periphery”)<sup>4</sup> – experienced a sharp correction in ULCs after the crisis. The only exception is Italy, where productivity growth continues to be weak and thus prevents a ULC correction in spite of recent wage moderation. This pattern is mirrored by widening current account deficits, which started to narrow only with the onset of the global financial crisis. Chart 1 would suggest that the marked decline in current account deficits in recent years was the result of the gain in competitiveness related to the correction in ULC trends. But declining wages and layoffs also have led to a collapse of import demand. This appears to have been the primary driver of declining external deficits. Furthermore ULC adjustments were to a large extent the result of the loss of low-productivity jobs, especially in the construction sector,<sup>5</sup> just as the past housing boom had promoted low-productivity jobs and thus boosted ULC growth.

In the two countries with the lowest ULC growth in that period – Austria and Germany (“core”) – ULC growth was very low or even negative (Germany) until 2007, then acceler-

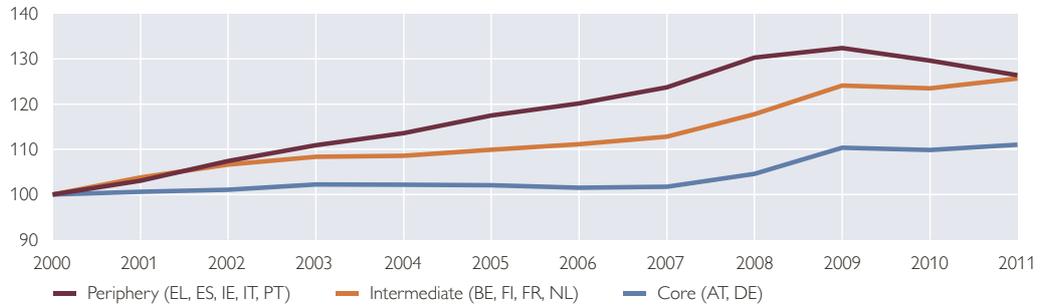
<sup>4</sup> A referee recommended that we use “neutral” labels for the groups instead of those we apply in this study. However, we do not intend to express the hegemony of a specific group of countries but exclusively derive the labels from the development of unit labor costs.

<sup>5</sup> O'Brien (2011) estimates that about half of the decline in business sector ULCs in Ireland is the result of compositional effects when low-productivity workers are laid off.

Chart 1

### Unit Labor Costs

2000=100; unweighted averages within country groups



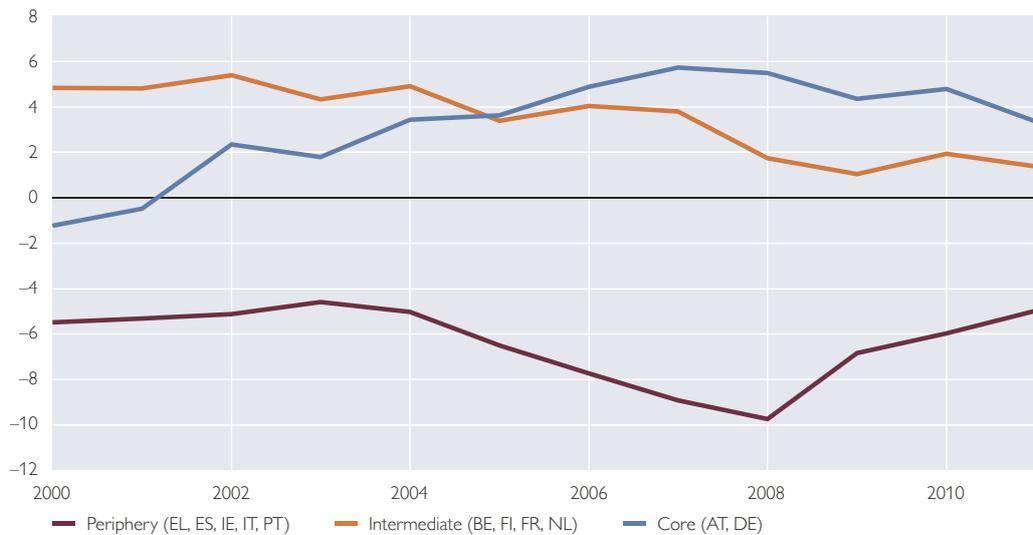
Source: Eurostat.

Note: The data for 2011 do not include Greece.

Chart 2

### Current Account Balances

% of GDP; unweighted averages within country groups



Source: European Commission (AMECO database).

ated, slowed down a bit in the course of the crisis and continued to increase dynamically in recent years. Both countries experienced positive and widening current account positions, a trend that only reversed in the years following the peak of the crisis. The last group – Belgium, Finland, France and the Netherlands (“intermediate”) – also experienced rapid ULC growth, but at less dynamic rate than the periphery

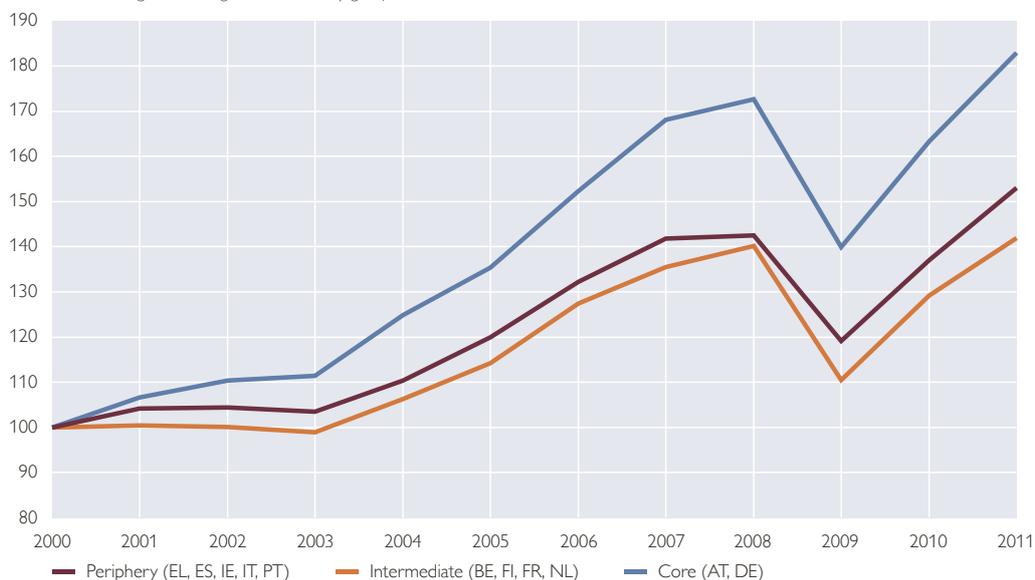
countries. Their positive current account surpluses contracted steadily as their competitive positions weakened; in France the balance has actually been negative since 2005. This pattern did not reverse permanently after the global financial and economic crisis.

Overall, charts 1 and 2 would suggest that ULC developments have a central role in explaining current account imbalances and also in shaping

Chart 3

## Nominal Exports

2000=100; unweighted averages within country groups



Source: Eurostat.

the rebalancing process. While restrained wage growth supported competitiveness in Germany or Austria, wage growth and/or modest productivity growth in periphery countries damaged the attractiveness of their products on the European export market. We would thus expect a disappointing export performance in the periphery, especially as compared to Germany and Austria. Data on export performance, however, only partly confirm this line of arguments.

Chart 3 shows the development of real exports of goods and services over the last decade, again as unweighted averages of the subgroups. It confirms that exports grew dynamically over the observation period in Austria and Germany. The periphery actually outperformed the intermediate group despite their much stronger ULC growth rates.

This suggests that ULC developments only weakly affect the export

performance or export market shares. This is not a new observation; Kaldor (1978) found that the fastest-growing economies of the post-war period also experienced faster ULC growth, and vice versa. According to the Kaldor paradox, there is thus no correlation, or even a (weak) positive correlation, between ULC developments and GDP growth, export growth or export market shares.

### 1.2 The Missing Link?

The literature mentions several potential reasons why developments in ULC and export performance may be disconnected:

1. Nonprice factors such as quality, tastes, sales networks or the business environment may be more relevant for the export performance of a country than its export price structure (ECB, 2012).
2. Common shocks are the main driver of export performance whereas cost

competitiveness is only of minor importance (ECB, 2012). Crespo Rodríguez and Segura Cayuela (2012) for example estimate that the real exchange rate only explains about 10% of the variance in exports of industrial countries while world trade developments explain about 80%.

3. The internationalization of production has driven up the import content of exports and substantially lowered the domestic contribution to the final sales price, which would largely depend on ULCs. Globalization may thus have reshaped the link between cost factors and trade performance (Crespo Rodríguez and Segura Cayuela, 2012). The newly published WTO/OECD TiVA (Trade in Value Added) database is the first harmonized attempt to extract the domestic value added of exports for a broad set of countries. Especially for small and open economies the exports and value added of exports typically deviate substantially.
4. Overall ULC developments may be of relevance only as far as they deviate substantially from those of the most important trade competitors. Investigating relative ULC measures such as the real effective exchange rate (REER), either based on inflation or on ULC differentials, may thus be more indicative for explaining the export performance of a country.
5. Finally, the composition of export markets is relevant. Export industries may cater to more dynamic or already saturated markets.
6. Only a fraction of the production of goods and services is tradable. Wage and productivity developments in the closed sector may deviate substantially from those in the open sector. This relates both to the different level of competitive pressure

across sectors and diverging productivity patterns. Measures of economy-wide ULC growth may be dominated by developments in the closed sector and thus be an imperfect indicator for the export competitiveness of a country.

While there is ample literature on the first five hypotheses the last issue has typically been investigated for single countries only. We argue, however, that differentiating between ULC developments in the domestic industries and those in the export-oriented sector is crucial for understanding the sources of current account imbalances of European countries and for assessing the durability of past, and the need for further, ULC adjustments to restore competitiveness in countries with external deficits. A ULC measure that more closely focuses on export-oriented industries may furthermore have a higher explanatory power for export growth or the change in export market shares.

While typically wage trends of different industries are rather similar within a given country due to spillover effects, productivity trends may be quite different. According to the Balassa-Samuelson hypothesis (Balassa, 1964; Samuelson, 1964), productivity growth differentials between the tradable and nontradable sector are going to be largest in catching-up economies. Thus, we could also expect large ULC growth differentials across sectors in countries of the periphery. With booming domestic demand, resources and production are shifted from the tradable to the nontradable sectors, putting further downward pressure on total factor productivity, thereby accelerating total ULC growth while the external sector might remain competitive.

Recent literature using micro-level data (András Puchal et al., 2010) finds

that exporting firms are generally larger, more innovative and thus more productive than firms that do not export.<sup>6</sup> The causality appears to go mainly in the direction of only more efficient and productive firms venturing into exporting because of high fixed costs of exporting. But there is also evidence for “learning by exporting” effects. These productivity differentials may lead to an aggregation bias if large performing firms versus small underperforming firms enter aggregate ULC figures with weights that differ from their relative share in total exports. This line of argument suggests focusing ULC measures on those industries most relevant for the export sector. This is the approach we follow in the next section.

## 2 Data and Methods

### 2.1 Causes and Consequences of Large Sectoral Differences in ULC Developments

The MIP scoreboard defines unit labor costs as “the ratio of nominal compensation per employee to real GDP per person employed” (European Commission 2011, p. 9), which coincides with the definition of the OECD (2007). The related variables are consequently derived from aggregate data lumping together developments in the trade-exposed and nontrade-exposed sectors of the economy. A broad approach toward deriving a ULC measure that reflects export sector developments more closely is to focus on the manufacturing sector only.<sup>7</sup> Several data sources (e.g. Eurostat, AMECO, ECB and OECD databases) provide a rough distinction between ULC developments

in manufacturing, agriculture, construction and some other sectors, in most cases at quarterly frequency. Some of these databases have the advantage of providing close-to-real-time data or even forecasts, which makes them suitable for policy purposes. But even this more detailed measure mixes very heterogeneous sectors.

However, as explained above, recent evidence demonstrates that nonconsideration of the deeper sectoral dimension of an economy can lead to misguided conclusions (Bechert et al., 2012). Kahn (1998) argues that different sectors might have systematically different wage-setting schedules. It is possible that one sector is bargaining for efficiency wages while wage growth in the other sector is constrained e.g. by pressures of competitiveness. This finding is corroborated by the fact that wage-setting in the trade-exposed sector has become increasingly interdependent within the EU (Traxler et al. 2008; Traxler and Brandl, 2009). Therefore wage developments in the export-oriented industry and in the sheltered sector of an economy might be structurally different. Thus aggregate ULC variables could be a poor indicator for the international competitiveness of the export industry of an economy.

We therefore start from the hypothesis that a further disaggregation at the sectoral level reveals important information about the true development of competitiveness in the export sector. For this reason we propose a sector-specific export-weighted unit labor cost measure. Even though this implies that we have to use data with long publication lags, our exercise with

<sup>6</sup> Barba Navaretti et al. (2011) estimate that Spanish exports could be about one-fourth higher if Spain had an industrial structure and a firm size distribution similar to that of Germany.

<sup>7</sup> Another sector relevant for exports would be agriculture, where prices are highly subsidized and regulated (CAP). This decouples price and thus ULC developments in this sector from export patterns (Ferrucci et al., 2010).

pre-crisis data reveals the importance of making such disaggregated data available for all euro area countries and with shorter publication delays.

## 2.2 Data on Sectoral Unit Labor Costs

Sectoral labor market data on an annual basis for most euro area countries are only available from the EU KLEMS Growth and Productivity Accounts, the World Input Output Database (WIOD) and the OECD Structural Analysis Database (STAN). While the KLEMS database is updated only infrequently and the WIOD project has been discontinued, the OECD STAN database (Rev. 3) has the advantage of being updated regularly and of covering all 12 original euro area countries. It provides data on unit labor costs, labor compensation, value added, employment, imports and exports, all broken down by industry at the two-digit ISIC level; i.e. it distinguishes between manufacturing subsectors such as food products and beverages, tobacco products, textiles, wood and products of wood and cork etc.<sup>8</sup>

Data range back to 1970 in some cases but come with long publication lags. Some countries have published data up to 2009, but observations are missing for many economies, in particular for the more recent years. Any measure based on these sectoral data would therefore not be suitable for

inclusion into an extended set of scoreboard indicators because of the long publication lags in some countries. However this article may contribute to further efforts to provide such data with shorter publication lags.<sup>9</sup> The data limitations also imply that we can investigate pre-crisis developments but not the post-crisis rebalancing process. Due to a lack of sufficient data for real value added for Ireland we also needed to exclude this country from the analysis so that we are left with a set of 11 countries.<sup>10</sup>

## 2.3 An Export-Based Measure of ULC Growth

As explained above, total ULC measures might be highly dominated by nontradable services and the construction sector, as is the case, for instance, in Spain and Ireland. It should not be surprising that the correlation between total ULC (TULC) growth and export growth is only weak, as hypothesized by the “Kaldor paradox.”

Therefore, we construct an alternative measure of ULC growth that focuses on those sectors that are most relevant for exports. More specifically, we reweight ULC developments in the manufacturing subsectors according to their relative importance within the export basket of a country. The trade-weighted ULC index (TWULC) is then calculated as:

<sup>8</sup> Other examples of studies using the OECD STAN database for similar investigations are Lewney *et al.* (2012) and Carlin *et al.* (2001).

<sup>9</sup> In 2012 the OECD published the first set of STAN Rev. 4 data, which will subsequently substitute the STAN Rev. 3. The new STAN Rev. 4 is based on the sectoral disaggregation of the ISIC 4. Thus disaggregated sectors differ with respect to the STAN Rev. 3. Currently the STAN Rev. 4 covers some countries up to 2011 and would therefore be more suitable for the real-time analysis of economic imbalances and the rebalancing process since the crisis. Unfortunately, however, STAN Rev. 4 only covered 8 euro area countries and only one periphery country (Italy) at the time of writing. More countries are going to be added, but for the moment we need to stick to STAN Rev. 3.

<sup>10</sup> One drawback of the OECD STAN database is that it does not cover the service sector. Trade of services, however, is of high and increasing relevance. The newly available Trade in Value Added (TiVA) database, that traces the value added of countries and sectors for final exports, shows the importance of services as input factors for export goods. Repeating our exercise with the TiVA database would be an interesting future extension of our research.

$$TWULC^k = \sum_{i=1}^n ulc_i^k \cdot w_i^k$$

whereby

$$ulc_i^k = comp_i^k / va_i^k$$

and

$$w_i^k = x_i^k / X^k \text{ with } X^k = \sum_{i=1}^n x_i^k$$

where  $k$  denotes the country and  $i$  is one of  $n$  sectors. We use a total of 10 sectors spanning the entire manufacturing industry at the 1½-digit level according to the ISIC classification system rev. 3.1.<sup>11</sup> ULC is computed as nominal labor compensation of employees (*comp*) divided by real value added based on the output of total employment (*va*). A sector  $k$  receives a higher weight in our TWULC measure if it has a high share within the country’s export portfolio. This contrasts with the construction of TULC, where each sector is implicitly weighted by value added.

### 3 Empirical Results

#### 3.1 Illustration: The Spanish Case

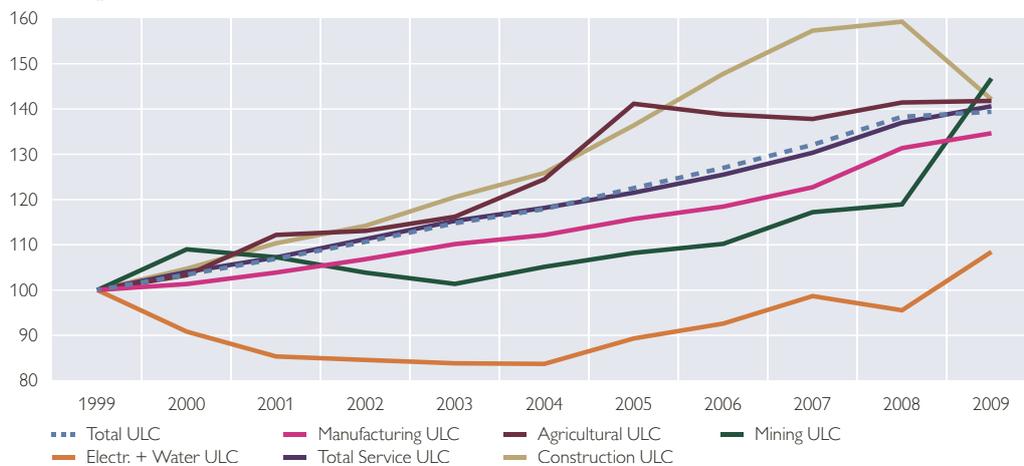
As argued above, Spain is a model case for the disconnection between total economy ULC figures and export performance. We will thus show the importance of investigating sectoral figures as well as the advantage of our new measure for the Spanish economy.

Chart 4 evidences how ULC developments may deviate substantially across sectors. More specifically, the chart illustrates that total ULC growth is to a large extent driven by services ULC growth. ULC dynamics in the very export-oriented manufacturing sector are far more modest over the observation period. The chart also highlights the peculiar pattern of the booming construction sector with very high ULC growth in the pre-crisis years and a sharp contraction since. Overall, we may conclude that an economy-wide ULC measure may be misleading for investigating the export performance of a country.

Chart 4

#### Spain

Annual change; 1999=100



Source: OECD (STAN database).

<sup>11</sup> See <http://unstats.un.org/unsd/cr/registry/regst.asp?CI=17> for a detailed description of this classification system. The TWULC is based on the following subsectoral aggregates: 15–16, 17–19, 20, 21–22, 23–25, 26, 27–28, 29–33, 34–35 and 36–37.

The last country chart in chart 5 applies our new measure TWULC to the Spanish economy and shows substantial differences between labor costs of the total economy (TULC) and those of the manufacturing sector (MULC). In fact, ULC growth in the Spanish manufacturing sector was lower than in the total economy. This fits the interpretation that excessive wage dynamics are primarily related to the blown-up domestic industry and especially the construction sector. When focusing on those manufacturing sectors that are most relevant for external trade, how-

ever, ULC growth is even lower, in line with the hypothesis that the export sector is dominated by a relatively small number of large and highly productive firms very exposed to international competition in highly contested markets, such as the automobile sector.

### 3.2 Cross-Country Overview

When extending this analysis to the remaining countries, we observe a similar pattern as in the Spanish case for most economies: manufacturing ULC growth is typically smaller than total ULC growth. For Italy, however, the

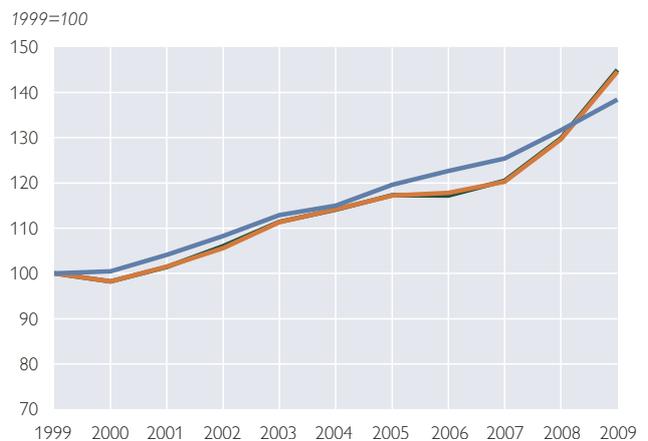
Chart 5

#### Development of Unit Labor Cost Measures: Periphery Group

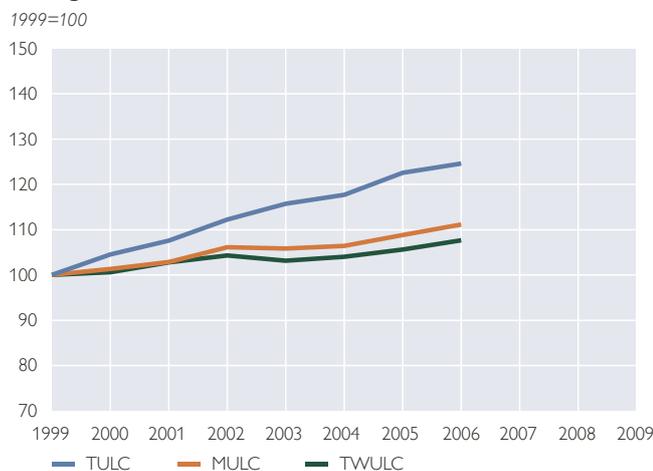
##### Greece



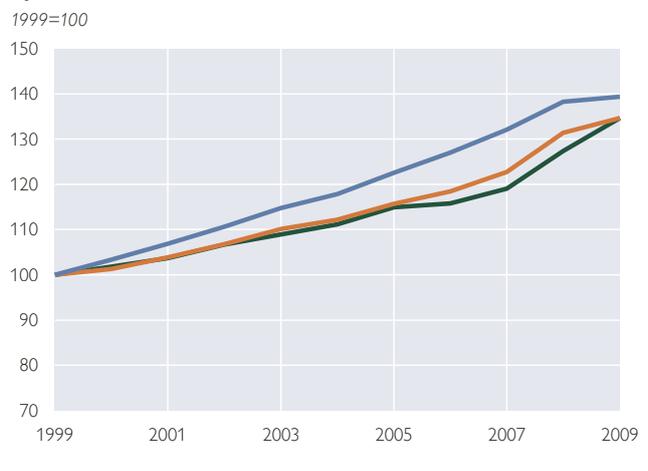
##### Italy



##### Portugal



##### Spain



Source: OECD (STAN database).

difference is quite small. Interestingly, Greece and Luxemburg are exceptions, where the relationship between MULC and TULC even reverses in certain periods. This may relate to the importance of services in both countries (tourism in the case of Greece and financial services in the case of Luxemburg).

