

# MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

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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 pursue a regional focus on Central, Eastern and Southeastern Europe.

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

to the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between three and six 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 2016 should be e-mailed to

*eva.gehringer-wasserbauer@oenb.at*  
by November 1, 2015.

Applicants will be notified of the jury's decision by mid-December. The following round of applications will close on May 1, 2016.

# Analyses

# Four-year economic downturn to end in 2016

Economic outlook for Austria from 2015 to 2017 (June 2015)

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

## 1 Summary

According to its June 2015 economic outlook, the Oesterreichische Nationalbank (OeNB) expects – as in December 2014 – the Austrian economy to grow by 0.7% in 2015. For 2016 and 2017, it anticipates growth to accelerate to +1.9% and +1.8%, respectively.

At a mere +0.4%, Austrian GDP growth was disappointing in 2014, being not only lower than in the euro area (+0.9%), but also considerably lower than in Germany (+1.6%). The economic downturn was induced by sluggish export demand and uncertainties about future economic developments, which were caused by geopolitical tensions – in particular, the conflict between Russia and Ukraine – and dampened companies' propensity to invest. Furthermore, comparatively high inflation meant very weak growth in real income and, thus, private consumption.

Growth in the *world economy* will remain well below pre-crisis levels in 2015 – six years after the Great Recession. In emerging Asian and Latin American market economies, GDP growth has slowed noticeably, and Russia is mired in recession. As a result, industrialized nations are fueling global GDP growth – unlike in previous years.

In early 2015, monetary policy in almost every part of the world had an extraordinarily expansionary effect, but individual regions were in different phases of their respective monetary policy cycles. While the U.S.A. ended its large-scale asset purchases in October 2014 after three years of vibrant GDP growth, in January 2015, the

Governing Council of the European Central Bank (ECB) approved a broad-based program to purchase government bonds in order to combat deflationary risks. In Japan, monetary policy makers are also pursuing an expansionary strategy with the purchase of domestic government bonds. The different stages of monetary policy measures are triggering high levels of volatility on global currency markets, stock markets and bond markets.

The recession particularly in the *euro area* had a dampening impact on the global economy in 2012 and 2013. Nevertheless, GDP growth in the euro area stabilized in 2014 and will accelerate in the next few years. The euro area has been benefiting from several factors fueling growth since the end of 2014. The price of crude oil, which fell sharply during 2014, is having a positive impact on both companies and consumers. The Eurosystem's expanded asset purchase programme (APP) further reduced financing costs and should prompt a rise in inflation expectations and a weakening in real interest rates. The announcement of the APP resulted in the softening of the euro, which was accompanied by an improvement in short-term price competitiveness. In view of well-advanced consolidation, fiscal policy will no longer have a dampening effect on GDP growth. Growth in the euro area has so far been very uneven, however. Whereas GDP growth in early 2015 reached pre-2008 crisis levels in the former EU-IMF program countries of Ireland and Spain, other countries such as Italy and Finland are still struggling with structural prob-

Cutoff date:  
May 20, 2015

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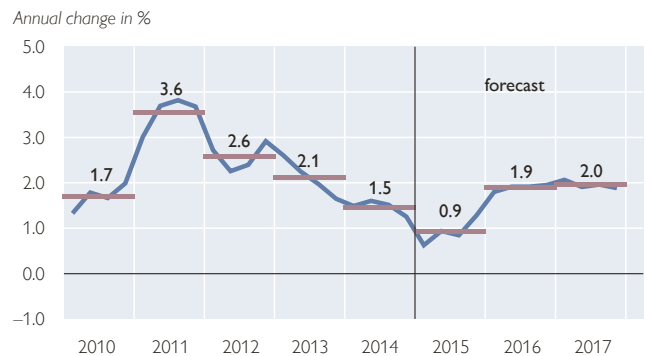
Chart 1

## OeNB June 2015 outlook for Austria – key results

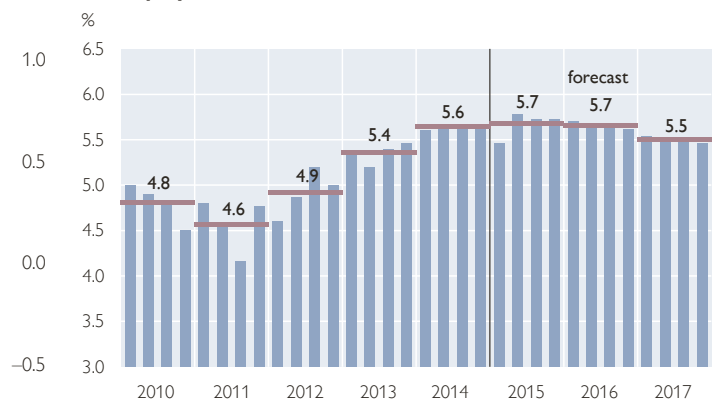
### Real GDP growth (seasonally and working day-adjusted)



### Harmonised Index of Consumer Prices



### Unemployment rate



Source: Statistics Austria, WIFO, OeNB June 2015 outlook.

lems hampering more buoyant growth. In addition, uncertainty about future developments in Greece has further increased significantly since the end of 2014.