In general, while MULC growth was smaller than TULC growth in most economies, the periphery (chart 5) nevertheless experienced a rapid growth in manufacturing ULC, which, according to economic theory, might harm those countries' exports substantially. In Portugal, on the contrary, MULC growth was more modest, which may reflect the importance of the domestic textile industry (23% of total exports), a sector where international price competition is likely to be stronger than in the case of high-tech products.

In the intermediate group (chart 6), where we also observe substantial growth rates of TULC, manufacturing ULC increased by far less in Belgium, Finland, France and the Netherlands. Interestingly, this difference is very large in the case of Finland, where the difference between TULC and MULC growth appears to be especially large. Actually ULCs in the manufacturing sector declined between 1999 and 2007, while increasing in the total economy. This might be explained by the importance of the very innovative IT sector ("machinery and equipment," which among others included IT, which represented 39% of total Finnish exports in 2007).

In Austria and Germany (chart 7), where even TULC dynamics were rather moderate or even negative in the case of Germany, manufacturing ULC

growth rates are even lower, and were clearly negative between 1999 and 2007.<sup>12</sup>

In a further step, we calculated our alternative measure of manufacturing unit labor costs, weighted according to the export shares of the corresponding sector (TWULC). Interestingly, we find that in many cases (e.g. France, Germany, Portugal, Italy, Belgium and Austria) the difference between MULC and TWULC growth between 1999 and 2007 was either small or even negligible. There are, however, some interesting cases where these two measures differ substantially: In addition to the Spanish case described above, TWULC growth falls markedly short of MULC growth in Greece and the Netherlands. This implies that in these countries the export-oriented manufacturing sectors outperform the rest of manufacturing in terms of competitiveness. Finland is again an exception, being the only country (apart from Luxembourg in 2006) where TWULC growth exceeds MULC growth substantially, so that the export-oriented sectors gained less competitiveness than the total manufacturing sector. Again, it is possible that this reflects the importance of the high-tech IT sector, where Finland used to be the dominant global player. Compared to the value of the imported input factors, Finnish firms add only little value to these IT products; in other words, their export success depends mainly on their high level of technology and the cheap input imports.

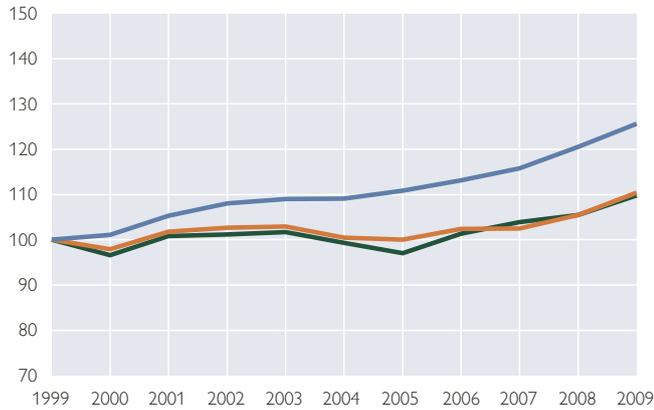
Overall, the TWULC trend differs from ULC growth in the manufacturing sector in some interesting country cases. These differences may reflect

<sup>12</sup> An analysis of the value added of exports shows that the domestic value added of this sector declined from 2000 onward reflecting the increasing share of re-exported goods. Still, the aggregate sector accounted for roughly 30% of value added of total exports in 2008.

**Development of Unit Labor Cost Measures: Intermediate Group**

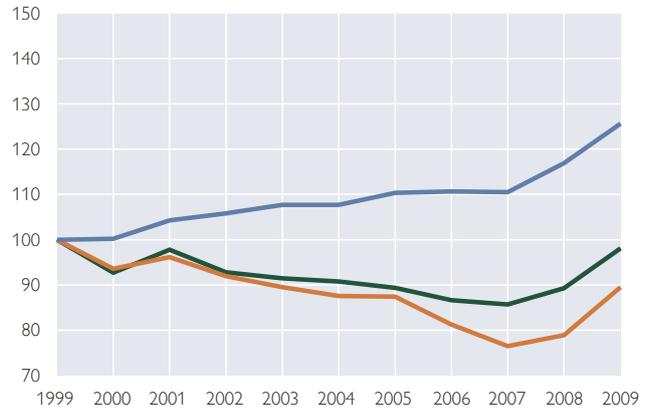
**Belgium**

1999=100



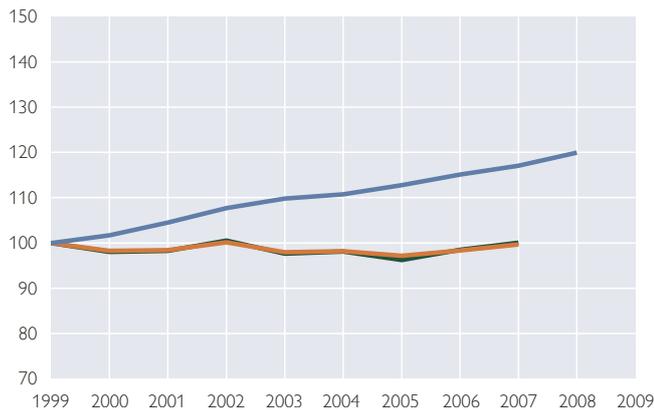
**Finland**

1999=100



**France**

1999=100



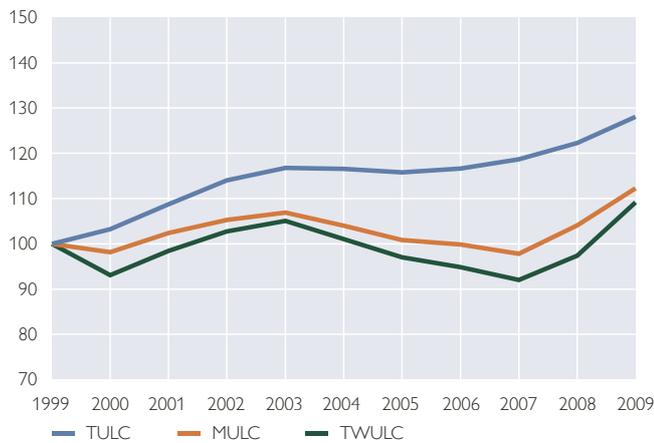
**Luxembourg**

1999=100



**Netherlands**

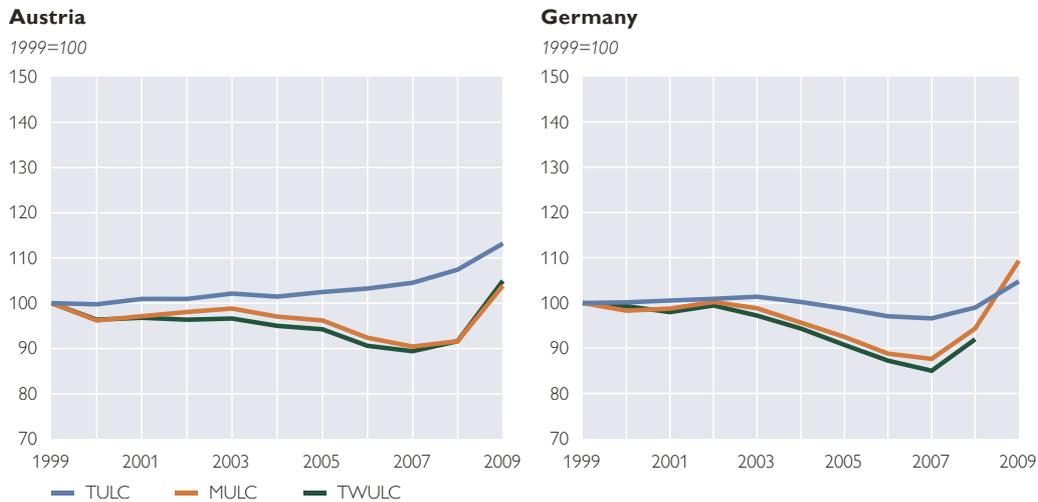
1999=100



Source: OECD (STAN database).

Chart 7

### Development of Unit Labor Cost Measures: Core Group



Source: OECD (STAN database).

differences in country size and in the diversity of the export sector, differences in the degree of similarity between domestic and export industries, and differences in the extent to which wage-setting procedures overlap (i.e. whether wage-setting is highly centralized, such as in Austria or Germany, or follows a less coordinated pattern). However, a detailed analysis of those determinants would clearly go beyond the scope of this paper.

### 3.3 Is the Kaldor Paradox Really a Paradox?

Chart 8 shows a scatter plot of average ULC growth and export growth over the pre-crisis period from 1999 to 2007, i.e. for the period for which we have TWULC values for most countries in our sample (except Luxembourg and Portugal). We focus on these long-term averages to relax the problem of endogeneity (i.e. the fact that ULC growth may depend also on the export performance) and to neglect the cyclicity of productivity. Furthermore, the price elasticity of exports could be rather low in the short run, as export volumes

react only after a certain time span following price increases (the “J-curve effect”). Nonetheless it needs to be pointed out that gross export growth might be biased by re-exports. This also might explain the persistent outlier position of the Netherlands in the charts below.

As suggested by theory and contrary to the commonly cited “Kaldor paradox,” the link between TULC growth and export growth (cumulative growth rates 1999–2007) is negative, but the explanatory power is very small. This weak fit is explained by the fact that countries such as France or Belgium have a very different export performance despite similar ULC developments. Similarly, export growth in Greece or Spain did not differ that much from export growth in Germany in the observation period but was realized with completely different ULC developments: While ULCs grew by more than 20% between 1999 and 2007 in Greece and Spain, they actually declined in Germany. Several articles study the coincidence of high ULC growth and a favorable trade perfor-

Chart 8

### Total Unit Labor Costs and Export Growth



mance in the Spanish case under the heading “Spanish paradox” (e.g. Antràs Puchal et al., 2010; Maroto Sánchez and Rubalcaba Bermejo, 2006; Crespo Rodríguez and Segura Cayuela, 2012). This conundrum is even more astonishing given that Spain has a more unfavorable geographical trade focus than other members of the currency union (like Germany), which weighs on its trade performance (Gaulier and Vicard, 2012). Darvas (2012) offers a similar study on Ireland.

Surprisingly, the link between MULC growth and export performance is even weaker, as shown in chart 9. The high export growth rates of the best-performing countries Netherlands, Austria, Germany and Belgium can be explained more conclusively, as MULC growth in those countries was considerable lower than in the total economy. The explanatory power for Finland and France, however, seems to decrease. While those countries exhibit very low (or in the case of Finland even consider-

Chart 9

### Manufacturing Unit Labor Costs and Export Growth



Chart 10

### Trade-Weighted ULC (TWULC) and Export Growth



ably negative) MULC growth rates, their export growth rates are much lower than expected. While the case of Finland was already discussed in detail above (including the high share of high-tech industry, where only a small part of value added in exports originates in Finland), French exports are dominated by machinery equipment, transport equipment, chemicals, fuels and plastic. In those sectors, nonprice factors, which are not covered by our analysis, might play a major role for export performance, causing countries mainly operating in such industries to perform rather poorly in this very simple bivariate correlation analysis.

In a final step, chart 10 shows the same analysis for our newly introduced measure of competitiveness, the trade-weighted unit labor cost (TWULC) index. While the results have to be interpreted with caution due to the low number of observations (cross-country analysis with only 11 observations), it seems nevertheless interesting that the explanatory power of our TWULC measure is substantially higher than TULC and MULC growth rates ( $R^2$  of 18% versus 10% and 6%, respectively). The main differences are the much

lower growth rates of ULC in export sectors than in overall industries in Greece, Spain and Portugal, and also less negative growth rates of the TWULC than the MULC measure in Finland. Our new measure would thus appear to be a better indicator for emerging competitiveness problems than conventional measures, given its focus on export-oriented sectors only.

To conduct a robustness check, we repeated our analysis by changing the sample period for our regression to 2000–2007, i.e. starting one year after the introduction of the euro, or by using an alternative benchmark (export data as well as export shares according to the OECD Main Economic Indicators database). However, our results were qualitatively unaffected by these changes.

#### 4 Discussion and Statistical Caveats

Measures of unit labor cost developments are key indicators for assessing the competitive position of countries. Yet empirical evidence shows that total economy ULC figures are often largely disconnected from export growth figures. Our analysis confirms only a

weak link between these two variables for the euro area countries.

Different hypotheses have been brought forward in the literature for this “Kaldor paradox.” In this paper we argue that total economy ULC measures may be misleading when judging the export competitiveness of a country because only a fraction of goods and services are in fact exported. ULC developments in the export-oriented sectors may be substantially different from those in the more domestically oriented industries, such as those related to the housing and construction booms in several euro area countries (Spain, Ireland).

We therefore propose an alternative measure of cost competitiveness, trade-weighted ULC (TWULC) growth, which uses disaggregate sectoral information and gives greater weight to those manufacturing sectors that have a higher relative importance within the export basket of a country. The TWULC measure thus better describes patterns in export-oriented industries. We find that ULC growth has typically been much higher in the total economy average than in the manufacturing sector since the establishment of the euro area. Manufacturing ULC growth exceeds ULC growth markedly in several cases in those industries that are highly exposed to international competition (TWULC). Especially in countries of the periphery and in countries affected by housing booms before the crisis we find evidence of a strong deviation of our TWULC measure from total economy ULC developments. In Austria, manufacturing ULC growth and trade-weighted ULC growth broadly coincide but both fall considerably short of total economy ULC developments. Furthermore, in a preliminary analysis, we find that TWULC developments appear to possess superior explanatory

power with regard to export performance as compared to more common measures of total or manufacturing ULC.

Overall, interpreting total economy ULC developments as indicators for external imbalances – as done in the Macroeconomic Imbalance Procedure and the Alert Mechanism Report at the European level (macroeconomic scoreboard) – may thus be highly misleading. The high ULC growth in periphery countries may be misinterpreted as being the main explanation for high current account deficits in the pre-crisis period. In reality, however, these external imbalances are to a large extent the result of strong import demand related to the interest rate decline after the introduction of the euro. A wrong diagnosis, in turn, may then lead to wrong policy recommendations.

In practice, however, the advantage of our newly proposed TWULC measure is limited on several accounts. First, unit labor costs may in general be a misleading indicator of competitiveness in industries where labor costs account only for a fracture of total costs; after all, this ratio differs substantially across sectors. Even when measured with more sophisticated measures, price competitiveness remains just one factor for export performance; other determinants such as quality, consumer preferences and common shocks also play a major role for export growth rates. Also the geographical pattern of trade specialization and the growth dynamics of export markets matter. Moreover, ULC data are based on value added, while export performance is measured by total revenues (based on sale prices). Clearly, final products include value added from various sectors, which can lead to considerable differences between sale

prices and deflators used to calculate ULCs. Unfortunately, however, this drawback cannot be solved in our study due to data constraints. The Kaldor paradox regarding the link between ULC developments and export performance thus remains a puzzle, as indicated by the low coefficient of determination in our correlation analysis.

Second, the TWULC measure gives low weight to sectors with low trading activity. Low trading activity in turn may result from low price competitiveness. In this sense the TWULC may be better suited to explain past export patterns. Our approach does, however, neglect the possibility of exploring new markets by improving the competitiveness of products. In this sense the TWULC measure may provide a biased impression of future export potential,

as the export orientation of sectors might be endogenous. Third, due to limited data availability, our TWULC measure is exclusively based on data for the manufacturing industry. This might cause a certain bias in our empirical results, as an increasing fraction of services is tradable today. The particular patterns of Luxemburg and Greece indicate the importance of also taking important service sectors such as tourism or financial services into account. Finally, sectoral data are currently only available with long publication lags. This makes the TWULC currently unsuitable for policy purposes such as the new surveillance procedures at the European level. Still, we hope that this paper may provide an impulse for a timelier and more reliable provision of sectoral ULC data.

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# Revision of Price/Cost Competitiveness Indicators for Austria

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The issue of short-term competitiveness, i.e. price and cost competitiveness, has moved to center stage in the economic policy debate amid the economic crisis. Within the Eurosystem, the various indicators that are used to monitor short-term competitiveness are revised at regular intervals by the ECB and national compilers. In Austria, these indicators are compiled by the OeNB in cooperation with WIFO, the Austrian Institute of Economic Research. The regular revisions are meant to ensure that the indicators adequately reflect changing country-specific trade patterns, remain useful measures and continue to be internationally comparable. In the revision undertaken in 2013, the basic conceptual framework was left unchanged in as much as the typical building blocks of the Austrian competitiveness indicator have been retained. At the same time, a number of adjustments were made: The previously fixed country weights were replaced by variable weights based on non-overlapping three-year periods, the underlying samples of trading partners and competing countries were adjusted, a services subindex was substituted for the existing travel and tourism subindex, and two new competitiveness indicators were added to enable cross-checks with the traditional consumer price-based measures. The two additions are, first, a new price competitiveness indicator for the manufacturing industry, based on relative producer prices and second, a new cost competitiveness indicator for the Austrian economy and the services industry, based on relative unit labor costs of the total economy. The revised set of indicators shows that Austria's price and cost competitiveness has improved continually over the past decade and a half, with manufacturing exporters experiencing stronger gains in competitiveness than other areas of the economy. Services providers have also become evidently more competitive since the beginning of 1999. Here, the improvement is found to be larger when we take into account changes in the HICP/CPI rather than total unit labor costs.

JEL classification: F3, F4

Keywords: effective exchange rates, price/cost competitiveness, (harmonized) competitiveness indicators, manufacturing sector, services sector, trade weights, third-market effects

## 1 Short-Term Price Competitiveness – A Prominent Measure in the Debate on Macroeconomic Imbalances

Benefiting from rising cross-border demand for goods but increasingly also for services, Austria has consistently run current account surpluses since 2002. The growing importance of services exports is not limited to classical travel and tourism exports but has also been fueled by the growing demand for knowledge-intensive services. Meanwhile, other euro area countries experienced rising current account deficits following their accession to monetary union until the onset of the global financial and economic crisis. Following

the outbreak of the crisis, current account imbalances, in particular imbalances among euro area countries, their causes and rebalancing measures that may be required moved to center stage in the economic debate. Such imbalances had been identified before the crisis hit, but they did not figure prominently in debates about economic policy. However, persistent increases in current account deficits are ultimately not sustainable, not even in a monetary union.

The diverging external trade performance of the euro area countries reflects, among other things, disparate developments of productivity, inflation, capital costs as well as labor costs – in other words, different changes in the

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short-term price and/or cost competitiveness of the individual countries. The divergent trade performance also results from the inability of the export industries to adjust fast enough to changes in demand patterns and globalization. Despite sweeping EU initiatives like the Lisbon 2010 agenda, policymakers paid too little attention to factors that have a *fundamental* influence on the international competitiveness of an economy, such as education, research or an economy's capacity for innovation. Like a country's tax system and its supply of public goods, its human capital portfolio (i.e. skills and knowledge), labor relations, the flexibility of labor markets and employment protection systems are key factors that define a country's attractiveness as a business location and its competitiveness in the medium to long term. Still, in the short run, competitiveness basically burns down to the price competitiveness of the external sector, which is driven by relative price changes reflecting the development of labor and capital costs, productivity gains or losses, and exchange rate changes.

To prevent the buildup of unsustainable current account imbalances in the future, the EU has developed a new alert mechanism for identifying and correcting macroeconomic imbalances. As this framework has been designed to pay particular attention to the development of competitiveness, the EU's scoreboard of macroeconomic indicators contains, among others, two indicators to measure short-term price/cost competitiveness and changes in market shares.

The usual approach to assessing the short-term (price and cost) competitiveness of a country is to analyze how its exchange rates and its domestic price

and cost indices have changed in relation to those of its trading partners. From a macro perspective it is the aggregate effect on an economy of all exchange rate changes that counts rather than the bilateral changes of parity. Therefore, an index calculated as the geometric weighted average of bilateral exchange rates – the *nominal effective exchange rate index* of a currency, say the euro – is a much more meaningful indicator of the economic impact of exchange rate changes than bilateral exchange rates. However, the nominal effective index shows only how the external value of a currency moves on average in relation to the currencies of a given country's trading partners. Thus, this index is useful mostly from a monetary policy perspective, for instance for assessing the effects of a depreciating or appreciating currency on the domestic inflation rate. Likewise, the national nominal effective competitiveness indices will show whether an appreciating or depreciating euro has had different effects on the individual euro area countries, taking into account country-specific differences in foreign trade patterns and the degree of openness of the economy.

However, it takes more than the nominal effective exchange rate index to arrive at a comprehensive assessment of the short-term price or cost competitiveness of a given economy. For this purpose, policymakers rely on *real effective exchange rate indices*, which are better suited to reflect changes in the competitiveness of producers on both home and external markets. Ideally, these indicators will relate to those areas where an economy faces international competition,<sup>2</sup> will adequately reflect country-specific trade patterns, and will build on reliable and inter-

<sup>2</sup> In other words, these indices must cover all internationally tradable goods and – ideally – services.

nationally comparable price and cost indices (Köhler-Töglhofer, 1999).

As an aggregate price/cost indicator for the euro area, the ECB's real effective exchange rate indices of the euro by definition mask differences in the price/cost competitiveness of individual euro area countries. Yet from a national perspective, such differences are a major yardstick for the performance of the individual member countries.<sup>3</sup> This is why *national price/cost competitiveness indicators* (i.e. *national real effective exchange rate indices*) have been calculated on the basis of a harmonized methodology and have been published for the individual euro area countries since 1999. All these indices are revised at regular intervals to keep reflecting trade relationships adequately.

The latest revision of the OeNB/WIFO price and cost competitiveness indicators for Austria in 2013 involved, first, adjusting/updating the list of the trading partners and competing countries and thus recalculating the individual country weights. Second, the set of indicators was also adjusted slightly. The existing indicator for the cost competitiveness of the Austrian manufacturing industry reflecting manufacturing unit labor costs was discontinued due to a lack of internationally comparable cost indices. To fill this gap, we now offer a new index tracking the price competitiveness of the manufacturing industry as deflated by the producer price index. Moreover, total unit labor costs are now used – alongside the HICP/CPI, as before – to measure the competitiveness of the total economy. The basic conceptual framework was left

unchanged, though: the Austrian competitiveness indicator continues to consist of four subindices, but a subindex for services was substituted for the existing subindex for travel and tourism.

Section 2 below presents the major changes resulting from the 2013 revision of the price competitiveness indicator, addressing, among other things, the informative value of the respective deflators. Section 3 provides a snapshot of the competitiveness of the Austrian economy based on the new and revised price and cost competitiveness indicators.

## 2 Revision of the Price Competitiveness Indicator for Austria

The euro area countries committed themselves in 1999 to use a harmonized methodology for calculating their national competitiveness indicators and to revise the indicators at regular intervals to catch up with changes in trade patterns. Past releases of the price competitiveness index for Austria have been consistent with the harmonized Euro-system methodology. The basic conceptual framework was left unchanged in the revision of 2013 in as much as the typical building blocks (see Hahn et al., 2001) have been retained except that the travel and tourism index was replaced by a services index. The competitiveness indicator compiled by the OeNB and WIFO can be characterized as follows:

- The aggregate index consists of four subindices calculated for manufactured goods, food, raw materials and energy products, and services.<sup>4</sup>

<sup>3</sup> See ECB (2000, 2003), Buldorini et al. (2002) and Schmitz et al. (2012) on calculating the nominal and real effective exchange rate indices for the euro.

<sup>4</sup> The country weights for the subindices for manufactured goods, raw materials and energy products, and food are based on the trade flows documented in these categories in line with the Standard International Trade Classification (SITC): manufactured goods (SITC Sections 5 to 8), raw materials and energy products (SITC Sections 2 to 4) and food (SITC Sections 0 and 1).

- The index is based on geometric weighting, i.e. it represents the weighted geometric average of a basket of bilateral exchange rates, which yields the price or cost competitiveness indicator when adjusted for the respective relative price or cost indices.
- For the *subindex for manufactured goods*, the individual country weights continue to be calculated on the basis of *single (bilateral) import and double (multilateral) export weights*. While single (bilateral) export weights are easy to calculate and intuitive, they neglect third-market effects, i.e. the effect of competition domestic exporters face in third markets, which increases in importance with expanding trade ties. The method of choice to catch third-market effects is to use “double export weights,” as they capture the effect of competition faced by Austrian exporters in foreign markets from both domestic producers and exporters from third countries (depicted in competition matrices; see annex). The drawback of double export weights is that they are more difficult to calculate<sup>5</sup> and less intuitive.
- The *index base period* was left unchanged at the first-quarter average (arithmetic mean) of 1999 (i.e. 1999 Q1 = 100), which is the base period established by the harmonized Euro-system framework.

## 2.1 Conceptual Changes and Adjustments to Changing Global Competition Patterns

### 2.1.1 Travel and Tourism Subindex Replaced by a Subindex for Services

During the 2013 revision of the OeNB/WIFO competitiveness indicator, the existing subindex for travel and tourism was replaced by a subindex for services. The country weights of the travel and tourism index corresponded to the weighted average of single (bilateral) import weights and double (multilateral) export weights, based on a competition matrix covering 30 countries.<sup>6</sup>

The travel and tourism index was replaced by the wider services index because there is a lack of sufficiently comprehensive internationally comparable data. This conceptual change coincides with the changing role of Austria as a provider of cross-border services: While in the past, travel and tourism services were the staple export of Austria's services industry, Austria is now exporting a broad range of state-of-the-art services. In recent years, innovative technology-based services (above all IT and information services and contract research; see Koller, 2012) have been accounting for increasing shares of Austrian services exports. In terms of revenue, the main services exports continue to be travel and tourism (2011: EUR 14.3 billion) and the

<sup>5</sup> Double export weights are calculated on the basis of complex competition matrices. These matrices also track any goods sold on the domestic market that were manufactured domestically and thus compete with imports from other countries. See box 1 in Köhler-Töglhofer et al. (2006). While the ECB takes net manufacturing output (gross manufacturing output less intermediate consumption by manufacturers) as the starting point for building the competition matrix for manufactured goods, the OeNB/WIFO use gross manufacturing output. The rationale behind this approach is that the OeNB considers only gross manufacturing output to be consistent with the foreign trade statistics derived from gross flows. Moreover, intermediate goods and services affect competitiveness. All other calculation steps are the same for both indicators. Given that gross manufacturing output exceeds net manufacturing output, the OeNB/WIFO indicator yields a higher share of domestic producers in a given market than the ECB indicator.

<sup>6</sup> The competition matrix for travel and tourism covered all countries with a share of at least 0.25% of Austria's travel and tourism revenues and expenditures (plus Finland and Luxembourg) as reported in the Austrian balance of payments.

traditional services industries, such as transportation, construction, wholesale and retail trade, operational leasing, agricultural and mining services (2011: EUR 15.6 billion). Exports of knowledge-intensive services,<sup>7</sup> however, grew at a particularly impressive rate from the mid-1990s up to 2008, with average annual growth rates of 13%. When exports collapsed in 2009 amid the global economic crisis, exports of knowledge-intensive services moreover proved to be fairly resilient to the crisis, dropping by just 6%, whereas goods exports suffered a 20% setback. Measured in terms of the absolute export revenues generated by knowledge-intensive business services, architecture, engineering and other technical services are the single most important category, followed by IT and information services (see Walter, 2011, p. 12). Reflecting the rising value added by services other than travel and tourism, a new subindex for services has been added to the Austrian competitiveness indicator. Given a lack of comparable international data on the gross output of services, it is not (yet) possible to calculate double export weights for the services subindex. The new services subindex reflects trade relations with Austria's 56 most important trading partners, who are also relevant for other subindices (see table A1 in the annex).

### 2.1.2 Fixed Country Weights Replaced by Variable Weights Based on Non-Overlapping Three-Year Periods

The Austrian competitiveness index used to be based on a *fixed* weighting system, consisting of single (bilateral) import weights, single (bilateral) export weights for food as well as raw materials and energy products, and double (multilateral) export weights for manufactured goods, and travel and tourism. The underlying country weights were fixed over the entire calculation period starting from 1999 with the trade weights established during the successive rounds of revision (three-year averages for external trade shares).<sup>8</sup>

An important *conceptual change* of the revision undertaken in 2013 is that the *fixed* country weights were dropped. Instead, the index is now calculated as a *chained index*.<sup>9</sup> At the time of writing, the most current set of comparable external trade data relates to the three-year period from 2007 to 2009. This leaves us with five sets of country weights based on successive three-year averages (1995 to 1997, 1998 to 2000, 2001 to 2003, 2004 to 2006 and 2007 to 2009). The effective exchange rate indices are obtained by chain-linking the indicators based on each of these five sets of trade weights at the end of each three-year period. The latest three-year period for which data could be compiled in 2013 determines the

<sup>7</sup> Knowledge-intensive services include telecommunications services; IT and information services; R&D services; licensing fees for patents and know-how; architecture, engineering and other technical services; legal consultancy fees; accounting and tax advisory services; business consulting; advertising and market research; personal services; culture and recreation services.

<sup>8</sup> The country weights established in the revision of 2001 related to the external trade patterns of the period from 1995 to 1997; the country weights established in the revision of 2006 were based on the three-year average for the period from 1999 to 2001.

<sup>9</sup> In some respects, the existing price competitiveness index was already a chained index, as the index for the period up to 1999 remained based on the sample of trading partners and competing countries underlying the revision of 2001, for which the weights were calculated on the basis of the 1995 to 1997 period. This procedure was chosen because it ensured a more adequate reflection of Austria's trade relations and thus of its competitiveness situation in the 1993 to 1998 period.

country weights for evaluating the price and cost competitiveness of Austria in the coming years, or until the next full three-year dataset becomes available.<sup>10</sup>

### 2.1.3 Changes in Country Coverage

To reflect changes in the pattern of Austrian exports, the *sample of trading and competing countries* was adjusted as well when the indicator was revised in 2013. The index is now based on a sample of 56 countries.<sup>11</sup>

An assessment of the changes in the country weights during the last decade and a half or so shows that the “ranking” of Austria’s main trading partners has in essence remained unchanged; at the same time, there have been slight changes in the *relative* importance of individual trading partners. Based on the weighting for the 2007 to 2009 period, the **aggregate index** (export- and import-

weighted across all subindices) continues to be characterized by a high foreign trade share of the countries that joined the EU before 2004 (56.9%), whereas the countries that acceded to the EU in 2004 and 2007 account for a share of 12.5%. Germany remains the country with the largest country weight (33.3%), followed by the U.S.A. (9.1%) and Italy (7.6%). France and Switzerland each have a weight of some 3½%, and the Czech Republic and the Netherlands a weight of about 3% each. The high weight of the U.S.A. – i.e. of the U.S. dollar – results above all from the raw materials and energy products subindex, as imports in this category are mostly denominated in U.S. dollars (see table A1 in the annex).

The price competitiveness patterns evident from the revised aggregate index broadly match that of the previous

Chart 1

## Chained Aggregate Index of Austria’s Price Competitiveness since 1997: Previous Index versus Revised Index

### Nominal

1999 Q1 = 100



### Real, deflated by the relative HICP/CPI

1999 Q1 = 100



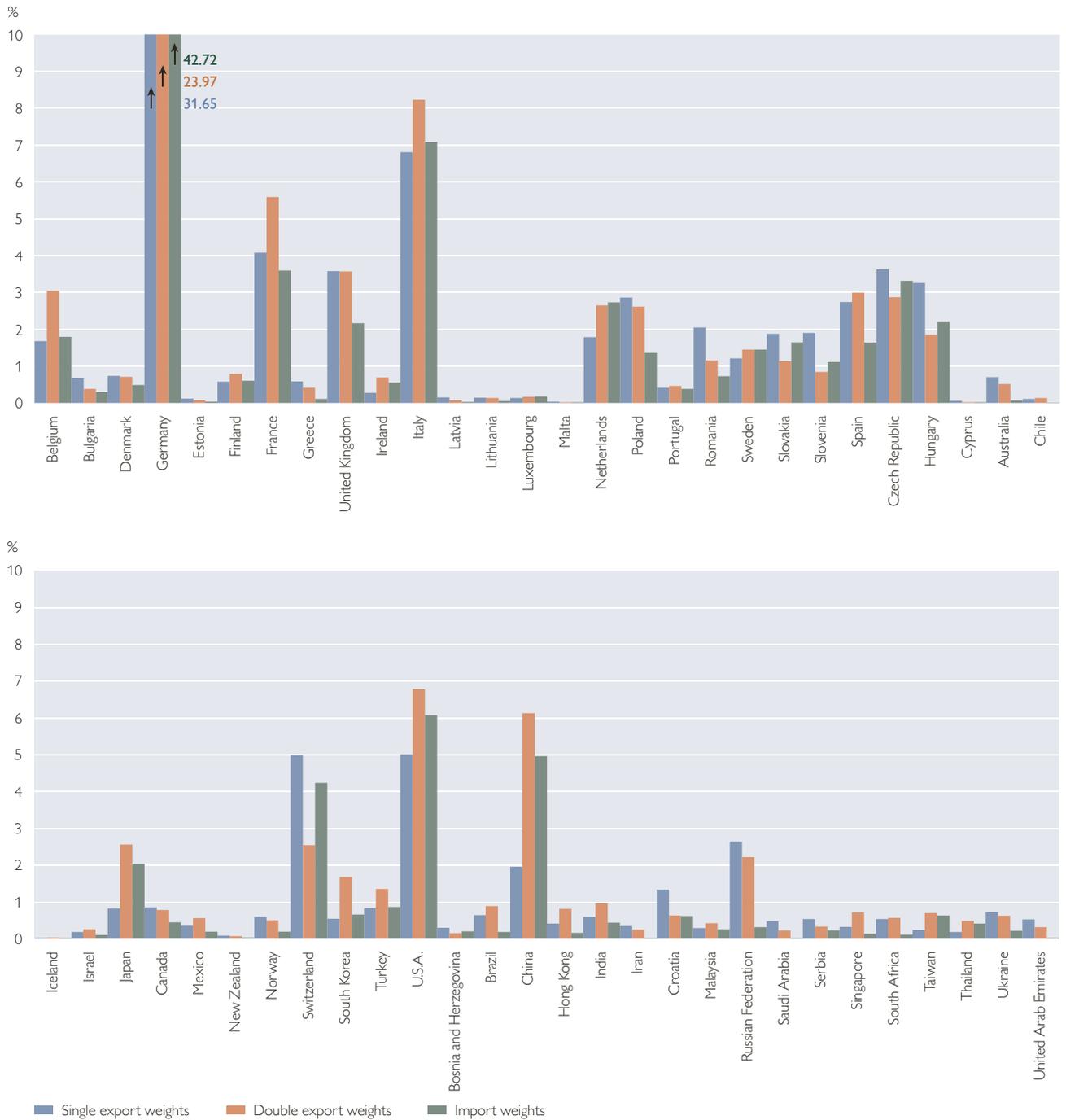
Source: OeNB/WIFO.

<sup>10</sup> The next update is due when the full dataset becomes available for the 2010 to 2012 period.

<sup>11</sup> Compared with the latest revision in 2006, the sample of trading partners and competing countries has been reduced by 6 countries.

Chart 2

Single and Double Export Weights in the Manufactured Goods Subindex (Period 2007 to 2009)



Source: OeNB/WIFO.

index. The slight shift in the level since 2007 evidently reflects the adjustment of trade weights based on the external trade data for the three-year period from 2007 to 2009.

As outlined above, the export weights for the **manufactured goods subindex** are calculated as **double export weights** reflecting third-market effects. An analysis of both double export weights and single export weights across the non-overlapping three-year periods produces some interesting insights: Germany's weight has shrunk significantly over time. Similarly, the weights of Switzerland, Italy, Japan and the U.S.A. have gone down. Conversely, the weights of some of the countries that joined the EU in 2004 or 2007 (such as Poland, Slovakia, the Czech Republic or Romania) have increased markedly. Overall, China and the Russian Federation stand out as the countries whose relevance for Austrian manufacturing exporters reflects the largest increases (see table A3 in the annex).

With regard to the impact of foreign competition on domestic industries in third markets, a cross-check of single and double export weights shows that in the case of Germany, Austria's single most important trading partner, the direct export weight is markedly larger than the export weight that includes competition for domestic exporters in third markets. The same holds true for Switzerland and many of the countries that joined the EU in 2004 as well as for the Russian Federation (see chart 2). The reverse is the case for China, the U.S.A., Japan, Turkey and most of the Asian emerging markets (e.g. South Korea, India, Hong Kong, Singapore or

Taiwan). These emerging countries and their staple exports constitute ever stronger competition for domestic exporters in third markets. Conversely, countries whose double export weight is below their single export weight are not as much of a competition for domestic exporters in third markets. This may be because they are targeting different regions with their exports, or because they export different goods and services. Germany, for instance, is the single most important export destination for Austrian manufacturing exporters, but in third markets, German exports appear to be less of a competition for Austrian exports.

In this evaluation of the short-term price competitiveness of Austrian manufactured goods exporters, the EU-27 aggregate now has a share of 65.8%. In other words, other EU countries continue to account for the lion's share of Austrian manufacturing exports; at the same time, this share has dropped by 8 percentage points in the last decade and a half. The weight of the euro area (now 51%) has also been decreasing. While exchange rate uncertainty has disappeared within the euro area, the 51% must not be misinterpreted as the share of Austrian exports that is no longer exposed to exchange rate risks. Competition in non-euro area markets,<sup>12</sup> as reflected by double export weights, causes bilateral exchange rate changes of the euro to other currencies to continue to exert an – indirect – influence on Austrian exports. Of course, the same holds true for Austria's competitors from other euro area countries. In addition, the competitiveness of domestic exporters relative to

<sup>12</sup> To give an example, the double export weights account for the competition between Austrian and German exports both in the German market and in all other euro area and non-euro area markets. In these non-euro area markets, exchange rate changes of the euro to the respective national currency matter for Austrian and German exporters alike.

those in other euro area countries also depends on the relative changes in cost and price levels.

The aggregate share of those EU countries that have not yet joined the euro area (14.8%) has remained broadly unchanged over time. Yet the aggregate masks a comparatively strong decline in the share of the United Kingdom and a rising importance of Poland, the Czech Republic and Romania for Austrian manufacturing exports. In addition, the weight of Switzerland has dropped markedly since the latter part of the 1990s, and so have the shares of the U.S.A. and Japan. Conversely, China has gained tremendous importance for domestic manufacturing exporters over the past 15 years. China's country weight has risen from 1.7% (1998 to 2000) to 6.2% (2007 to 2009) and is now almost on a par with that of the U.S.A., making China even more important for domestic manufacturing exporters than France, which is after all Austria's third-largest export trading partner within the EU.

Compared with exports of manufactured goods, domestic **services exports** continue to be more focused on EU markets (close to 76%; euro area: 59%). Again, Germany is Austria's single most important trading partner (with a share of 38.4%), followed by Switzerland (6.1%), Italy (5.5%), the United Kingdom (4.6%) and the Netherlands (4.4%).

In the **subindices for raw materials and energy, food and services**, the **U.S.A.** stands out. Its share appears to be astonishingly high at a first glance, because, in addition to the underlying imports and exports, corresponding imports and exports to and from coun-

tries not specified in the index<sup>13</sup> are billed in U.S. dollars and hence add to the weight of the U.S.A./the U.S. dollar.

## 2.2 Two New Competitiveness Indicators Added to Enhance Analysis

In the past, the measure **indicating the Austrian economy's price competitiveness** was based on an **HICP/CPI** deflator. The HICP/CPI deflator is the most widely used method for calculating real effective exchange rate indices and national competitiveness indicators. This method has its merits but also comes with some drawbacks: The key advantages are the *timely availability* and the *international comparability* of data, which are derived from standardized baskets of goods reflecting average living standards.

Yet the goods baskets underlying consumer price indices contain large amounts of nontradable goods,<sup>14</sup> which makes them an imperfect proxy for changes in tradable goods prices. At the same time, consumer prices may be "misleading indicators of the prices of traded goods" (Lafrance et al., 1998), as the exposed and protected sectors of an economy tend to have divergent productivity patterns. Moreover, HICP/CPI-deflated measures do not reflect changes in the prices of capital goods (which account for a large share of foreign trade), whereas import prices have a significant influence on the development of the HICP/CPI. Finally, the meaningfulness of the indicator may be distorted by indirect taxes on goods that are reimbursed upon export (unless goods are acquired directly by foreign households) and by export subsidies.

<sup>13</sup> Rest of the world.

<sup>14</sup> In the Austrian HICP, nontradable goods and services have a weight of 45%.

To provide a more robust assessment of the competitiveness of Austrian manufacturers, a new index was added when the set of competitiveness indicators was last revised in 2006 to show how competitive the Austrian manufacturing industry is in terms of unit labor costs in the manufacturing sector. Unit labor costs are, without doubt, a key determinant of manufactured goods sales prices and thus a key indicator of the short-term competitiveness of an economy. In view of the limited availability of internationally comparable data on manufacturing unit labor costs, the index was calculated for a comparatively narrow sample of competing countries and trading partners.<sup>15</sup> The data were derived from the OECD, which stopped updating the calculation of comparable unit labor costs for the manufacturing sector in 2012, however. Therefore, retaining the cost competitiveness indicator introduced in 2006 was not an option.

As a second-best solution, a new index of **manufacturing price competitiveness based on producer prices** was added when the set of competitiveness indicators was revised during the 2013 update. The rationale for using producer prices as a deflator is to take a deflator that is more relevant for tradable goods than the HICP/CPI. While producer prices reflect both products that sell well internationally and products that are marketed less successfully abroad, producer prices can be assumed to relate above all to internationally active industries, as they cover mainly

manufactured goods and intermediate goods used in the manufacturing process. Hence, producer prices are considered to be a “reasonable proxy for tradable goods prices” (Schmitz et al., 2012).<sup>16</sup> At the same time, producer price indices are characterized by country-specific differences in composition and compilation (Schmitz et al., 2012). The prices observed are factory sales prices excluding VAT, adjusted for discounts or rebates and excluding transportation costs: “Output producer prices can be described as indices designed to measure the average change in the price of goods and services as they leave the place of production valued at basis prices. They exclude any taxes, transport and trade margins that the purchaser may have to pay.” (OECD, 2010, p. 90). Since internationally comparable producer prices are not available for all relevant trading partners of Austria, the new index is based on only 26 competing countries.<sup>17</sup> Whereas consumer price indices are released monthly, deflators for analyzing cost competitiveness, such as total unit labor costs and producer price indices, are available only on a quarterly basis and are, moreover, subject to longer publication time lags.

The other new addition is an **indicator of cost competitiveness** based on total unit labor costs. Unlike in the past, the new indicator of cost competitiveness added during the 2013 revision does not relate to the manufacturing industry, but to the total **economy** and to **services**. As discussed in Köhler-Töglhofer (1999), the use of total unit

<sup>15</sup> Comparable data on manufacturing unit labor cost developments were available only for the member countries of the Organisation for Economic Co-operation and Development (OECD). Hence, the sample of competing countries and trading partners used for this indicator consisted of 24 countries (based on OECD membership in 2006, excluding Denmark, Luxembourg, Portugal, Slovakia and Turkey). Those countries covered 85% of all relevant exports from Austria, though.

<sup>16</sup> This assessment excludes nonindustrial goods, retail goods and services.