Austrian exporters have registered deteriorating price competitiveness in recent years, suffering noticeable losses in market shares for domestic exports. For instance, Austrian exporters in the German market have been crowded out by exporters from other countries (Slovakia, the Czech Republic, Poland and Hungary) in key segments such as motor vehicle parts and accessories. Further losses in market shares are expected in the years to come. Nevertheless, increasing export momentum will accelerate export growth from +2.8% in 2015 to +4.8% each in both 2016

and 2017 when the Austrian economy will above all be driven by domestic demand. Domestic import growth is also picking up significant pace on the back of strengthening domestic demand. This is why net exports will make only a minimal contribution to GDP growth in 2016 and 2017.

The reasons for the current *downturn in investment* are twofold: low aggregate demand and a pronounced uncertainty about future profitability. Although investment will contract in 2015 as a whole (–1.9% year on year), for the second half of 2015, a drop in uncertainty levels and a slow recovery in investment activity are expected. Investment activity will be fueled primarily by investment in equipment.

*Private consumption* will be determined by growth in real disposable household income. The key stimulus for growth in real disposable household income will come from lower inflation in 2015 and from the tax reform package in 2016. The latter will provide significant relief for households from 2016, boosting disposable household income growth by 1.6 percentage points in 2016 and by 0.4 percentage points in 2017. At +1.8% (2015), +2.8% (2016) and +1.6% (2017), growth in real disposable household income will consequently be considerably higher than in previous years. For private consumption, this means a significant acceleration after several years of only modest growth.

HICP inflation eased to +1.5% in 2014 (2013: +2.1%) and has so far continued to decline sharply in the course of 2015. This drop in inflation was attributable to sharply falling energy prices and the collapse in oil prices. However, Austria has recorded higher inflation rates than the euro area as a whole for a number of years now. In 2015 as a whole, HICP inflation will be historically very low, rising by just 0.9%. The pickup in economic activity and the dissipation of the dampening effects of energy prices will see inflation climb back to +1.9% (2016) and +2.0% (2017).

Employment growth, despite the frail economy, will slow only slightly to +0.7% in 2015 (2014: +0.8%). For both 2016 and 2017, employment growth is expected to accelerate markedly for cyclical reasons. Labor supply

will further expand over the forecast horizon as a whole since the labor force participation rate of older workers will continue to increase and the influx of foreign labor will remain high. In view of weak economic momentum and sustained growth in the labor supply, the unemployment rate (Eurostat definition) will further climb to 5.7% in 2015. As in the past, unemployment will follow GDP growth with a lag and is expected to drop slightly to 5.5% only in 2017.

The general government budget balance will improve significantly to -1.8% of GDP in 2015 (2014: -2.4% of GDP). This improvement is attributable particularly to a decline in capital transfers to banks, which more than offsets the impact of weak economic activity. Compared with 2015, the budget deficit will remain almost unchanged in 2016, as a further decrease in capital transfers to banks and the implications of improved economic activity will be offset to some extent by the impact of the tax reform package. In light of continued healthy GDP growth, a further improvement in the budget balance is expected for 2017. The government debt ratio will register a trend reversal in 2016 and decrease to some 81½% of GDP by 2017. In view of the applicable ESCB guidelines, some of the planned counterfinancing measures (primarily those against tax evasion) are not included in the OeNB's June 2015 economic outlook, which means the budget deficit leans toward being overestimated here.