<sup>17</sup> France, Belgium, Luxembourg, the Netherlands, Germany, Italy, Ireland, Spain, Finland, Greece, the Czech Republic, Denmark, Estonia, Hungary, Poland, Sweden, Slovenia, Slovakia, the United Kingdom, Australia, Canada, Norway, Switzerland, the U.S.A., New Zealand and Chile.

labor costs as a deflator is fraught with crucial drawbacks, as total unit labor costs also reflect changes in labor costs and in the productivity of the nontradable sector of production. If we assume that labor costs for nontradable costs and personal services rise faster than labor costs in the tradable sector, cost competitiveness indicators based on such deflators must be subject to a certain bias. To the extent that nontradable goods or services constitute intermediate inputs to the products ultimately marketed by exporters, though, they exert a significant influence on competitiveness. Moreover, the use of *unit labor costs* as deflators, be it for manufacturing industries or for the total economy, is subject to methodological problems, such as the fact that these costs are sensitive to the business cycle. Unit labor costs are calculated by dividing the (hourly) compensation per employee by the (hourly) real value added per person employed in the manufacturing industry or in the total economy. Empirical evidence shows that labor productivity grows in boom phases but drops in economic downturns;<sup>18</sup> in other words, labor productivity follows the business cycle.<sup>19</sup> Furthermore, the transition from labor-intensive to capital-intensive production methods also reduces the usefulness of the cost competitiveness indicator. If labor productivity growth results from the substitution of capital for labor and

if declining unit labor costs go hand in hand with rising capital unit costs, the cost competitiveness indicator overstates the competitiveness gains. Another methodological problem consists in the fact that productivity growth as such is endogenous and that strong productivity gains need not necessarily imply an improvement in competitiveness, but may also imply that competitiveness problems existed in the first place.<sup>20</sup> The countries at the southern periphery of the euro area are a case in point. Their price competitiveness has improved simply on account of the fact that staff layoffs caused the productivity measures of those countries to improve for manufacturing and for the total economy. Since internationally comparable total unit labor costs are not available for all relevant trading partners of Austria, the new index is based on only 29 competing countries.<sup>21</sup> These 29 countries, however, account for more than 85% of Austria's foreign trade in goods and services.

### 3 What Do the Various Price Competitiveness Indicators Say?

#### 3.1 Marked Price Competitiveness Gains for Austrian Manufacturers since the Launch of the Euro

Following the establishment of the European monetary union in January 1999, **domestic manufacturing exporters'** price competitiveness improved by 6% in real

<sup>18</sup> Productivity decreases during pronounced economic setbacks or recessions. As a case in point, a quarterly analysis of productivity data for Austria shows five successive quarters of declining productivity for the total economy and four successive quarters of declining productivity for manufacturing in the crisis period 2008/09. The decline in manufacturing output was the driving force behind the development of total productivity.

<sup>19</sup> Consequently, unit labor costs will rise during economic downturns and drop during economic upswings. Therefore, an adequate assessment of changes in cost competitiveness requires these changes to be adjusted for cyclical components.

<sup>20</sup> When excessive wage increases make jobs unprofitable, layoffs or business closures cause jobs – typically those with the highest unit labor costs – to be destroyed. As a result, productivity will rise and unit labor costs will decline.

<sup>21</sup> France, Belgium, Luxembourg, the Netherlands, Germany, Italy, Ireland, Portugal, Spain, Finland, Greece, the Czech Republic, Denmark, Estonia, Hungary, Poland, Sweden, Slovenia, Slovakia, the United Kingdom, Australia, Canada, Japan, Norway, Switzerland, the U.S.A., South Korea, New Zealand and Israel.

terms up to the end of 2012, judging from the export-weighted competitiveness index as deflated by HICP/CPI. Taking into account also the underlying nominal effective appreciation by 3.7%, the relative improvement that is attributable solely to changes in price patterns was in fact close to 10%. A cross-check with the competitiveness indicator that is based on the producer price index confirms this uptrend. This indicator dropped by almost 8% in the period from the first quarter of 1999 up to the fourth quarter of 2012; here,  $\frac{1}{2}$  percentage point of the improvement can be traced to the underlying nominal effective depreciation.<sup>22</sup>

Based on the HICP/CPI-deflated competitiveness indicator, Austrian manufacturing exporters became more competitive in terms of prices by a measure of close to 9% from early 1999 until June 2001. In this respect, they benefited from the exchange rate movements of the euro against the U.S. dollar and the Japanese yen, which contributed to the nominal effective depreciation observed in this period (5%). Hence, it does not come as a surprise that domestic manufacturing exporters became more competitive especially relative to the U.S.A. and Japan in relation to which the real depreciation totaled almost 30% and 15%, respectively. While domestic manufacturing exporters made little headway in becoming more competitive in intra-euro area trade (about 1%), they experienced substantial price competitiveness gains compared with those EU countries which have not yet introduced the euro. Again, about 45% of the improvement was attributable to the underlying nominal exchange rate movements. However, relative to the U.S.A., the exchange rate

movements accounted for the entire improvement, and for most of the improvement relative to Japan.

All the price competitiveness gains domestic manufacturing exports made from mid-2001 onward were reversed until the end of 2004 on account of exchange rate changes, with the euro firming against the U.S. dollar, the Japanese yen and the pound sterling. While domestic exporters continued to improve their competitiveness against their euro area trading partners by a small margin, they lost competitiveness against all other destinations. However, part of the negative impact of the exchange rate developments relative to the non-euro area EU countries did not feed through to price competitiveness. The opposite was the case with Japan, where the strong exchange rate-related losses were accompanied by an even stronger loss of price competitiveness.

In the course of 2005, the tides turned again: domestic exporters regained almost 5% in price competitiveness, mostly on account of the underlying exchange rate movements, which were in turn largely attributable to the appreciating U.S. dollar. The improvement was only temporary. It was offset entirely between late 2005 and April 2008, again essentially as a result of exchange rate fluctuations (while the euro appreciated strongly against the U.S. dollar and the Japanese yen, it depreciated somewhat against the currencies of the non-euro area EU countries). Relative to Japan, the setback that Austrian exporters suffered in their price competitiveness was much sharper than the exchange rate-related fluctuations would have suggested. Against all other destinations, domestic producers managed to partly offset the

<sup>22</sup> *The divergence in the movements of the nominal effective exchange rate index is the result of diverging country samples and corresponding changes in the country weights.*

strong exchange rate-related losses thanks to comparatively more favorable HICP/CPI developments. The period until November 2008 saw another improvement, which was followed by yet another offsetting movement in the following months; in both cases, the underlying exchange rate movements were the driving force.

Starting in September 2009, Austrian manufacturers managed to regain competitiveness relative to their competitors until mid-2010, based on a real effective depreciation by 5½%, which was driven by a broadly corresponding nominal effective depreciation. In the course of the global economic crisis, the euro depreciated sharply against the U.S. dollar, the Japanese yen and the currencies of the non-EU countries. Some of this improvement was lost again in the following months, up to April 2011, but the loss was subsequently reversed in the period until August 2012. A regional breakdown shows that the sharp depreciation of the euro against the Japanese yen in the period from mid-2010 until the end of 2012

did not fully feed through to the real effective index. In the case of all other regions, the development of the real effective index was driven by nominal exchange rate changes. Finally, in the period from mid-2010 until the end of 2012, domestic manufacturers also lost the competitiveness gains they had made relative to their fellow euro area countries following the establishment of monetary union.

As measured by the HICP/CPI-deflated index, the price competitiveness of Austrian manufacturing exporters has been essentially determined by the changes in the nominal effective exchange rate index since mid-2001, and in particular since the onset of the global financial crisis, i.e. the collapse of Lehman Brothers.

The story told by the HICP/CPI-deflated price competitiveness index for the domestic manufacturing industry is confirmed by the new **PPI-deflated index** calculated for just 29 competing countries. This index reveals competitiveness gains for Austrian manufacturing exporters in the range of about 7%

Chart 3

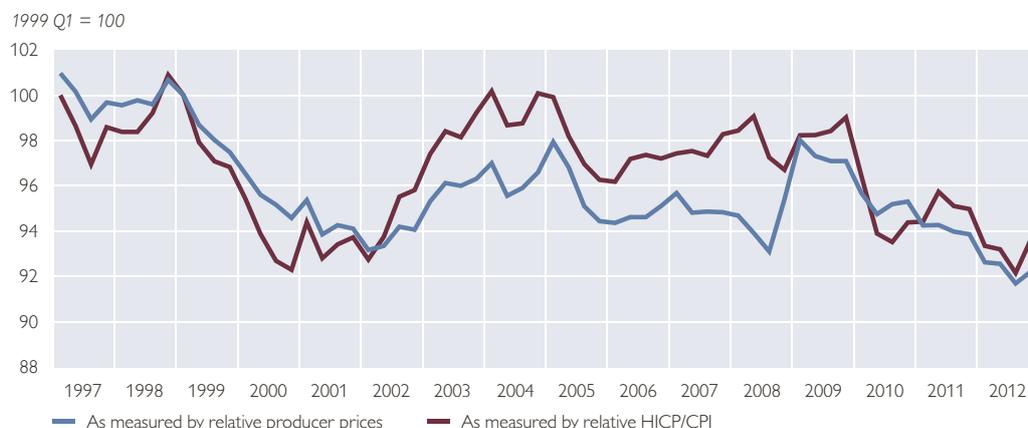
### Export-Weighted Real Effective Exchange Rate Index for Manufactured Goods (Deflated by HICP/CPI) by Destinations

1999 Q1 = 100



Source: OeNB/WIFO.

### Export-Weighted Real Effective Exchange Rate Indices for Manufactured Goods



Source: OeNB/WIFO.

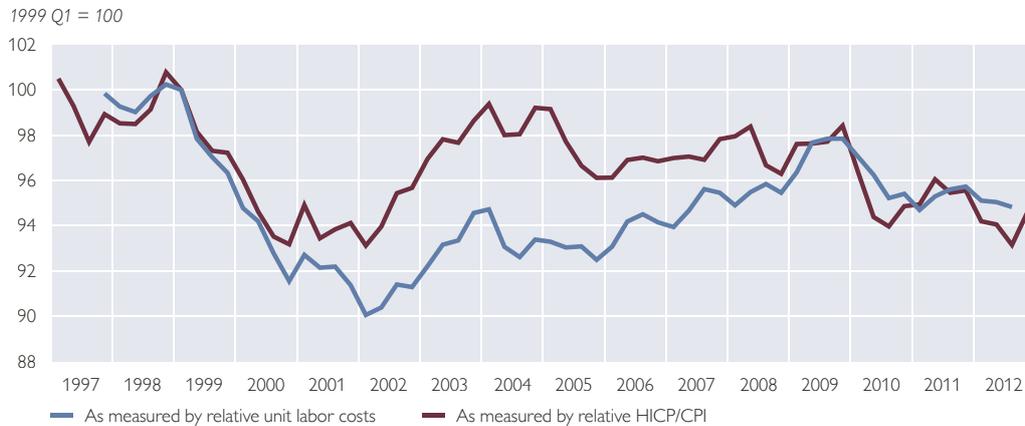
for the first three years following the establishment of monetary union, 4 percentage points of which were found to be attributable to the underlying nominal effective depreciation. The subsequent years were characterized by a steady (exchange rate-driven) real effective appreciation, which lasted until the first quarter of 2005 and was subsequently reversed until mid-2008. As the Austrian economy suffered a setback following the global financial crisis, the Austrian manufacturing industry temporarily (from the third quarter of 2008 to the end of 2009) lost more than 4% in price competitiveness. Half of this loss was attributable to the comparatively stronger increase of domestic producer prices. It took domestic manufacturers until the first quarter of 2012 to reverse these losses, largely supported by a nominal effective depreciation.

As measured by the (export-weighted only) price competitiveness index deflated by producer prices, domestic manufacturing exporters gained in competitiveness relative to their trading partners by a measure of 8% from early 1999 to late 2012; the nominal effective depreciation amounted to about ½% in this period.

### 3.2 Progressive Price and Cost Competitiveness Gains for Austrian Producers and Services Providers since Early 1999

As deflated by total unit labor costs, the (export-weighted as well as import- and export-weighted) index measuring the **cost competitiveness of Austrian producers and services providers (aggregate index)** shows competitiveness gains of 10% for the period from early 1999 until the first quarter of 2002, 40% of which were related to exchange rate developments. From the second quarter of 2002 until the first quarter of 2004, Austrian exporters suffered competitiveness losses, which were likewise driven by exchange rate developments. This period was followed by slight improvements, which were only temporary, though. From the fourth quarter of 2004 until the end of 2009, Austrian exporters' cost competitiveness fell by some 5%, mostly on account of labor cost developments, which developed less favorably in Austria than abroad. Since early 2010, Austrian producers and services providers have regained some competitiveness as a result of exchange rate developments.

Chart 5

**Real Effective Exchange Rate Indices (Aggregate Indicator)**

Source: OeNB/WIFO.

The international cost competitiveness of Austrian producers and services providers improved by a total of 5% from the start of monetary union until the fall of 2012; 2 percentage points thereof can be attributed to the changes of the nominal effective exchange rate index. Yet this indicator may very well underestimate the competitiveness of Austrian producers and service providers, as total unit labor costs are largely determined by nontradable, low-productivity services.

When cross-checking these figures with the HICP/CPI-deflated price competitiveness indicator with the cost competitiveness indicator, we see that the results do not fully match. Deflated by the HICP/CPI, the aggregate index shows price competitiveness to have improved by 7% in the first three years of monetary union, with almost half of the improvement attributable to exchange rate changes. The subsequent nominal effective appreciation by about 8% observed until the first quarter of 2004 did not feed through entirely to price competitiveness. This period was followed by (largely exchange rate-related) price competitiveness gains

until the first quarter 2006, which were, however, almost fully reversed until the end of 2009. When we look at the period from early 2004 until late 2009, we find Austrian exporters to have experienced marginal gains in price competitiveness despite the underlying nominal effective appreciation. This pattern is not consistent with the pattern reflected by the cost competitiveness indicator. The cost competitiveness indicator implies that the Austrian economy lost about 3% in competitiveness in this period, with half of the loss being driven by exchange rate developments. For the period from late 2009 until late 2012, the price competitiveness indicator and the cost competitiveness indicator coincide in showing a 3% recovery of competitiveness, albeit almost entirely on account of exchange rate movements. Finally, when we look at the entire period from early 1999 until late 2012 and cross-check the HICP/CPI-deflated indicator with the unit labor cost-deflated indicator, we also arrive at price competitiveness gains totaling 5%, of which only a small part was determined by exchange rate developments.

### 3.3 Austrian Services Providers Made Stronger Gains in Price Competitiveness than in Cost Competitiveness

When we look at the (export- and import-weighted) indices designed to reflect the **cost competitiveness of services providers** on the basis of total unit labor costs<sup>23</sup> we also find competitiveness gains in the first few years following the launch of the euro. Until the first quarter of 2002, the figures add up to a real effective depreciation of 11%, supported by a nominal effective depreciation of about 5%. In other words, domestic services providers benefited from more moderate wage policies and/or higher productivity gains. This compares with a real depreciation of 7% as measured by the relative changes of consumer prices, with half of the improvement observed on the basis of this indicator being attributable to exchange rate developments. For the next two years, both the index based on unit labor costs and the index based on HICP/CPI show a reversal of these gains, in both cases entirely on account of exchange rate developments. Up to the end of 2005, the two indicators coincide in showing renewed slight gains, roughly half of which were driven by exchange rate changes. The subsequent years, however, brought marked setbacks, in particular with regard to cost competitiveness. Exchange rate changes played some role in this respect, but the main driver was a comparatively sharp rise in unit labor costs. Cross-checking these results with the HICP/CPI-deflated competitiveness index, we find the loss of price competitiveness of services providers to have been triggered entirely by exchange rate changes until April 2008, the pass-through of which

to the real effective measures was limited, though. The slight improvement observed in the subsequent months on the basis of the HICP/CPI-deflated competitiveness index was, however, reversed once more as a result of the global crisis until the end of 2009.

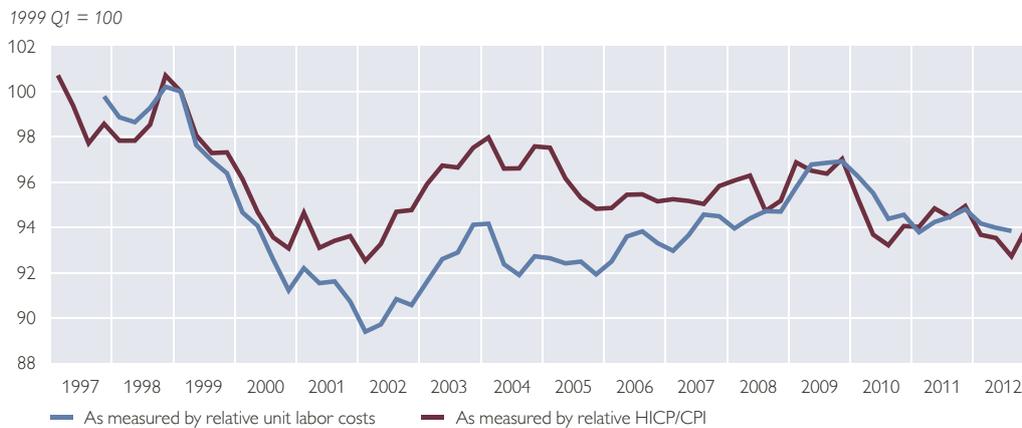
The long-term patterns imply that domestic services providers made stronger gains in competitiveness in terms of total unit labor costs than they did in terms of consumer prices from early 1999 to early 2002. Yet they subsequently lost the competitive edge implied by the cost competitiveness indicator over the price competitiveness indicator until the end of 2009. When we look at the competitiveness gains during the entire period from early 1999 to late 2009, the results of the two indicators are more or less the same. But the matching headline results mask highly divergent underlying nominal effective exchange movements that result from the fact that the two indicators are based on different country samples and hence on different country weights. The nominal effective appreciation totaled 7% in the case of the price competitiveness indicator but only some 3% in the case of the cost competitiveness indicator. This implies that Austrian services providers benefited more strongly from changes in relative consumer prices than they did from changes in relative unit labor costs.

Since early 2010 until the fall of 2012, domestic services providers again experienced small gains in cost and price competitiveness as a result of exchange rate changes. However, given a comparatively stronger increase in unit labor costs and a comparatively stronger increase in HCPI/CPI inflation, the exchange rate changes did not suffice to offset the earlier losses.

<sup>23</sup> This indicator is based on 29 competing countries.

Chart 6

### Real Effective Exchange Rate Indices for Services



Source: OeNB/WIFO.

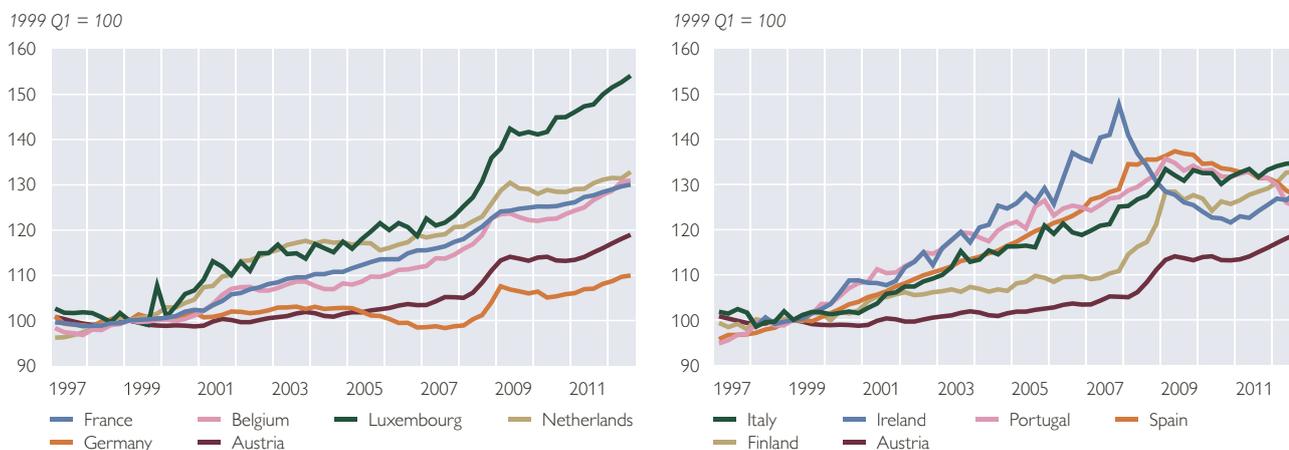
Over the full length of the review period – from early 1999 until late 2012 – domestic services providers were able to increase their price competitiveness by 6%. Given an underlying nominal effective appreciation of 3%, this improvement was not driven by exchange rate changes. A regional breakdown shows that Austrian services providers failed to outperform providers from other euro area countries in this period. Conversely, they gained significant ground in terms of price competitiveness relative to those EU countries which have not yet joined the euro area (13%), and they would have gained even more in the absence of adverse exchange rate developments. Supported by exchange rate developments, they also visibly gained competitiveness vis-à-vis the U.S.A. (11%). Conversely, Austrian services providers suffered significant losses vis-à-vis Japan (15%), benefiting at the same time from favorable exchange rate developments without which the loss would even have been much stronger.

### 3.4 Total Unit Labor Costs in Austria in Comparison to its Trading Partners

Unit labor costs in the Austrian total economy as a whole remained broadly stable from early 1999 until late 2004, thus developing even more moderately than total unit labor costs in Germany, which grew by 3% in this period compared to 16% in Italy and 5% in Switzerland. Even stronger increases were observed in Luxembourg (+17%), the Netherlands (+17%), Spain (+16%), Greece (+20%), Portugal (+21%) and especially Ireland (+25%). In the U.S.A., unit labor costs rose by 11%, whereas they declined by 15% in Japan. Some of the countries that had joined the EU in 2004 also reported particularly high increases, such as Hungary (+55%), Slovakia (+35%) and the Czech Republic (+23%). Poland was an outlier with a decrease by 6%.

The story is different, to some extent, for the period from late 2004 until the third quarter of 2008 (when the global economic crisis was set off by the collapse of Lehman Brothers). In this period, total unit labor costs in Austria rose gradually by 7%, which was still moderate, though, compared

### International Comparison of Total Unit Labor Costs (in Local Currencies)



Source: OeNB/WIFO.

with developments in other trading partner countries (the exception to this observation being Germany, because German unit labor costs decreased by some 2% in this period). Irish unit labor costs continued to rise by another 18% until the end of 2007, but shrank by 9% until the third quarter of 2008 after the real estate bubble burst. In Spain – which suffered a real estate bubble of its own – the increase in unit labor costs remained strong (+16%), but this was even topped by Greece (+18%). Strong unit labor cost increases were reported, again, for Hungary (+17%) and Slovakia (+10%) and now for Poland as well (+14%). Then there were a number of countries with increases of about 10%, namely France, Belgium, Luxembourg, Portugal, Finland and the United Kingdom.

During the global economic crisis (from the third quarter of 2008 until the third quarter of 2012), the increase of unit labor costs was substantial and more or less on a par in Austria (+10%) and Germany (+9%). This can be explained with the comparatively high wage increases agreed in wage negotia-

tions as well as with productivity losses resulting from the decline in economic output which went hand in hand with cuts in hours worked rather than sharp increases in layoffs. Those European countries which had built up comparatively high macroeconomic imbalances and/or unsustainable current account deficits by the time the economic crisis hit simply had to significantly improve their unit labor cost positions. Thus, Spain, Portugal and Greece reduced their total unit labor costs by about 5% each from the third quarter of 2008 until the third quarter of 2012; Ireland cut its unit labor costs by about 13% from late 2007 until the third quarter of 2012.

When we look at the period from early 1999 until the third quarter of 2012, total unit labor costs rose by 19% in Austria – compared with 10% for Germany, 35% for Italy, and some 30% each for France and Belgium. The Netherlands were affected to roughly the same degree, with an increase of about 33%. Those countries that were hit particularly hard by the global crisis plus, in some countries, the bursting

of a real estate bubble – namely Spain, Ireland, Greece and Portugal – have seen their unit labor costs rise by between 25% and 33% since 1999. Not surprisingly, even stronger increases were reported for some of the countries that joined the EU in 2004.

#### 4 Summary

The 2013 revision of the competitiveness indicators for Austria shows that domestic manufacturers have become more competitive internationally since the launch of the euro. A cross-check of different indices illustrates that indices deflated by producer prices reflect more significant gains than indices deflated by consumer prices (in the case of the latter, the improvements are, moreover, largely exchange rate-driven). When interpreting the diverging results, two arguments need to be borne in mind: First, it is safe to assume that producer price indices are a better proxy for price changes in tradable goods than consumer price indices. This would imply that domestic goods exporters have experienced marked competitiveness gains since the start of monetary union. Second, it must not be overlooked that the two indicators are based on different country samples with different country weights.

Furthermore, the aggregate price and cost competitiveness indicators (i.e. the aggregate results of the four subindices) reflect short-term gains in competitiveness for Austrian manufacturers and services providers from early 1999 until 2012, even if the improvements observed were not as strong for all economic areas as for the manufacturing industry.

Domestic providers of services have also been able to improve their competitiveness since the start of monetary union. With respect to services, the indicator of price competitiveness shows significantly higher competitiveness gains than the indicator of cost competitiveness, though. This becomes evident when we also take into account exchange rate changes, as the price competitiveness indicator reflects competitiveness gains despite an underlying nominal effective appreciation. Conversely, the improvement of cost competitiveness – as measured by the relative total unit labor costs – was supported somewhat by the underlying exchange rate changes. For Austria, we find total unit labor costs to have grown by 19% in the past 14 years. This is significantly below the corresponding results for Austria's major trading partners except Germany.

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## Appendix

Table A1

**Weighting Scheme of the New Exchange Rate Index**

Country weights in %, calculated for the period from 2007 to 2009

Competing countries	Austrian exports						Austrian imports					
	Manu- factured goods <sup>1</sup>	Raw materials, energy products	Food	Goods	Services	Total	Manu- factured goods	Raw materials, energy products	Food	Goods	Services	Total
Belgium	3.04	0.25	0.98	2.73	1.86	2.49	1.79	0.68	1.77	1.62	1.37	1.57
Bulgaria	0.38	0.68	0.61	0.41	0.55	0.45	0.29	0.04	0.16	0.24	0.72	0.34
Denmark	0.70	0.22	0.48	0.66	0.78	0.69	0.48	0.12	0.84	0.45	0.37	0.43
Germany	23.97	27.42	31.95	24.71	38.36	28.44	42.72	32.16	41.45	41.01	29.34	38.65
Estonia	0.07	0.02	0.10	0.07	0.14	0.09	0.03	0.02	0.04	0.03	0.14	0.05
Finland	0.79	0.03	0.22	0.70	0.70	0.70	0.60	0.25	0.05	0.51	0.69	0.55
France	5.59	1.13	2.19	5.08	2.41	4.36	3.59	0.52	3.81	3.13	2.58	3.02
Greece	0.41	0.44	0.91	0.44	0.46	0.45	0.10	0.07	0.66	0.14	1.55	0.42
United Kingdom	3.57	0.96	1.73	3.28	4.56	3.63	2.16	0.22	0.88	1.78	4.98	2.42
Ireland	0.69	0.05	0.19	0.62	0.51	0.59	0.54	0.03	0.85	0.49	0.68	0.52
Italy	8.23	18.50	16.00	9.38	5.50	8.32	7.08	3.94	10.56	6.82	6.95	6.84
Latvia	0.07	0.01	0.11	0.07	0.16	0.10	0.02	0.03	0.02	0.02	0.16	0.05
Lithuania	0.13	0.05	0.18	0.13	0.09	0.12	0.05	0.04	0.07	0.05	0.27	0.09
Luxembourg	0.16	0.02	0.14	0.15	0.40	0.22	0.17	0.00	0.04	0.14	0.58	0.23
Malta	0.02	0.06	0.07	0.02	0.11	0.05	0.02	0.01	0.00	0.01	0.12	0.04
Netherlands	2.64	0.75	2.65	2.53	4.43	3.04	2.72	1.97	6.05	2.82	2.52	2.76
Poland	2.61	0.82	1.67	2.44	1.77	2.26	1.35	2.40	3.39	1.65	2.58	1.83
Portugal	0.46	0.04	0.16	0.41	0.21	0.36	0.37	0.27	0.26	0.35	0.47	0.37
Romania	1.15	1.04	1.79	1.19	1.69	1.32	0.72	0.29	0.25	0.63	1.53	0.81
Sweden	1.44	0.17	0.87	1.33	1.48	1.37	1.44	0.43	0.20	1.21	0.96	1.16
Slovakia	1.13	3.90	1.37	1.32	1.54	1.38	1.64	4.31	1.10	2.02	2.84	2.18
Slovenia	0.84	3.89	3.78	1.22	1.23	1.22	1.10	0.56	0.80	1.00	1.68	1.14
Spain	2.99	0.34	1.60	2.73	1.03	2.27	1.63	0.25	3.43	1.53	1.97	1.62
Czech Republic	2.86	6.31	2.99	3.08	2.29	2.87	3.31	4.54	2.43	3.44	3.48	3.45
Hungary	1.85	6.55	3.67	2.26	3.31	2.55	2.21	3.58	4.04	2.54	4.15	2.86
Cyprus	0.01	0.02	0.14	0.02	0.28	0.09	0.02	0.00	0.06	0.02	0.38	0.09
Australia	0.51	0.16	0.66	0.50	0.29	0.44	0.06	0.09	0.11	0.07	0.29	0.11
Chile	0.13	0.00	0.04	0.11	0.08	0.10	0.01	0.03	0.28	0.03	0.04	0.03
Iceland	0.03	0.00	0.02	0.03	0.05	0.03	0.01	0.00	0.01	0.01	0.10	0.03
Israel	0.26	0.15	0.13	0.24	0.00	0.17	0.09	0.01	0.22	0.09	0.00	0.07
Japan	2.57	1.18	0.88	2.37	0.57	1.88	2.05	0.07	0.04	1.61	0.50	1.39
Canada	0.78	0.01	0.34	0.70	0.32	0.60	0.45	0.07	0.07	0.36	0.42	0.37
Mexico	0.56	0.01	0.17	0.50	0.11	0.39	0.19	0.03	0.10	0.16	0.11	0.15
New Zealand	0.07	0.00	0.09	0.06	0.04	0.06	0.03	0.01	0.34	0.05	0.13	0.06
Norway	0.50	0.03	0.16	0.45	0.43	0.44	0.19	0.01	0.14	0.16	0.46	0.22
Switzerland	2.55	3.12	3.35	2.64	6.10	3.58	4.25	0.83	3.33	3.67	4.27	3.79
South Korea	1.68	0.03	0.59	1.51	0.29	1.18	0.65	0.08	0.01	0.52	0.14	0.44
Turkey	1.35	0.10	0.30	1.20	0.74	1.08	0.86	0.18	1.27	0.78	1.39	0.90
U.S.A.	6.82	18.52	9.09	7.70	8.59	7.94	6.11	37.14	5.39	10.85	8.84	10.45
Bosnia and Herzegovina	0.14	0.18	0.54	0.17	0.29	0.21	0.19	0.24	0.04	0.19	0.23	0.20
Brazil	0.88	0.01	0.30	0.79	0.14	0.61	0.18	0.22	1.72	0.29	0.26	0.28
China	6.16	0.23	0.10	5.39	0.78	4.13	4.99	0.26	0.88	3.99	0.89	3.37
Hong Kong	0.81	0.02	0.10	0.72	0.25	0.59	0.15	0.00	0.00	0.12	0.54	0.21
India	0.96	0.04	0.07	0.84	0.29	0.69	0.43	0.04	0.34	0.37	0.42	0.38
Iran	0.25	0.02	0.06	0.22	0.00	0.16	0.01	0.74	0.05	0.13	0.00	0.10
Croatia	0.63	1.21	1.47	0.72	1.02	0.80	0.61	0.23	0.57	0.55	2.81	1.01
Malaysia	0.42	0.01	0.01	0.37	0.06	0.28	0.25	0.20	0.02	0.23	0.10	0.20
Russian Federation	2.22	0.32	2.37	2.12	1.97	2.08	0.31	1.13	0.07	0.42	2.38	0.82
Saudi Arabia	0.22	0.10	0.38	0.22	0.00	0.16	0.02	1.09	0.00	0.18	0.00	0.14
Serbia	0.32	0.23	0.73	0.34	0.69	0.44	0.22	0.14	0.62	0.23	0.51	0.29
Singapore	0.72	0.00	0.07	0.63	0.11	0.49	0.13	0.00	0.01	0.10	0.16	0.11
South Africa	0.57	0.01	0.40	0.52	0.14	0.42	0.10	0.25	0.40	0.14	0.53	0.22
Taiwan	0.70	0.05	0.03	0.61	0.08	0.47	0.63	0.00	0.00	0.49	0.12	0.42
Thailand	0.48	0.01	0.01	0.42	0.11	0.33	0.41	0.01	0.42	0.35	0.57	0.39
Ukraine	0.62	0.37	0.65	0.61	0.63	0.61	0.21	0.13	0.28	0.20	0.76	0.32
United Arab Emirates	0.31	0.22	0.37	0.31	0.00	0.22	0.02	0.02	0.00	0.02	0.00	0.02
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: OeNB/WIFO.

<sup>1</sup> Double weights.

Table A1 continued

**Weighting Scheme of the New Exchange Rate Index**

Country weights in %, calculated for the period from 2007 to 2009

Competing countries	Exports and imports					Total
	Manu- factured goods	Raw materials, energy products	Food	Goods	Services	
Belgium	2.43	0.56	1.38	2.16	1.66	2.04
Bulgaria	0.34	0.22	0.39	0.33	0.62	0.40
Denmark	0.59	0.15	0.66	0.55	0.61	0.57
Germany	33.00	30.84	36.72	33.01	34.68	33.35
Estonia	0.05	0.02	0.07	0.05	0.14	0.07
Finland	0.70	0.19	0.13	0.61	0.70	0.63
France	4.63	0.69	3.01	4.09	2.48	3.71
Greece	0.26	0.18	0.79	0.29	0.90	0.43
United Kingdom	2.89	0.43	1.30	2.52	4.73	3.05
Ireland	0.62	0.04	0.52	0.55	0.58	0.56
Italy	7.67	8.00	13.27	8.08	6.09	7.61
Latvia	0.05	0.03	0.07	0.05	0.16	0.07
Lithuania	0.09	0.05	0.13	0.09	0.16	0.11
Luxembourg	0.17	0.01	0.09	0.14	0.47	0.22
Malta	0.02	0.02	0.04	0.02	0.11	0.04
Netherlands	2.68	1.63	4.36	2.68	3.65	2.91
Poland	2.00	1.96	2.54	2.03	2.10	2.05
Portugal	0.42	0.21	0.21	0.38	0.32	0.37
Romania	0.95	0.50	1.02	0.90	1.62	1.08
Sweden	1.44	0.36	0.53	1.26	1.27	1.27
Slovakia	1.38	4.20	1.23	1.67	2.07	1.77
Slovenia	0.96	1.49	2.28	1.11	1.41	1.18
Spain	2.33	0.27	2.52	2.12	1.42	1.96
Czech Republic	3.08	5.04	2.71	3.27	2.78	3.15
Hungary	2.02	4.41	3.86	2.40	3.65	2.70
Cyprus	0.02	0.01	0.10	0.02	0.32	0.09
Australia	0.29	0.11	0.39	0.28	0.29	0.28
Chile	0.07	0.02	0.16	0.07	0.06	0.07
Iceland	0.02	0.00	0.01	0.02	0.07	0.03
Israel	0.18	0.05	0.17	0.16	0.00	0.13
Japan	2.32	0.38	0.46	1.98	0.54	1.64
Canada	0.62	0.05	0.20	0.53	0.36	0.49
Mexico	0.38	0.02	0.13	0.32	0.11	0.27
New Zealand	0.05	0.01	0.22	0.05	0.08	0.06
Norway	0.35	0.02	0.15	0.30	0.44	0.34
Switzerland	3.37	1.47	3.34	3.16	5.35	3.68
South Korea	1.19	0.07	0.30	1.01	0.23	0.82
Turkey	1.11	0.16	0.79	0.99	1.00	0.99
U.S.A.	6.48	31.94	7.23	9.31	8.69	9.15
Bosnia and Herzegovina	0.17	0.23	0.29	0.18	0.27	0.20
Brazil	0.55	0.16	1.02	0.53	0.19	0.45
China	5.60	0.25	0.49	4.68	0.82	3.76
Hong Kong	0.50	0.01	0.05	0.41	0.37	0.40
India	0.71	0.04	0.21	0.60	0.34	0.54
Iran	0.13	0.54	0.06	0.17	0.00	0.13
Croatia	0.62	0.50	1.01	0.63	1.75	0.90
Malaysia	0.34	0.15	0.02	0.30	0.08	0.25
Russian Federation	1.30	0.90	1.21	1.25	2.14	1.47
Saudi Arabia	0.12	0.81	0.19	0.20	0.00	0.15
Serbia	0.27	0.17	0.67	0.29	0.62	0.37
Singapore	0.43	0.00	0.04	0.36	0.13	0.31
South Africa	0.34	0.18	0.40	0.33	0.30	0.32
Taiwan	0.66	0.02	0.02	0.55	0.10	0.44
Thailand	0.45	0.01	0.22	0.38	0.30	0.36
Ukraine	0.42	0.20	0.46	0.40	0.69	0.47
United Arab Emirates	0.17	0.07	0.18	0.16	0.00	0.12
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: OeNB/WIFO.

Table A2

**Competition Matrix for Manufactured Goods Exports**

Market shares in %; calculated for the period from 2007 to 2009

Competing countries	Destinations														
	Belgium	Bulgaria	Denmark	Germany	Estonia	Finland	France	Greece	United Kingdom	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta
Belgium	13.16	1.97	3.46	4.57	2.13	1.75	5.66	2.75	3.46	2.47	1.83	1.85	2.72	15.70	1.22
Bulgaria	0.33	38.25	0.05	0.11	0.05	0.02	0.07	1.13	0.05	0.02	0.15	0.14	0.14	0.04	0.13
Denmark	0.37	0.45	25.82	0.68	1.75	1.32	0.31	0.40	0.58	1.15	0.18	1.99	1.72	0.19	1.16
Germany	18.53	10.26	17.97	54.16	12.82	7.77	10.95	8.84	10.06	6.53	6.76	12.07	12.35	16.34	5.37
Estonia	0.03	0.02	0.25	0.03	18.52	1.08	0.01	0.01	0.02	0.02	0.01	5.61	2.11	0.01	0.01
Finland	0.51	0.37	1.48	0.46	12.01	56.49	0.24	0.36	0.49	0.31	0.22	3.52	2.03	0.11	0.23
France	9.60	2.74	3.31	4.21	2.06	1.70	53.69	4.03	4.19	2.94	3.34	1.86	2.74	6.90	8.23
Greece	0.06	4.20	0.14	0.11	0.05	0.02	0.06	47.20	0.10	0.08	0.13	0.10	0.06	0.03	0.37
United Kingdom	5.58	1.14	3.73	2.29	2.07	1.81	2.30	2.19	46.93	23.53	1.37	1.46	2.17	1.44	5.47
Ireland	6.06	0.23	0.62	0.51	0.30	0.24	0.60	0.51	1.87	32.99	0.34	0.35	0.14	0.36	0.18
Italy	3.95	7.84	3.23	3.46	3.39	1.59	4.90	8.71	2.88	1.89	69.94	3.26	4.18	2.11	9.25
Latvia	0.02	0.03	0.25	0.03	5.93	0.09	0.01	0.01	0.02	0.05	0.01	23.22	4.64	0.01	0.02
Lithuania	0.07	0.07	0.64	0.08	3.41	0.11	0.05	0.01	0.06	0.04	0.02	7.83	28.81	0.12	0.08
Luxembourg	0.52	0.07	0.16	0.22	0.09	0.06	0.24	0.05	0.09	0.05	0.07	0.07	0.09	30.55	0.04
Malta	0.00	0.01	0.02	0.02	0.00	0.03	0.03	0.00	0.03	0.01	0.01	0.00	0.00	0.00	5.24
Netherlands	9.20	1.78	4.61	3.88	2.54	2.11	2.63	2.38	3.24	3.00	1.58	2.30	2.46	3.48	1.96
Poland	1.10	1.58	2.37	2.09	4.65	0.67	0.87	0.66	1.01	0.44	0.85	6.30	8.32	0.91	0.21
Portugal	0.32	0.10	0.33	0.38	0.13	0.09	0.52	0.15	0.29	0.24	0.13	0.16	0.07	0.21	0.18
Romania	0.22	2.74	0.10	0.47	0.16	0.06	0.32	0.53	0.19	0.12	0.60	0.15	0.17	0.08	0.29
Sweden	1.93	0.54	9.50	0.85	8.25	5.83	0.65	0.60	0.99	0.66	0.42	3.25	2.82	0.40	0.25
Slovakia	0.36	1.06	0.59	0.79	0.42	0.36	0.43	0.39	0.38	0.12	0.34	1.03	0.63	0.15	0.08
Slovenia	0.09	0.81	0.26	0.32	0.23	0.06	0.19	0.11	0.08	0.04	0.24	0.25	0.43	0.16	0.06
Spain	1.94	1.23	1.48	1.44	0.85	0.52	3.95	2.58	1.85	1.12	1.57	0.73	0.92	1.09	1.96
Czech Republic	1.10	2.00	1.10	2.33	1.34	0.53	0.68	0.46	0.78	0.34	0.52	1.60	1.90	0.61	0.26
Hungary	0.44	2.69	0.70	1.46	0.76	0.29	0.41	0.42	0.53	0.41	0.38	1.06	1.01	0.32	0.08
Cyprus	0.00	0.04	0.00	0.01	0.01	0.00	0.00	0.25	0.01	0.01	0.00	0.01	0.02	0.00	0.06
Australia	0.13	0.05	0.06	0.04	0.02	0.06	0.03	0.04	0.18	0.08	0.03	0.04	0.01	0.00	0.06
Chile	0.19	0.00	0.02	0.02	0.00	0.02	0.16	0.18	0.01	0.00	0.22	0.00	0.00	0.00	0.02
Iceland	0.00	0.01	0.03	0.03	0.01	0.00	0.00	0.00	0.01	0.18	0.00	0.00	0.01	0.01	0.02
Israel	1.16	0.19	0.13	0.09	0.08	0.08	0.10	0.27	0.19	0.09	0.11	0.19	0.10	0.06	0.45
Japan	2.25	0.43	0.65	1.30	0.73	1.41	0.75	1.15	1.67	1.22	0.59	0.45	0.40	0.54	2.83
Canada	0.57	0.11	0.32	0.14	0.14	0.19	0.21	0.08	0.73	0.42	0.11	0.25	0.18	0.58	0.29
Mexico	0.21	0.04	0.09	0.26	0.02	0.26	0.05	0.02	0.10	0.19	0.03	0.00	0.08	0.03	0.02
New Zealand	0.02	0.00	0.03	0.01	0.00	0.01	0.01	0.00	0.04	0.02	0.01	0.01	0.01	0.00	0.04
Norway	0.30	0.06	1.99	0.26	0.70	0.60	0.12	0.14	0.33	0.41	0.08	0.44	0.55	0.17	0.23
Switzerland	1.10	0.99	1.25	2.16	0.60	0.65	1.40	1.49	1.14	0.79	1.25	1.52	0.64	0.97	1.50
South Korea	0.86	0.52	0.51	0.67	0.62	1.05	0.35	2.26	0.71	0.74	0.34	0.83	0.49	0.08	18.38
Turkey	0.51	5.85	0.93	0.67	1.16	0.19	0.60	1.83	0.91	0.58	0.58	0.57	0.96	0.19	7.92
U.S.A.	7.44	0.91	2.42	2.79	1.36	1.78	2.26	1.72	4.86	8.14	1.04	2.04	2.64	3.40	1.86
Bosnia and Herzegovina	0.01	0.03	0.00	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.01	0.08	0.00
Brazil	0.42	0.02	0.14	0.23	0.20	0.12	0.12	0.08	0.19	0.17	0.17	0.04	0.17	0.08	0.03
China	4.08	3.08	5.30	3.34	4.06	4.60	2.17	3.78	4.27	4.00	2.18	5.26	4.27	11.36	11.81
Hong Kong	0.66	0.21	0.91	0.72	0.87	0.79	0.45	0.31	1.19	0.40	0.40	0.65	0.30	0.35	0.34
India	1.21	0.21	0.58	0.33	0.25	0.15	0.24	0.37	0.70	0.30	0.33	0.30	0.23	0.04	0.60
Iran	0.09	0.06	0.01	0.01	0.00	0.00	0.01	0.03	0.01	0.00	0.04	0.00	0.00	0.00	0.00
Croatia	0.02	0.15	0.04	0.08	0.02	0.01	0.03	0.02	0.03	0.02	0.16	0.04	0.06	0.03	2.51
Malaysia	0.17	0.08	0.15	0.24	0.16	0.30	0.15	0.12	0.30	0.41	0.07	0.18	0.08	0.02	0.42
Russian Federation	0.56	1.45	0.73	0.24	2.95	2.01	0.05	0.34	0.16	0.10	0.36	5.25	3.96	0.15	2.26
Saudi Arabia	0.29	0.01	0.00	0.01	0.00	0.00	0.03	0.06	0.06	0.00	0.05	0.01	0.00	0.00	1.96
Serbia	0.02	0.60	0.01	0.05	0.02	0.01	0.02	0.12	0.02	0.01	0.09	0.07	0.07	0.00	0.01
Singapore	0.64	0.03	0.10	0.33	0.00	0.19	0.30	0.05	0.58	1.70	0.04	0.05	0.04	0.08	2.81
South Africa	0.41	0.02	0.04	0.24	0.03	0.04	0.09	0.08	0.42	0.11	0.07	0.03	0.02	0.16	0.08
Taiwan	0.34	0.51	0.65	0.48	0.77	0.47	0.35	0.29	0.60	0.83	0.24	0.34	0.36	0.19	0.79
Thailand	0.46	0.08	0.51	0.16	0.31	0.29	0.14	0.29	0.33	0.46	0.13	0.17	0.48	0.05	0.15
Ukraine	0.04	2.02	0.18	0.09	0.95	0.03	0.02	0.08	0.04	0.01	0.17	1.03	1.04	0.01	0.09
United Arab Emirates	0.34	0.05	0.02	0.02	0.02	0.07	0.02	0.03	0.05	0.03	0.04	0.06	0.17	0.06	0.14
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Single export weights	1.56	0.63	0.68	29.61	0.10	0.54	3.81	0.54	3.34	0.25	6.36	0.14	0.13	0.12	0.03

Source: OeNB/WIFO.

**Competition Matrix for Manufactured Goods Exports**

Market shares in %; calculated for the period from 2007 to 2009

Competing countries	Destinations													
	Netherlands	Poland	Portugal	Romania	Sweden	Slovakia	Slovenia	Spain	Czech Republic	Hungary	Cyprus	Australia	Chile	Iceland
Belgium	9.83	2.55	2.21	1.64	2.56	1.69	2.31	2.02	2.40	2.15	1.73	0.54	0.83	1.81
Bulgaria	0.05	0.12	0.02	1.13	0.04	0.23	0.33	0.05	0.08	0.17	0.25	0.00	0.01	0.01
Denmark	0.86	0.71	0.26	0.24	3.49	0.43	0.33	0.31	0.38	0.54	0.41	0.18	0.27	7.73
Germany	18.34	18.16	8.65	12.27	11.02	17.89	17.45	7.84	21.52	20.99	7.55	2.74	3.93	10.83
Estonia	0.04	0.07	0.01	0.01	0.58	0.03	0.02	0.01	0.03	0.03	0.02	0.00	0.00	0.39
Finland	1.21	0.68	0.36	0.30	2.88	0.28	0.54	0.31	0.30	0.46	1.54	0.19	0.46	1.12
France	4.53	3.45	5.30	4.42	3.03	4.58	5.72	5.90	2.88	3.80	2.69	1.20	1.68	1.63
Greece	0.10	0.08	0.10	1.01	0.06	0.06	0.15	0.06	0.05	0.10	9.48	0.01	0.02	0.05
United Kingdom	4.73	1.84	1.70	1.42	3.39	1.21	1.29	2.01	1.75	1.58	5.24	1.46	0.79	5.32
Ireland	1.09	0.36	0.42	0.42	0.43	0.16	0.14	0.67	0.31	0.26	0.36	0.31	0.10	0.49
Italy	2.96	5.20	4.57	9.10	2.14	4.31	13.74	4.11	3.27	4.56	8.02	1.12	1.62	2.42
Latvia	0.03	0.11	0.00	0.02	0.13	0.05	0.02	0.00	0.03	0.02	0.08	0.00	0.00	0.61
Lithuania	0.07	0.30	0.03	0.05	0.26	0.05	0.05	0.02	0.09	0.07	0.03	0.00	0.00	0.45
Luxembourg	0.23	0.11	0.06	0.08	0.10	0.10	0.13	0.06	0.11	0.09	0.07	0.01	0.02	0.13
Malta	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.00	0.00	0.08
Netherlands	4.57	2.93	2.29	1.90	2.70	1.83	2.27	1.80	3.58	3.02	2.00	0.46	0.77	7.35
Poland	1.45	42.50	0.46	2.23	1.88	4.46	1.62	0.57	4.41	3.79	1.12	0.07	0.08	1.26
Portugal	0.30	0.14	47.46	0.27	0.18	0.13	0.11	1.55	0.16	0.18	0.29	0.02	0.18	0.11
Romania	0.29	0.39	0.10	39.42	0.14	0.75	0.78	0.14	0.44	1.95	0.20	0.01	0.04	0.08
Sweden	1.74	1.26	0.53	0.46	51.86	0.48	0.68	0.52	0.68	0.61	0.76	0.57	0.69	5.36
Slovakia	0.57	1.41	0.20	1.32	0.45	22.90	1.61	0.25	4.23	3.05	0.44	0.04	0.10	0.11
Slovenia	0.13	0.37	0.07	0.55	0.11	0.65	26.01	0.06	0.45	0.80	0.12	0.01	0.01	0.09
Spain	1.59	1.25	16.14	1.55	0.82	1.04	2.07	62.00	1.16	1.29	2.36	0.40	2.11	1.46
Czech Republic	1.40	2.85	0.41	2.05	1.00	14.80	2.24	0.48	38.18	3.46	0.39	0.07	0.11	0.64
Hungary	0.72	1.41	0.39	4.48	0.41	6.01	2.41	0.42	2.11	25.83	0.31	0.06	0.03	0.26
Cyprus	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.00	14.01	0.00	0.00	0.01
Australia	0.14	0.01	0.01	0.01	0.04	0.01	0.04	0.02	0.01	0.01	0.05	62.29	0.21	0.05
Chile	0.64	0.00	0.00	0.00	0.03	0.00	0.00	0.09	0.00	0.00	0.00	0.10	39.06	0.00
Iceland	0.37	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	34.00
Israel	0.35	0.08	0.08	0.23	0.06	0.04	0.27	0.14	0.09	0.13	4.18	0.17	0.18	0.07
Japan	5.06	0.74	0.63	0.40	0.75	0.70	0.66	0.66	1.67	2.40	4.63	4.24	3.34	1.73
Canada	0.60	0.10	0.10	0.09	0.15	0.04	0.19	0.10	0.12	0.23	0.10	0.40	0.86	1.05
Mexico	0.41	0.04	0.03	0.04	0.03	0.01	0.03	0.07	0.05	0.15	0.02	0.16	2.42	0.03
New Zealand	0.03	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.99	0.06	0.02
Norway	0.98	0.31	0.20	0.17	1.73	0.09	0.05	0.16	0.09	0.08	0.18	0.06	0.19	4.55
Switzerland	1.52	0.84	0.85	0.96	0.71	0.84	1.27	0.98	1.07	1.09	0.63	0.58	0.43	0.46
South Korea	0.89	1.77	0.39	0.89	0.38	5.61	2.27	0.46	0.62	1.88	10.17	1.31	3.47	0.57
Turkey	0.68	0.59	0.45	4.05	0.35	0.44	2.11	0.56	0.40	0.67	4.83	0.07	0.17	0.17
U.S.A.	8.31	1.15	1.51	0.73	1.89	0.67	0.79	1.18	0.75	1.34	1.17	5.70	14.59	4.47
Bosnia and Herzegovina	0.01	0.01	0.01	0.02	0.01	0.03	1.30	0.00	0.01	0.12	0.00	0.00	0.00	0.00
Brazil	0.94	0.08	0.42	0.07	0.13	0.03	0.13	0.16	0.03	0.08	0.05	0.18	5.97	0.02
China	12.13	3.36	1.87	3.22	2.16	2.89	3.09	2.66	3.51	6.06	8.15	6.49	11.93	1.67
Hong Kong	1.66	0.28	0.23	0.31	0.46	0.27	0.24	0.34	0.45	1.18	0.37	1.54	0.84	0.22
India	0.72	0.18	0.35	0.42	0.23	0.07	0.46	0.31	0.12	0.33	0.53	0.36	0.69	0.27
Iran	0.06	0.01	0.01	0.07	0.00	0.00	0.03	0.02	0.00	0.00	0.01	0.01	0.00	0.00
Croatia	0.04	0.04	0.01	0.08	0.04	0.10	2.66	0.01	0.07	0.17	0.59	0.00	0.00	0.01
Malaysia	1.34	0.13	0.10	0.06	0.12	0.20	0.06	0.09	0.12	0.40	0.19	1.15	0.16	0.05
Russian Federation	2.09	0.52	0.44	0.37	0.22	0.71	0.22	0.06	0.36	0.61	2.44	0.02	0.04	0.06
Saudi Arabia	0.17	0.02	0.01	0.01	0.02	0.00	0.00	0.04	0.01	0.00	0.09	0.09	0.01	0.01
Serbia	0.04	0.05	0.02	0.36	0.01	0.24	1.31	0.01	0.07	0.20	0.05	0.00	0.00	0.01
Singapore	1.56	0.12	0.10	0.04	0.06	0.08	0.10	0.06	0.29	0.80	0.30	1.60	0.10	0.00
South Africa	0.35	0.12	0.11	0.06	0.13	0.00	0.09	0.14	0.05	0.04	0.04	0.35	0.13	0.09
Taiwan	0.89	0.52	0.13	0.22	0.37	1.89	0.47	0.30	0.83	1.85	0.37	0.83	0.69	0.49
Thailand	0.95	0.17	0.14	0.09	0.19	0.24	0.08	0.14	0.45	0.38	0.33	1.80	0.50	0.11
Ukraine	0.12	0.49	0.01	0.59	0.03	0.65	0.06	0.04	0.13	0.92	0.61	0.01	0.11	0.02
United Arab Emirates	0.08	0.01	0.00	0.05	0.01	0.00	0.01	0.01	0.02	0.03	0.42	0.04	0.01	0.01
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Single export weights	1.66	2.67	0.38	1.91	1.13	1.75	1.77	2.56	3.39	3.04	0.06	0.65	0.09	0.02

Source: OeNB/WIFO.

Table A2 continued

**Competition Matrix for Manufactured Goods Exports**

Market shares in %; calculated for the period from 2007 to 2009

Competing countries	Destinations														
	Israel	Japan	Canada	Mexico	New Zealand	Norway	Switzerland	South Korea	Turkey	U.S.A.	Bosnia and Herzegovina	Brazil	China	Hong Kong	India
Belgium	4.30	0.12	0.49	0.24	0.46	1.35	2.83	0.13	1.26	0.41	1.02	0.36	0.11	0.73	1.01
Bulgaria	0.05	0.00	0.01	0.00	0.00	0.03	0.06	0.00	0.34	0.00	0.65	0.01	0.00	0.01	0.01
Denmark	0.15	0.03	0.11	0.05	0.30	4.04	0.37	0.05	0.15	0.10	0.23	0.06	0.04	0.06	0.04
Germany	4.86	0.72	1.45	2.03	2.38	7.72	23.70	1.25	5.84	1.84	12.79	1.82	1.16	1.64	1.52
Estonia	0.01	0.00	0.00	0.00	0.00	0.27	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00
Finland	0.27	0.03	0.07	0.05	0.17	1.95	0.35	0.08	0.24	0.09	0.09	0.14	0.07	0.05	0.09
France	2.11	0.27	0.54	0.53	0.85	1.56	6.44	0.41	2.20	0.57	1.25	0.73	0.28	0.88	0.61
Greece	0.16	0.00	0.01	0.00	0.01	0.03	0.13	0.00	0.16	0.01	0.39	0.01	0.00	0.01	0.01
United Kingdom	2.99	0.27	0.79	0.30	1.41	3.33	3.76	0.31	1.13	0.91	0.47	0.42	0.17	1.55	0.72
Ireland	0.36	0.11	0.09	0.16	0.24	0.38	2.08	0.06	0.17	0.47	0.23	0.05	0.05	0.26	0.03
Italy	2.99	0.23	0.50	0.72	1.09	1.61	8.76	0.37	2.72	0.53	10.04	0.70	0.23	1.23	0.59
Latvia	0.01	0.00	0.00	0.00	0.01	0.15	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Lithuania	0.01	0.00	0.00	0.00	0.01	0.33	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.02
Luxembourg	0.03	0.00	0.01	0.02	0.01	0.05	0.11	0.01	0.04	0.01	0.02	0.01	0.01	0.02	0.01
Malta	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00
Netherlands	2.00	0.11	0.22	0.20	0.48	2.77	2.49	0.30	1.26	0.28	1.33	0.21	0.10	0.33	0.26
Poland	0.37	0.01	0.10	0.04	0.05	2.04	0.56	0.03	0.49	0.04	1.13	0.05	0.03	0.04	0.03
Portugal	0.13	0.01	0.02	0.04	0.02	0.09	0.16	0.00	0.06	0.03	0.15	0.03	0.00	0.02	0.01
Romania	0.14	0.00	0.01	0.01	0.00	0.40	0.13	0.01	0.53	0.01	1.06	0.01	0.00	0.01	0.05
Sweden	0.47	0.07	0.23	0.15	0.35	10.95	0.70	0.10	0.44	0.20	0.50	0.20	0.09	0.14	0.23
Slovakia	0.06	0.00	0.02	0.02	0.03	0.12	0.27	0.01	0.25	0.02	0.97	0.01	0.02	0.01	0.01
Slovenia	0.04	0.00	0.01	0.01	0.01	0.05	0.12	0.00	0.06	0.01	9.76	0.01	0.00	0.01	0.01
Spain	1.24	0.05	0.14	0.71	0.31	0.70	1.62	0.06	1.23	0.15	0.64	0.32	0.06	0.17	0.15
Czech Republic	0.52	0.02	0.03	0.05	0.08	0.50	1.01	0.03	0.24	0.05	2.13	0.05	0.02	0.09	0.09
Hungary	0.37	0.02	0.04	0.06	0.04	0.20	0.45	0.03	0.39	0.04	2.73	0.02	0.03	0.05	0.02
Cyprus	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Australia	0.10	0.10	0.07	0.05	12.30	0.03	0.07	0.23	0.04	0.09	0.00	0.03	0.06	0.38	0.10
Chile	0.01	0.02	0.15	0.26	0.02	0.01	0.04	0.21	0.09	0.08	0.00	0.37	0.16	0.03	0.01
Iceland	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Israel	39.04	0.02	0.12	0.06	0.11	0.04	0.57	0.07	0.34	0.37	0.03	0.14	0.02	0.98	0.27
Japan	2.37	86.71	1.74	2.06	4.33	0.96	1.16	5.37	0.78	2.49	0.03	0.82	2.66	9.26	0.93
Canada	0.50	0.09	49.24	0.78	0.64	0.31	0.37	0.12	0.11	3.63	0.05	0.22	0.11	0.25	0.17
Mexico	0.10	0.04	1.05	56.46	0.07	0.03	0.07	0.04	0.01	3.40	0.01	0.46	0.03	0.07	0.06
New Zealand	0.03	0.04	0.01	0.01	54.08	0.03	0.01	0.02	0.00	0.02	0.00	0.01	0.01	0.04	0.01
Norway	0.05	0.04	0.03	0.01	0.05	49.74	0.15	0.17	0.08	0.05	0.04	0.04	0.04	0.04	0.07
Switzerland	1.30	0.28	0.41	0.27	0.47	0.62	27.39	0.19	0.65	0.36	0.92	0.34	0.13	1.48	0.31
South Korea	1.28	0.92	0.66	1.88	1.35	1.20	0.20	77.42	1.12	0.84	0.24	0.80	2.08	4.90	1.06
Turkey	2.24	0.01	0.06	0.03	0.10	0.30	0.27	0.01	68.82	0.06	3.42	0.05	0.01	0.05	0.05
U.S.A.	15.69	1.88	35.67	26.24	4.94	2.11	5.50	2.65	1.27	74.23	0.30	4.21	1.17	5.18	2.04
Bosnia and Herzegovina	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	23.83	0.00	0.00	0.00	0.00
Brazil	0.13	0.07	0.17	0.85	0.08	0.07	0.33	0.11	0.11	0.30	0.04	83.04	0.06	0.10	0.08
China	5.48	4.25	3.49	2.94	5.43	2.06	1.84	6.15	3.02	4.81	0.81	2.55	82.61	51.29	4.10
Hong Kong	2.10	0.68	0.60	0.37	1.23	0.29	1.09	0.69	0.21	0.91	0.03	0.25	4.35	4.91	0.89
India	2.00	0.06	0.20	0.13	0.40	0.21	0.32	0.14	0.43	0.38	0.06	0.22	0.08	1.83	80.01
Iran	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.04	0.16	0.00	0.02	0.00	0.03	0.00	0.10
Croatia	0.01	0.00	0.00	0.00	0.00	0.02	0.05	0.00	0.02	0.01	11.07	0.00	0.00	0.00	0.00
Malaysia	0.00	0.39	0.14	0.30	1.14	0.08	0.09	0.28	0.17	0.43	0.01	0.09	0.29	2.00	0.36
Russian Federation	0.63	0.10	0.02	0.09	0.01	0.31	1.97	0.11	1.35	0.10	0.12	0.23	0.12	0.04	0.49
Saudi Arabia	0.00	0.01	0.00	0.00	0.23	0.01	0.05	0.06	0.18	0.02	0.00	0.01	0.04	0.13	0.15
Serbia	0.02	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	10.26	0.00	0.00	0.00	0.00
Singapore	0.67	0.54	0.39	0.29	1.89	0.06	0.31	1.22	0.09	0.46	0.00	0.24	0.64	6.92	1.21
South Africa	0.67	0.24	0.06	0.03	0.20	0.05	0.85	0.08	0.07	0.13	0.00	0.07	0.04	0.11	0.12
Taiwan	0.92	0.75	0.62	1.26	1.15	0.54	0.32	1.10	0.50	0.70	0.26	0.40	2.49	0.00	0.31
Thailand	0.74	0.60	0.15	0.19	1.33	0.10	0.45	0.22	0.23	0.31	0.01	0.15	0.29	2.30	0.40
Ukraine	0.26	0.00	0.02	0.04	0.01	0.11	0.04	0.04	0.83	0.02	0.81	0.05	0.01	0.01	0.11
United Arab Emirates	0.00	0.03	0.01	0.00	0.11	0.01	0.30	0.01	0.06	0.02	0.02	0.01	0.01	0.31	1.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Single export weights	0.16	0.76	0.79	0.33	0.08	0.56	4.69	0.51	0.77	4.71	0.28	0.60	1.83	0.38	0.55

Source: OeNB/WIFO.

**Competition Matrix for Manufactured Goods Exports**

Market shares in %; calculated for the period from 2007 to 2009

Competing countries	Destinations													Double export weights
	Iran	Croatia	Malaysia	Russian Federation	Saudi Arabia	Serbia	Singapore	South Africa	Taiwan	Thailand	Ukraine	United Arab Emirates	Rest of the world	
Belgium	0.41	1.02	0.25	0.66	1.15	1.09	0.34	0.99	0.17	0.48	0.77	1.45	1.57	3.04
Bulgaria	0.04	0.23	0.01	0.08	0.01	2.17	0.00	0.00	0.00	0.01	0.16	0.01	0.13	0.38
Denmark	0.12	0.49	0.05	0.18	0.18	0.25	0.24	0.14	0.05	0.11	0.25	0.17	0.86	0.70
Germany	4.44	12.95	3.19	6.57	5.99	10.67	3.55	6.30	1.87	1.85	7.40	5.49	11.41	23.97
Estonia	0.00	0.01	0.00	0.26	0.01	0.01	0.00	0.00	0.00	0.00	0.13	0.01	0.03	0.07
Finland	0.14	0.29	0.13	1.47	0.66	0.26	0.17	0.39	0.11	0.10	0.70	0.53	0.73	0.79
France	1.99	1.88	1.20	1.41	2.58	1.92	2.65	1.40	0.51	0.82	1.21	2.91	4.88	5.59
Greece	0.01	0.23	0.00	0.06	0.04	1.29	0.02	0.04	0.00	0.00	0.08	0.15	0.21	0.41
United Kingdom	0.64	1.16	0.92	0.98	3.20	0.85	2.18	2.47	0.37	0.68	0.93	3.48	2.04	3.57
Ireland	0.04	0.22	0.75	0.06	0.35	0.37	0.35	0.28	0.11	0.12	0.05	0.25	0.24	0.69
Italy	2.65	11.98	0.60	2.26	3.71	8.10	1.08	1.24	0.37	0.73	2.75	3.82	4.96	8.23
Latvia	0.00	0.01	0.00	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.11	0.00	0.05	0.07
Lithuania	0.00	0.02	0.01	0.37	0.00	0.02	0.00	0.00	0.00	0.00	0.27	0.01	0.15	0.13
Luxembourg	0.02	0.03	0.01	0.03	0.04	0.04	0.01	0.02	0.01	0.01	0.02	0.04	0.05	0.16
Malta	0.00	0.01	0.01	0.00	0.01	0.00	0.19	0.00	0.00	0.01	0.00	0.01	0.02	0.02
Netherlands	0.46	1.80	0.36	1.12	1.43	1.91	1.05	1.09	0.57	0.52	1.41	1.49	1.79	2.64
Poland	0.11	1.44	0.09	1.15	0.20	1.05	0.06	0.21	0.03	0.05	5.02	0.31	0.67	2.61
Portugal	0.03	0.06	0.24	0.03	0.07	0.04	0.41	0.05	0.01	0.01	0.03	0.05	0.45	0.46
Romania	0.14	0.23	0.01	0.14	0.04	1.72	0.04	0.03	0.01	0.01	0.44	0.12	0.30	1.15
Sweden	0.44	0.68	0.29	0.56	0.89	0.85	0.46	0.65	0.11	0.21	0.59	0.36	0.81	1.44
Slovakia	0.01	0.84	0.02	0.37	0.04	1.88	0.02	0.06	0.01	0.01	0.73	0.07	0.32	1.13
Slovenia	0.06	6.65	0.01	0.18	0.02	4.87	0.01	0.02	0.00	0.01	0.32	0.04	0.28	0.84
Spain	0.54	1.06	0.21	0.46	1.01	0.80	0.28	0.60	0.11	0.21	0.41	0.77	2.10	2.99
Czech Republic	0.04	1.99	0.04	0.58	0.16	1.94	0.07	0.21	0.02	0.05	1.25	0.37	0.74	2.86
Hungary	0.03	3.29	0.03	0.57	0.23	4.31	0.10	0.21	0.01	0.03	1.75	0.40	0.54	1.85
Cyprus	0.01	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01
Australia	0.06	0.01	0.80	0.01	0.92	0.01	0.62	0.62	0.51	0.95	0.01	0.50	0.53	0.51
Chile	0.00	0.00	0.02	0.00	0.01	0.00	0.04	0.05	0.46	0.04	0.00	0.00	0.43	0.13
Iceland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03
Israel	0.00	0.07	0.03	0.08	0.00	0.19	0.22	0.24	0.12	0.25	0.13	0.02	0.42	0.26
Japan	1.48	0.23	8.25	1.92	6.24	0.10	8.85	2.77	12.56	15.47	1.31	5.35	6.87	2.57
Canada	0.11	0.20	0.30	0.15	0.42	0.05	0.35	0.31	0.18	0.22	0.11	0.42	0.63	0.78
Mexico	0.01	0.01	0.06	0.02	0.11	0.01	0.15	0.10	0.06	0.07	0.01	0.06	1.27	0.56
New Zealand	0.01	0.00	0.05	0.00	0.03	0.00	0.09	0.04	0.03	0.04	0.00	0.03	0.09	0.07
Norway	0.03	0.25	0.08	0.04	0.12	0.04	0.55	0.05	0.03	0.03	0.03	0.20	0.23	0.50
Switzerland	0.55	0.96	0.32	0.44	1.26	1.15	0.98	0.46	0.41	0.57	0.49	1.33	1.36	2.55
South Korea	3.61	0.44	3.21	1.34	4.07	0.26	5.62	0.92	3.49	2.97	1.39	2.90	5.65	1.68
Turkey	1.51	0.92	0.04	0.72	1.27	2.98	0.11	0.18	0.02	0.04	1.40	2.44	2.21	1.35
U.S.A.	0.07	0.56	6.34	1.05	9.34	0.56	11.28	3.21	5.86	3.89	1.03	7.01	9.64	6.82
Bosnia and Herzegovina	0.00	1.93	0.00	0.00	0.00	1.63	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.14
Brazil	0.16	0.03	0.12	0.06	0.32	0.02	0.37	0.75	0.19	0.30	0.07	0.32	3.09	0.88
China	7.30	5.54	11.46	4.77	8.57	1.98	14.81	5.37	7.04	8.14	6.26	12.62	15.11	6.16
Hong Kong	0.09	0.18	1.89	0.17	0.48	0.12	3.24	0.52	2.01	2.32	0.21	1.70	1.54	0.81
India	0.90	0.22	1.08	0.14	2.00	0.06	1.77	0.85	0.18	0.87	0.35	8.74	2.15	0.96
Iran	61.63	0.01	0.04	0.02	0.31	0.02	0.02	0.01	0.00	0.09	0.03	0.23	0.43	0.25
Croatia	0.00	37.71	0.00	0.03	0.01	2.45	0.04	0.03	0.00	0.00	0.05	0.02	0.15	0.63
Malaysia	0.29	0.07	31.86	0.07	0.63	0.03	8.78	0.31	0.94	4.17	0.08	1.75	1.14	0.42
Russian Federation	2.43	0.16	0.11	66.95	0.17	1.51	0.06	0.01	0.24	0.35	8.19	0.16	1.63	2.22
Saudi Arabia	0.31	0.00	0.09	0.00	37.44	0.00	0.68	0.17	1.95	0.25	0.01	2.63	0.03	0.22
Serbia	0.03	1.05	0.00	0.07	0.01	39.18	0.00	0.00	0.00	0.00	0.11	0.01	0.14	0.32
Singapore	0.34	0.03	17.46	0.07	0.68	0.00	17.90	0.30	2.64	6.74	0.09	2.14	3.90	0.72
South Africa	0.12	0.01	0.15	0.01	0.22	0.01	0.13	64.82	0.21	0.17	0.01	0.34	0.96	0.57
Taiwan	0.00	0.46	3.93	0.25	0.40	0.26	6.38	0.64	55.64	3.34	0.17	0.67	0.01	0.70
Thailand	0.52	0.08	3.81	0.08	1.40	0.01	3.33	0.72	0.71	42.41	0.13	1.46	2.13	0.48
Ukraine	0.43	0.29	0.01	1.80	0.16	0.88	0.14	0.01	0.02	0.14	51.20	0.35	1.09	0.62
United Arab Emirates	5.65	0.01	0.06	0.07	1.35	0.02	0.19	0.11	0.02	0.16	0.34	24.27	1.78	0.31
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Single export weights	0.32	1.25	0.27	2.48	0.44	0.50	0.30	0.50	0.22	0.17	0.68	0.49	6.46	100.00

Source: OeNB/WIFO.

Table A3

## Comparison of the Weights for Manufactured Goods across Different Calculation Periods

Competing countries	1998 to 2000				2001 to 2003				2004 to 2006				2007 to 2009			
	Austrian exports (single weights)	Austrian exports (double weights)	Austrian imports	Total	Austrian exports (single weights)	Austrian exports (double weights)	Austrian imports	Total	Austrian exports (single weights)	Austrian exports (double weights)	Austrian imports	Total	Austrian exports (single weights <sup>1</sup> )	Austrian exports (double weights)	Austrian imports	Total
	%															
Belgium	1.82	2.77	2.21	2.48	1.72	2.88	1.89	2.38	1.73	2.96	1.71	2.35	1.67	3.04	1.79	2.43
Bulgaria	0.34	0.19	0.11	0.15	0.38	0.20	0.17	0.18	0.52	0.28	0.28	0.28	0.68	0.38	0.29	0.34
Denmark	0.86	0.80	0.64	0.72	0.77	0.76	0.59	0.68	0.74	0.69	0.55	0.63	0.73	0.70	0.48	0.59
Germany	36.82	29.95	43.28	36.86	33.43	27.23	42.28	34.85	31.93	25.25	43.07	33.89	31.65	23.97	42.72	33.00
Estonia	0.05	0.04	0.03	0.03	0.08	0.06	0.03	0.04	0.18	0.09	0.03	0.06	0.11	0.07	0.03	0.05
Finland	0.62	0.91	1.12	1.02	0.59	0.86	1.11	0.99	0.58	0.81	1.06	0.93	0.57	0.79	0.60	0.70
France	4.75	6.61	5.22	5.89	4.69	6.52	4.23	5.36	4.12	5.87	4.17	5.04	4.07	5.59	3.59	4.63
Greece	0.45	0.34	0.15	0.24	0.59	0.41	0.13	0.27	0.52	0.38	0.12	0.25	0.58	0.41	0.10	0.26
United Kingdom	4.71	5.47	3.37	4.38	4.95	5.16	2.67	3.90	4.43	4.51	2.28	3.43	3.57	3.57	2.16	2.89
Ireland	0.32	0.82	0.75	0.78	0.31	0.90	1.27	1.08	0.48	0.80	0.86	0.83	0.26	0.69	0.54	0.62
Italy	6.85	8.74	7.80	8.25	6.93	8.83	7.22	8.02	7.15	8.60	7.07	7.85	6.80	8.23	7.08	7.67
Latvia	0.06	0.03	0.02	0.03	0.10	0.05	0.03	0.04	0.13	0.07	0.02	0.05	0.15	0.07	0.02	0.05
Lithuania	0.08	0.06	0.04	0.05	0.11	0.09	0.04	0.06	0.15	0.12	0.04	0.08	0.14	0.13	0.05	0.09
Luxembourg	0.20	0.18	0.17	0.18	0.19	0.18	0.17	0.17	0.23	0.19	0.23	0.21	0.13	0.16	0.17	0.17
Malta	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.11	0.02	0.01	0.02	0.03	0.02	0.02	0.02
Netherlands	2.45	2.40	2.95	2.68	2.26	2.46	2.78	2.62	1.83	2.52	2.74	2.62	1.78	2.64	2.72	2.68
Poland	1.69	1.61	0.76	1.17	1.80	1.82	0.96	1.39	2.24	2.21	1.12	1.68	2.86	2.61	1.35	2.00
Portugal	0.49	0.58	0.56	0.57	0.50	0.57	0.61	0.59	0.45	0.48	0.49	0.48	0.41	0.46	0.37	0.42
Romania	0.68	0.50	0.42	0.46	1.24	0.69	0.74	0.72	1.79	0.96	0.94	0.95	2.04	1.15	0.72	0.95
Sweden	1.22	1.58	1.49	1.53	1.12	1.44	1.42	1.43	1.10	1.42	1.46	1.44	1.21	1.44	1.44	1.44
Slovakia	1.11	0.78	1.07	0.93	1.45	0.90	1.46	1.18	1.67	1.00	1.46	1.22	1.87	1.13	1.64	1.38
Slovenia	1.68	0.93	1.00	0.97	1.74	0.98	1.19	1.09	1.79	0.89	1.19	1.04	1.90	0.84	1.10	0.96
Spain	3.06	3.15	1.41	2.25	2.87	3.15	1.53	2.33	2.99	3.15	1.57	2.38	2.73	2.99	1.63	2.33
Czech Republic	2.78	2.14	2.13	2.14	3.12	2.39	2.72	2.56	3.22	2.63	3.11	2.86	3.63	2.86	3.31	3.08
Hungary	4.93	2.50	3.02	2.77	4.46	2.22	3.24	2.74	3.62	1.93	2.38	2.15	3.25	1.85	2.21	2.02
Cyprus	0.05	0.02	0.00	0.01	0.09	0.02	0.00	0.01	0.04	0.01	0.01	0.01	0.06	0.01	0.02	0.02
Australia	0.50	0.41	0.03	0.22	0.54	0.44	0.05	0.24	0.67	0.52	0.07	0.30	0.70	0.51	0.06	0.29
Chile	0.05	0.07	0.01	0.04	0.05	0.07	0.01	0.04	0.08	0.11	0.01	0.06	0.10	0.13	0.01	0.07
Iceland	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.04	0.03	0.00	0.02	0.03	0.03	0.01	0.02
Israel	0.23	0.29	0.15	0.22	0.17	0.26	0.12	0.19	0.13	0.23	0.09	0.16	0.18	0.26	0.09	0.18
Japan	1.03	3.14	2.97	3.05	1.02	2.88	2.66	2.77	1.07	2.87	2.52	2.70	0.82	2.57	2.05	2.32
Canada	0.76	0.68	0.55	0.61	0.85	0.78	0.47	0.62	1.00	0.91	0.43	0.68	0.85	0.78	0.45	0.62
Mexico	0.23	0.41	0.14	0.27	0.21	0.44	0.19	0.31	0.24	0.49	0.16	0.33	0.35	0.56	0.19	0.38
New Zealand	0.07	0.05	0.01	0.03	0.08	0.06	0.01	0.04	0.09	0.07	0.02	0.05	0.08	0.07	0.03	0.05
Norway	0.47	0.44	0.15	0.29	0.40	0.40	0.12	0.26	0.42	0.41	0.18	0.30	0.60	0.50	0.19	0.35
Switzerland	6.24	3.68	3.39	3.53	6.04	3.34	3.61	3.47	5.26	2.72	3.69	3.19	5.01	2.55	4.25	3.37
South Korea	0.34	0.96	0.51	0.73	0.41	1.12	0.73	0.92	0.49	1.44	1.02	1.24	0.54	1.68	0.65	1.19
Turkey	0.78	0.94	0.54	0.73	0.73	1.01	0.78	0.89	0.86	1.23	0.88	1.06	0.83	1.35	0.86	1.11
U.S.A.	4.93	7.32	6.86	7.08	5.71	7.67	6.72	7.19	6.28	7.63	5.60	6.65	5.04	6.82	6.11	6.48
Bosnia and Herzegovina	–	–	–	–	0.21	0.10	0.04	0.07	0.24	0.12	0.12	0.12	0.30	0.14	0.19	0.17
Brazil	0.42	0.55	0.13	0.33	0.31	0.46	0.10	0.28	0.30	0.58	0.18	0.39	0.64	0.88	0.18	0.55
China	0.74	1.71	1.66	1.68	1.41	2.99	2.26	2.62	1.42	4.27	3.65	3.97	1.96	6.16	4.99	5.60
Hong Kong	0.57	0.88	0.34	0.60	0.70	0.88	0.34	0.61	0.52	0.83	0.21	0.53	0.41	0.81	0.15	0.50
India	0.17	0.38	0.24	0.30	0.22	0.48	0.27	0.37	0.37	0.67	0.34	0.51	0.59	0.96	0.43	0.71
Iran	0.32	0.30	0.03	0.16	0.37	0.30	0.02	0.16	0.37	0.27	0.02	0.14	0.34	0.25	0.01	0.13
Croatia	0.98	0.51	0.34	0.42	1.26	0.62	0.50	0.56	1.35	0.66	0.65	0.65	1.34	0.63	0.61	0.62
Malaysia	0.13	0.35	0.31	0.33	0.13	0.37	0.62	0.50	0.25	0.43	0.33	0.38	0.28	0.42	0.25	0.34
Russian Federation	0.92	1.03	0.29	0.64	1.45	1.35	0.28	0.81	2.08	1.95	0.27	1.13	2.65	2.22	0.31	1.30
Saudi Arabia	0.27	0.17	0.01	0.09	0.25	0.18	0.01	0.10	0.36	0.26	0.01	0.14	0.47	0.22	0.02	0.12
Serbia	–	–	–	–	–	–	–	–	0.17	0.16	0.05	0.11	0.53	0.32	0.22	0.27
Singapore	0.28	0.54	0.20	0.37	0.29	0.61	0.27	0.44	0.27	0.75	0.17	0.47	0.32	0.72	0.13	0.43
South Africa	0.38	0.41	0.07	0.23	0.47	0.50	0.07	0.28	0.56	0.59	0.10	0.35	0.53	0.57	0.10	0.34
Taiwan	0.37	0.90	0.94	0.92	0.31	0.84	0.82	0.83	0.33	0.78	0.70	0.74	0.23	0.70	0.63	0.66
Thailand	0.20	0.31	0.26	0.28	0.15	0.35	0.28	0.32	0.15	0.39	0.37	0.38	0.18	0.48	0.41	0.45
Ukraine	0.29	0.32	0.12	0.22	0.41	0.43	0.17	0.30	0.55	0.54	0.20	0.37	0.72	0.62	0.21	0.42
United Arab Emirates	0.22	0.10	0.01	0.05	0.32	0.23	0.01	0.12	0.34	0.24	0.03	0.14	0.52	0.31	0.02	0.17
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: OeNB/WIFO.

<sup>1</sup> The single export weight measures for the 2007 to 2009 period given in table A3 do not match the respective figures in table A2 as the figures in table A3 do not include the share of exports to the rest of the world because it is not possible to calculate double weights for the latter.



## Event Wrap-Ups

# A Changing Role for Central Banks?

Key findings from the 41<sup>st</sup> OeNB Economics Conference,  
Vienna, June 10 and 11, 2013

Ernest Gnan,  
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*Central banks worldwide have been playing a vital role in coping with the economic, financial and sovereign debt crisis. The crisis has shifted and has expanded central banks' responsibilities, goals and instruments. Beyond their primary objective of maintaining price stability, central banks are in the process of assuming additional responsibilities in macro- and micro-prudential supervision. While unchanged on paper, monetary policy strategies have been revamped substantially in practice to suit crisis needs. The range of instruments has been widened dramatically; in many cases, unconventional policy tools now predominate or have even nearly completely replaced precrisis modes of monetary policy implementation. While the different goals central banks must now pursue – in particular price stability and macro-prudential stability – are mirrored in theory by a congruent set of instruments, the delineations of goals and of the respective instruments are less clear in practice; experience will result in possible tradeoffs and will bring conflicts to the surface. At an institutional level, the increased range of competences of central banks risk attracting criticism and could ultimately also endanger central banks' hard-won independence. Against this background, the conference sought to discuss what central banks will look like after the crisis. Like previous conferences, the 2013 conference brought together around 350 academics, central bankers, politicians and other interested constituencies to exchange views on these important issues.*

In his *opening remarks*, OeNB Governor *Ewald Nowotny* emphasized that central banks' responsibilities have been transformed to reflect the prevailing historical and economic conditions. Today, central banks alongside parliaments, governments and the judiciary are among the pillars of modern democratic nations. Before World War I, central banks predominantly focused on guarding financial stability and funding government debt. After the Great Depression in the early 1930s up to the era following World War II, the mandate of central banks concentrated on coping with high inflation and mass unemployment. Since then, central banks' foremost aim has been to ensure price stability. Central banks succeeded in achieving their goals quite well by wielding conventional interest rate policy instruments. The financial crisis has entailed additional challenges for central banks. By using conventional as well as unconventional monetary policy

instruments, central banks have reacted fast and forcefully to changed conditions, thus safeguarding financial stability.

An additional challenge for central banks arises from the interconnectedness of fiscal and monetary policy. What we see in practice today is a clear division of institutional responsibility for fiscal policy on the one hand and monetary policy on the other. At the same time, under specific circumstances, coordination between fiscal policy and monetary policy institutions may be necessary. This is also reflected in the legal mandate of the European Central Bank. The mandate of the ECB sets clear priorities without ignoring the larger macroeconomic perspectives. Central banks' increasing involvement in financial sector stability and banking supervision represents an important extension of their role. In the context of the recent crisis, we have observed a tendency for central banks

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to play a stronger role also in microprudential, and especially macroprudential, supervision. Governor Nowotny cited the new supervisory role of the European Central Bank in the context of the project of a European banking union as an example. Banking supervision at the European level is a risky economic governance task requiring reliable and comprehensive preparation.

In his *opening address*, *Andreas Schieder*, State Secretary in the Austrian Federal Ministry of Finance, outlined that GDP growth forecasts for the next two years put Austria in a favorable position compared to other countries such as the Netherlands or France. A balanced growth path is projected for 2016. Still, the economy is suffering from the aftermath of the crisis. Schieder acknowledged the important role of central bank, but also pointed out the limits of a focus on inflation targeting only. He went on to say that the nationalization of some Austrian banks was not only a matter of national interest, but had deeper systemic effects also at the European level. Schieder stressed that a banking union will require coordination and resolution mechanisms. Furthermore, the State Secretary advocated the implementation of a financial transaction tax, which was supported by all Austrian parties.

*Session 1*, entitled “The Mandate of Central Banks,” was chaired by Ewald Nowotny.

The keynote address by *Benôit Coeuré*, Member of the Executive Board of the ECB, focused on the distributional consequences of central bank action. Rising unemployment, lower incomes and reduced household wealth due to decreases in housing prices are a consequence of the financial crisis. Implicitly poorer households were affected disproportionately by the crisis.

Coeuré pointed out that it is not within the central bank’s mandate to address rising inequalities and that any distributional consequences of monetary policy are only temporary in nature. Provided that transmission channels work properly, central banks ensure, by fulfilling the mandate of price stability and contributing to overall economic stability, that distributional effects remain neutral.

But Coeuré observed that the world is fragmenting along three dimensions, which has impaired the potency of monetary policy actions. Each of these dimensions is affected differently by monetary policy: the horizontal dimension, comprising market players with different characteristics; the vertical dimension, comprising investment, consumption and savings decisions over time; and the spatial dimension, comprising different regions and countries. Even though the ultimate objectives of monetary policy are not different during crisis and noncrisis times, the instruments and measures to achieve them may vary. As has been the case for the ECB, during a crisis, the aim of monetary policy should be to repair the transmission channels by reducing such fragmentations and thereby restoring distributional neutrality. Governments alongside central banks need to continue their reforms of the financial sector by stabilizing fiscal imbalances and promoting structural policies.

*Harold James*, Princeton University professor, described the problem of designing an institutional framework in Europe that can deal with financial instabilities. European monetary integration emerged as a response to global currency disorders and current account imbalances. James linked the discussions surrounding the institutional design of the currency union in the 1980s and 1990s to the current debate

on the future evolution of the euro area. He argues that if one regards regulation as the only logical solution to financial instabilities – regulations are designed by national policymakers and as such are implemented within national settings – the consequence will be a fundamental reversal of the historical trend toward integration. In his opinion, the flaw during the introduction of the common currency was that no effective macroprudential supervision mechanism was implemented at the same time. The EU Committee of Central Bank Governors’ draft referred to the possibility that the ECB would be tasked with banking supervision and regulation functions, but by the time this proposal had been included in the Maastricht Treaty provisions on monetary policy, it was accompanied by so many provisos that it looked as if the hurdles to effective European banking supervision could not be set higher. The intrusion of politics had thus resulted in a fundamental flaw in the new European monetary order. James concluded with three recommendations: first, to recognize the need for regionally differentiated monetary policy (e.g. bank collateral requirements); second, to allow for individual transfer systems to guarantee fiscal sustainability at the European level (e.g. the European social security system); third, to increase flexibility regarding sovereign bankruptcy.

*Session 2* on “The Changing Role of Central Banks: A Historical Perspective” was chaired by *Wolfgang Dukatczek*, Vice Governor of the OeNB.

*Forrest Capie*, Cass Business School professor, claimed that central bank independence would not survive the crisis because it is not suitable for all occasions. He illustrates this statement mainly by describing the relationship between the state and the Bank of Eng-

land as one of mutual dependency. During several crises, the government issued rules instructing the bank how to master the respective situation. In the post-World War II period up to 1980, the Bank of England operated under considerable freedom with respect to its principal function of defending the exchange rate. This was complemented by the method of financing the Bank of England through a levy by financial institutions. Capie asserted that during crisis times, ultimately, there could not be an independent central bank because it was impossible to write complete and contingent contracts for central banks. Even the ECB’s behavior is political, as, according to Capie, it switched from controlling inflation by monetary policy to a policy of buying government debt to keep the euro area together at least long enough for further political changes to be implemented in the EU.

*Stefano Ugolini*, assistant professor at the University of Toulouse 1, focused on monetary policymaking from a political economy approach in his contribution. In his view, central banks are the outcome of some form of collective bargaining among different interest groups. Historically, central banks developed along two functional perspectives, namely the microeconomic perspective, e.g. the management of payment systems, and the macroeconomic perspective, e.g. the provision of monetary stability. This interplay determines the complex relationship between monetary and fiscal authorities. The idea that monetary and fiscal authorities can live their lives oblivious of each other is, according to Ugolini, not validated by historical evidence. He therefore advocates a more integrative approach of those two state authorities.

*Session 3* under the header “Central Banking and Macroeconomic Theory”

was chaired by *Martin Summer*, head of division at the OeNB.

*Athanasios Orphanides*, Senior Lecturer at the MIT Sloan School of Management, elaborated on the question of whether full employment was an appropriate monetary policy target. He contrasted the mandate of the Federal Reserve System with its multiple goals with the singular, price stability-focused mandate of the ECB. Citing Paul Volcker, Orphanides claimed that the dual mandate approach was an overburdening and operationally confusing mandate for a central bank. According to Orphanides, the problem lies in the uncertainties involved in constructing real economic targets and in detecting shifts in the natural rates of these real targets. He contended that policymakers could not resolve these issues without acknowledging the dynamics of data revisions. The estimates based on real time data are the ones relevant for policy decisions. Orphanides therefore argued that simple policy rules suggesting good macroeconomic outcomes could be obtained without the need to rely on natural rate estimates. He concluded by stating that full employment was an important public policy objective but not an appropriate monetary policy target.

*Xavier Ragot*, associate professor at the Paris School of Economics, discussed which mandate central banks should pursue after the crisis. The actions of central banks were set to improve transmission channels of monetary policy to restore financial stability. Ragot claimed that the objective should be financial efficiency instead, which is a closer fit to the actual policies pursued by the ECB. He advocated addressing the objective of financial efficiency by financial regulation policies. Furthermore, such an objective was compatible with the notion that mone-

tary policy should not generate redistribution, nor provide too much insurance. Ragot suggested spreads of prices and trading volumes as possible quantifiable measures for the objective of financial efficiency. He advocated reassessing the narrow mandate of the ECB and promoting financial efficiency as a target.

*Session 4* on “The Political Economy of Central Banking in Crisis and Post-Crisis Situations” was chaired by *Peter Mooslechner*, Executive Director at the OeNB.

*Ernst Baltensperger*, University of Bern professor, addressed the issue of “Central Bank Independence in Times of Tranquility and Stress.” Depending on the circumstances, central bank independence is always uncertain and frail: Central bank laws can be reinterpreted, changed or simply ignored. Central bank independence is important nevertheless, as it serves as an obstacle – any change or violation of the principle requires reflection. Central banks’ independence from fiscal decisions is a key element of successful monetary constitutions. In many countries, the debt and banking crises have prompted disregard of this basic insight, and many central banks are now pursuing a dangerous course mixing up monetary and fiscal motives. Monetary dominance in the sense that the central bank uses its instruments solely to pursue its price stability mandate and that the fiscal authority reacts passively, accepting whatever revenue results from the central bank’s action, is the only type of coordination consistent with enduring monetary stability. Whether central banks should be allowed to buy government debt should in theory depend on the underlying motive. In practice, a distinction between fiscal and monetary motives is difficult, and governments’ high debt burdens will

create pressure on central banks to delay exit from these purchases or holdings.

The important lessons from the 1970s and 1980s “Great Inflation” are currently at risk of being forgotten. Two decades of very low inflation have led us to lose sight of the dangers of inflation or have even prompted some observers to call for “some inflation” as a remedy to low growth and high debt burdens. This mood resembles the one of the 1950s and 1960s, and the idea of nominal income targeting is an example of political and intellectual pressure being built up against central banks.

*Laurence Boone*, economist at the Research Division of Bank of America Merrill Lynch, gave a presentation on “One Central Bank, 17 Governments: Avoiding Banking Dominance.” The so far unclear operating framework for the ECB, 17 national supervisors and 17 governments has affected monetary and financial system stability in EMU. The ECB has addressed the risk of fiscal dominance by tying Outright Monetary Transactions (and the preceding Securities Markets Programme) to conditionality. The risk of banking dominance has yet to be resolved. In the current setup, the ECB suffers from information asymmetry. Furthermore, national interests (preserving large national banks regarded as “national champions” and the fear of fiscal and political costs of banking sector restructuring) have delayed necessary reforms and resolutions in the European banking industry in the euro area. European banking union has the potential to redress the situation by correcting for information asymmetries. Furthermore, the ECB’s initial asset quality review will force Member States to proceed with banking sector restructuring and to establish a workable euro area-wide banking resolution frame-

work. To be effective, the asset quality review should be run by the ECB independently of national supervisors. It must be published and must be accompanied by a clear backstop and resolution framework. The crisis has shown that to preserve the ECB’s independence, the central bank has to be responsible both for monetary policy and for financial supervision; however, this needs to be accompanied by full information on banking developments for the ECB, by effective resolution schemes and by a fiscal backstop that allows the central bank to take decisions with complete independence.

The first day of the conference ended with a *Kamingespräch* with *Maria Fekter*, Austrian Federal Minister of Finance. Fekter spoke about public finances and financial stability from an Austrian perspective. The economic recovery is still ongoing; dealing with the aftermath of the crisis has been painful for many countries. Fekter advocated strict fiscal discipline and a common European supervisory mechanism for all European banks, not only those in the euro area. She emphasized the importance of common bankruptcy procedures for banks to determine who should be held liable for a bank’s debt. Fekter called for the creation of a facility to secure deposits of up to EUR 100,000 throughout Europe.

The second day opened with *Session 5* on “Central Banking, Financial Stability and European Banking Union” and was chaired by *Andreas Ittner*, Executive Governor of the OeNB.

*Charles Goodhart*, London School of Economics professor, drew “Lessons for Monetary Policy from the Euro Area Crisis.” He pointed out that the crisis has shown us that price stability is not sufficient to maintain financial stability. Hence, the consensus has emerged that we need countercyclical

macroprudential instruments, which should best be hosted in the central bank. Goodhart asks whether these instruments can work well enough, given incentives among politics to sustain booms, and in the face of regionally strongly differing imbalances and asset price booms and declines. Furthermore, there are important conflicts between micro- and macroprudential considerations: While microprudential regulators also want tighter capital constraints, such restraints can be very detrimental from a macroprudential perspective in a downturn.

Additionally, the risk-weighting approach pursued in Basel II has been shown not to have worked well. But the leverage ratio provided for in Basel III is also far too lax. The crisis has also shown that during crises, funding liquidity through wholesale markets dries up, emphasizing the need for liquidity coverage ratios and net stable funding ratios. When central banks hit the zero lower bound of interest rates, unconventional policies become necessary. The specific crisis in the euro area has also emphasized the need for a banking union. The absence of such a union has been one of the major differences between the U.S. and the euro area crisis experience so far and has promoted “doom loops” between banking and sovereign debt problems in the euro area.

*Dirk Schoenmaker*, dean of the Duisenberg School of Finance in Amsterdam, addressed the issue of “Governance of International Banking.” The crisis has exposed severe coordination failure among national supervisory authorities, given that cross-border externalities of failures of large, internationally operating banks were largely ignored by national supervisors. The “financial trilemma” states that international banking, national financial sta-

bility policies and financial stability are incompatible (much the same as in the “monetary trilemma,” where free capital movements, national monetary policies and exchange rate stability are not compatible). Therefore, international banking is at a crossroads: Either, to preserve international banks, a European banking union with joint supervision and resolution including burden sharing is established, or, if supervision remains a national competence, banking is renationalized with fully independent subsidiaries. These subsidiaries might in the extreme need to have different brand names than the parent institutions to limit spillovers within banking groups.

The national approach comes at substantial costs of inefficiently large necessary local liquidity pools and capital buffers, since they cannot be shared within a group in an emergency. These costs will eventually be passed on in the form of higher lending or lower deposit rates. Given the absence of a European government which could directly collect taxes, the banking union eventually requires burden sharing among governments in the event of bank failures. To facilitate and speed up decision making, voting procedures need to be changed from unanimity to qualified majority voting. In addition to a centralized banking supervision and lender of resort function to be performed by the ECB, a European Deposit Insurance and Resolution Authority as well as an effective fiscal backstop for banks from the ESM are needed.

The conference concluded with *Session 6*, chaired by *Ernest Gnan*, Head of Division at the OeNB, on the topic of “Monetary Policy Crisis Management and Price Stability.”

*Katrin Assenmacher*, deputy director at the Swiss National Bank, gave a presentation on “Monetary Policy since the

Financial Crisis: Why Interest Rates Need to Be Low.” She argued that while central banks worldwide have embarked on highly expansionary conventional and unconventional monetary policy measures, growth remains sluggish and inflation has been slowing. The risks associated with a prolonged period of low interest rates, such as a misallocation of resources, a weakening of fiscal discipline and evergreening of private debt, asset price booms and ensuing financial instability, must be taken seriously. But at the current juncture, stimulating wealth and credit channel effects from higher asset prices as well as investment in riskier assets may buy the time necessary to achieve balance sheet repair. Asset price bubbles pose a risk to financial stability particularly when mostly credit financed, which does not generally seem to be the case now.

The timing of the exit from expansionary monetary policies will be critical. It will also be necessary to get the incentives right to avoid moral hazard. The post-crisis environment for monetary policy will have changed. Central banks should stick to the primary objective of price stability; too many objectives risk overburdening central banks. Regulation should enhance banks’ ability to bear losses. Switzerland performed relatively well throughout the crisis; despite a zero interest rate policy, the Swiss National Bank had to curb the appreciation of the Swiss franc at 1.20 per euro. Strong credit and property price growth prompted the authorities to adopt macroprudential measures in February 2013: Banks will have to hold 1% of additional capital for risk-weighted mortgage loans financing residential property located in Switzerland.

The final paper on “The Short- and Long-Term Effects of Ultra-Easy Mon-

etary Policy” was presented by *William R. White*, Chairman of the Economic Development and Review Committee of the OECD. The crisis has reminded us that economic systems are not machines but highly complex nonlinear systems whose reactions and outcomes are impossible to predict. The current ultra-easy monetary policies are an unprecedented economic experiment; not even during the Great Depression were such policies used. While individual central banks’ measures differ in detail, they share an emphasis on short-run “Keynesian” benefits, ignoring possible long-term costs. Central banks currently face “radical uncertainty.” Their easing cycles since the 1980s have been asymmetrical (more easing than subsequent tightening) and have become more aggressive during each cycle. This “Great Moderation” should rather be understood as a series of booms and busts centered in different markets, and overall aggravating imbalances (artificially low consumer price inflation due to globalization, the collapse of household saving in the U.S.A., housing and other asset price booms, excessive investment in China, a boom of shadow banking, soaring leverage in the face of lax lending standards, exploding current account imbalances) culminating in the current crisis. As a result, policy rates have now hit the zero lower bound, leading to the need for nonconventional easing. Negative medium-term effects include inflation (Wicksell), misallocation of resources (Hayek), malinvestment (Koo), banking sector problems (Minsky), an expansion of shadow banking (Shin).

Ultra-easy monetary policy has so far been quite weak in stimulating aggregate demand, given that uncertainty and long-term perspectives dominate corporate and household spending decisions. Instead, very low rates squeeze

profits of banks and institutional investors, thus tightening credit conditions, boosting some asset prices to unsustainable levels, distorting international capital flows, and leading market dynamics (RORO – risk on-risk off) to dominate economic fundamentals. Ultra-easy monetary policies also impede deleveraging, lead banks to continue lending to unsound firms (which hampers productivity growth in the long run), have substantial effects on distribution, and lead governments to forbear necessary structural, growth-restoring reforms. White called on governments with remaining fiscal scope to use this scope, to encourage private and public investment, to use debt forgiveness and restructuring more aggressively, and to enact more vigorous structural reforms.

The *Klaus Liebscher Award* was created in 2005 on the occasion of the 65<sup>th</sup> birthday of former OeNB Governor Klaus Liebscher in recognition of his services to Austria's participation in the European Economic and Monetary Union and for European integration; it has been awarded annually since then. The Klaus Liebscher Award for 2013 was presented by Claus Raidl and Ewald Nowotny to the authors of two studies of high scientific quality and policy relevance, which were selected from among many high-quality submissions.

In his work on “International Debt Deleveraging,” *Luca Fornaro*, London School of Economics, uses a macroeconomic framework to analyze a monetary union where different countries reduce debt simultaneously. The decline in aggregate demand and interest rates as a consequence of this simultaneous deleveraging cannot be compensated by exchange rate adjustments in the monetary union. He investigates the effects of a systemic recession within such a monetary union and proposes various policy actions that can improve the macroeconomic situation for all countries.

In their joint work “Efficient Fiscal Spending by Supranational Union” *Jenny Simons*, Stockholm Institute of Transition Economics, and *Justin Valasek*, Wissenschaftszentrum Berlin, discuss whether a community of sovereign states with a strong self-interest principle is able to efficiently draw up a joint budget. The authors apply concepts from negotiation theory and show that the bargaining power of the individual states cannot be established from the outset, but rather results in the negotiation process itself. This creates a link between budget contributions and the allocation of these contributions within the community. In this framework, the authors discuss the conditions under which budget preparation and allocation are as efficient as possible.



Notes

# List of Studies

## Published in Monetary Policy & the Economy

For further details on the following publications, see [www.oenb.at](http://www.oenb.at).

### 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 Krsnakova, 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 40<sup>th</sup> Economics Conference of the Oesterreichische Nationalbank  
*Ernest Gnan, Esther Segalla*

### **Issue Q3/12**

Sovereign Debt Crisis Delays Economic Recovery

*Gerhard Fenz, Isabella Moder, Maria Silgoner*

Eurosystem Household Finance and Consumption Survey 2010

First Results for Austria

*Pirmin Fessler, Peter Mooslechner, Martin Schürz*

### **Issue Q4/12**

Austria Prevails in Bleak Environment

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

*Gerhard Fenz, Martin Schneider*

The Cross-Border Movement of Euro Banknotes  
and Austria's TARGET2 Liabilities

*Clemens Jobst, Martin Handig, Doris Schneeberger*

The Use of Payment Instruments in Austria

A Study Based on Survey Data from 1996 to 2011

*Peter Mooslechner, Helmut Stix, Karin Wagner*

Housing Cost Burden of Austrian Households: Results of a Recent Survey

*Christian Beer, Karin Wagner*

Financial Markets and Real Economic Activity

*Burkhard Raunig*

### **Issue Q1/13**

Austria Withstands Recession: Return to Positive Growth in Early 2013

*Klaus Vondra*

Structural Budget Balances: Calculation, Problems and Benefits

*Lukas Reiss*

Effective Retirement Age in Austria – A Review of Changes since 2000

*Alfred Stiglbauer*

The Future of Sovereign Borrowing

Key Findings of a Conference Jointly Organized by SUERF,

OeNB and BWG on March 8, 2013, in Vienna

*Ernest Gnan, Johannes Holler*

# Periodical Publications

See [www.oenb.at](http://www.oenb.at) for further details.

## **Geschäftsbericht (Nachhaltigkeitsbericht) Annual Report (Sustainability Report)**

German | annually  
English | annually

This report informs readers about the Eurosystem's monetary policy and underlying economic conditions as well as about the OeNB's role in maintaining price stability and financial stability. It also provides a brief account of the key activities of the OeNB's core business areas. The OeNB's financial statements are an integral part of the report.

[www.oenb.at/de/presse\\_pub/period\\_pub/unternehmen/geschaeftsbericht/geschaeftsberichte.jsp](http://www.oenb.at/de/presse_pub/period_pub/unternehmen/geschaeftsbericht/geschaeftsberichte.jsp)

[www.oenb.at/en/presse\\_pub/period\\_pub/unternehmen/geschaeftsbericht/geschaeftsbericht.jsp](http://www.oenb.at/en/presse_pub/period_pub/unternehmen/geschaeftsbericht/geschaeftsbericht.jsp)

## **Konjunktur aktuell**

German | seven times a year

This online publication provides a concise assessment of current cyclical and financial developments in the global economy, the euro area, Central, Eastern and Southeastern European countries, and in Austria. The quarterly releases (March, June, September and December) also include short analyses of economic and monetary policy issues.

[www.oenb.at/de/geldp\\_volksw/konjunktur/konjunktur\\_aktuell.jsp](http://www.oenb.at/de/geldp_volksw/konjunktur/konjunktur_aktuell.jsp)

## **Monetary Policy & the Economy**

English | quarterly

This publication assesses cyclical developments in Austria and presents the OeNB's regular macroeconomic forecasts for the Austrian economy. It contains economic analyses and studies with a particular relevance for central banking and summarizes findings from macroeconomic workshops and conferences organized by the OeNB.

[www.oenb.at/en/presse\\_pub/period\\_pub/volkswirtschaft/geldpolitik/monetary\\_policy\\_and\\_the\\_economy.jsp](http://www.oenb.at/en/presse_pub/period_pub/volkswirtschaft/geldpolitik/monetary_policy_and_the_economy.jsp)

## **Fakten zu Österreich und seinen Banken Facts on Austria and Its Banks**

German | twice a year  
English | twice a year

This online publication provides a snapshot of the Austrian economy based on a range of structural data and indicators for the real economy and the banking sector. Comparative international measures enable readers to put the information into perspective.

[www.oenb.at/de/presse\\_pub/period\\_pub/statistik/fakten/fakten\\_zu\\_oesterreich\\_und\\_seinen\\_banken.jsp](http://www.oenb.at/de/presse_pub/period_pub/statistik/fakten/fakten_zu_oesterreich_und_seinen_banken.jsp)

[www.oenb.at/en/presse\\_pub/period\\_pub/statistik/fakten/facts\\_on\\_austria\\_and\\_its\\_banks.jsp](http://www.oenb.at/en/presse_pub/period_pub/statistik/fakten/facts_on_austria_and_its_banks.jsp)

## **Financial Stability Report**

English | twice a year

The Reports section of this publication analyzes and assesses the stability of the Austrian financial system as well as developments that are relevant for financial stability in Austria and at the international level. The Special Topics section provides analyses and studies on specific financial stability-related issues.

[www.oenb.at/en/presse\\_pub/period\\_pub/finanzmarkt/finanzmarktstabilita/financial\\_stability\\_report.jsp](http://www.oenb.at/en/presse_pub/period_pub/finanzmarkt/finanzmarktstabilita/financial_stability_report.jsp)

## **Focus on European Economic Integration**

English | quarterly

This publication presents economic analyses and outlooks as well as analytical studies on macroeconomic and macrofinancial issues with a regional focus on Central, Eastern and Southeastern Europe.

[www.oenb.at/en/presse\\_pub/period\\_pub/volkswirtschaft/integration/focus\\_on\\_european\\_economic\\_integration.jsp](http://www.oenb.at/en/presse_pub/period_pub/volkswirtschaft/integration/focus_on_european_economic_integration.jsp)

## **Statistiken – Daten & Analysen**

German | quarterly

This publication contains analyses of the balance sheets of Austrian financial institutions, flow-of-funds statistics as well as external statistics (English summaries are provided). A set of 14 tables (also available on the OeNB's website) provides information about key financial and macroeconomic indicators. In addition, special issues on selected statistics topics are published at irregular intervals.

[www.oenb.at/de/presse\\_pub/period\\_pub/statistik/statistiken/statistiken\\_-\\_daten\\_und\\_analysen.jsp](http://www.oenb.at/de/presse_pub/period_pub/statistik/statistiken/statistiken_-_daten_und_analysen.jsp)

## Research Update

English | quarterly

This online newsletter informs international readers about selected research findings and activities of the OeNB's Economic and Analysis and Research Department. It offers information about current publications, research priorities, events, conferences, lectures and workshops. Subscribe to the newsletter at:

[www.oenb.at/en/presse\\_pub/period\\_pub/volkswirtschaft/newsletter/einleitung.jsp#tcm:16-171525](http://www.oenb.at/en/presse_pub/period_pub/volkswirtschaft/newsletter/einleitung.jsp#tcm:16-171525)

## CESEE Research Update

English | quarterly

This online newsletter informs readers about research priorities, publications as well as past and upcoming events with a regional focus on Central, Eastern and Southeastern Europe. Subscribe to the newsletter at:

[www.oenb.at/en/geldp\\_volksw/zentral\\_osteuropa/News/newsletter/cesee\\_newsletter.jsp](http://www.oenb.at/en/geldp_volksw/zentral_osteuropa/News/newsletter/cesee_newsletter.jsp)

## OeNB Workshop Proceedings

German, English | irregularly

This series, launched in 2004, documents contributions to OeNB workshops with Austrian and international experts (policymakers, industry experts, academics and media representatives) on monetary and economic policymaking-related topics.

[www.oenb.at/en/presse\\_pub/period\\_pub/volkswirtschaft/workshops/workshops.jsp#tcm:14-172875](http://www.oenb.at/en/presse_pub/period_pub/volkswirtschaft/workshops/workshops.jsp#tcm:14-172875)

## Working Papers

English | irregularly

This online series provides a platform for discussing and disseminating economic papers and research findings. All contributions are subject to international peer review.

[www.oenb.at/en/presse\\_pub/research/020\\_workingpapers/\\_2013/working\\_papers\\_2013.jsp#tcm:16-256010](http://www.oenb.at/en/presse_pub/research/020_workingpapers/_2013/working_papers_2013.jsp#tcm:16-256010)

## Proceedings of the Economics Conference

English | annually

The OeNB's annual Economics Conference provides an international platform where central bankers, economic policymakers, financial market agents as well as scholars and academics exchange views and information on monetary, economic and financial policy issues. The proceedings serve to document the conference contributions.

[www.oenb.at/en/presse\\_pub/period\\_pub/volkswirtschaft/vowitagung/economics\\_conferences.jsp](http://www.oenb.at/en/presse_pub/period_pub/volkswirtschaft/vowitagung/economics_conferences.jsp)

## Proceedings of the Conference on European Economic Integration

English | annually

The OeNB's annual CEEI conference deals with current issues with a particular relevance for central banking in the context of convergence in Central, Eastern and Southeastern Europe as well as the EU enlargement and integration process.

[http://www.oenb.at/en/geldp\\_volksw/zentral\\_osteuropa/Events/archive\\_programs\\_ceei.jsp](http://www.oenb.at/en/geldp_volksw/zentral_osteuropa/Events/archive_programs_ceei.jsp)

The proceedings have been published with Edward Elgar Publishers, Cheltenham/UK, Northampton/MA, since the 2001 conference.

[www.e-elgar.com](http://www.e-elgar.com)

## Publications on Banking Supervisory Issues

German, English | irregularly

Current publications are available for download; paper copies may be ordered free of charge.

[www.oenb.at/en/presse\\_pub/period\\_pub/finanzmarkt/barev/barev.jsp](http://www.oenb.at/en/presse_pub/period_pub/finanzmarkt/barev/barev.jsp)

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