Table 1

## OeNB June 2015 outlook for Austria – key results<sup>1</sup>

	2014	2015	2016	2017
<b>Economic activity</b>				
<i>Annual change in % (real)</i>				
Gross domestic product (GDP)	+0.4	+0.7	+1.9	+1.8
Private consumption	+0.2	+0.7	+1.8	+1.6
Government consumption	+1.0	+0.9	+0.9	+1.1
Gross fixed capital formation	-0.1	-1.9	+1.7	+2.6
Exports of goods and services	+1.8	+2.8	+4.8	+4.8
Imports of goods and services	+2.2	+2.0	+4.7	+5.1
<i>% of nominal GDP</i>				
Current account balance	+0.8	+1.3	+2.1	+2.8
<b>Contribution to real GDP growth</b>				
<i>Percentage points</i>				
Private consumption	+0.1	+0.4	+1.0	+0.8
Government consumption	+0.2	+0.2	+0.2	+0.2
Gross fixed capital formation	+0.0	-0.4	+0.4	+0.5
Domestic demand (excluding changes in inventories)	+0.3	+0.1	+1.5	+1.6
Net exports	-0.1	+0.5	+0.2	+0.1
Changes in inventories (including statistical discrepancy)	+0.3	+0.0	+0.1	+0.1
<b>Prices</b>				
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+1.5	+0.9	+1.9	+2.0
Private consumption expenditure (PCE) deflator	+1.7	+1.0	+1.8	+1.9
GDP deflator	+1.7	+1.3	+1.8	+1.9
Unit labor costs in the total economy	+2.2	+1.9	+1.2	+1.5
Compensation per employee (at current prices)	+1.8	+1.9	+2.0	+2.3
Compensation per hour worked (at current prices)	+1.9	+2.0	+2.1	+2.4
Import prices	-0.5	+0.4	+1.8	+1.9
Export prices	+0.5	+1.2	+1.9	+1.9
Terms of trade	+1.0	+0.7	+0.0	+0.0
<b>Income and savings</b>				
<i>% of nominal disposable household income</i>				
Real disposable household income	+0.4	+1.8	+2.8	+1.6
<i>% of nominal disposable household income</i>				
Saving ratio	7.5	7.9	8.6	8.6
<b>Labor market</b>				
<i>Annual change in %</i>				
Payroll employment	+0.8	+0.8	+1.1	+1.0
Hours worked (payroll employees)	+0.7	+0.7	+1.0	+0.9
<i>% of labor supply</i>				
Unemployment rate (Eurostat definition)	5.6	5.7	5.7	5.5
<b>Public finances</b>				
<i>% of nominal GDP</i>				
Budget balance	-2.4	-1.8	-1.8	-1.4
Government debt	84.5	85.7	83.8	81.6

Source: 2014: Eurostat, Statistics Austria; 2015 to 2017: OeNB June 2015 outlook.

<sup>1</sup> The outlook was drawn up on the basis of seasonally and working day-adjusted national accounts data (trend-cycle component). The data differ, in the method of seasonal adjustment, from the quarterly data series published by Eurostat in fall 2014 following the switch to the ESA 2010. The data published by Eurostat are much more volatile and can in part not be interpreted from an economic perspective. The values for 2014 also deviate from the nonadjusted data released by Statistics Austria. The figures on real GDP are based on a flash estimate of the national accounts for the first quarter of 2015, while the expenditure-side GDP components are partly based on the full set of national accounts data released for the fourth quarter of 2014.

## 2 Technical assumptions

This forecast is the OeNB's contribution to the Eurosystem's June 2015 staff projections. The forecast horizon ranges from the first quarter of 2015 to the fourth quarter of 2017. May 13, 2015, was the cutoff date for the assumptions on global growth as well as interest rates, exchange rates and crude oil prices. The OeNB used its macro-economic quarterly model to prepare the projections for Austria, which are based on national accounts data adjusted for seasonal and working-day effects (trend-cycle component; prepared by the Austrian Institute of Economic Research – WIFO). The data used for this forecast differ in their method of seasonal adjustment from the quarterly series published by Eurostat since the changeover to the European System of Accounts (ESA 2010) in fall 2014. The data published by Eurostat are far more volatile and, in part, cannot be clearly mapped to specific economic fundamentals. Values for 2014 also differ from the nonseasonally adjusted data published by Statistics Austria. The national accounts data were fully available up to the fourth quarter of 2014. The data for the first quarter of 2015 are based on the GDP flash estimate, which covers 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 0.01% in 2015, 0.05% in 2016 and 0.21% in 2017. Long-term interest rates, which are based on market expectations for ten-year government bonds, are set at 0.8% (2015), 1.1% (2016) and 1.3% (2017). The exchange rate of the euro relative to the U.S. dollar is assumed to stay constant at USD 1.12. The projected development of crude oil prices is based on futures prices. The crude oil price assumed for

2015 is USD 63.8 per barrel of Brent, while the prices for 2016 and 2017 are set at USD 71.0 and USD 73.1, respectively. The prices of commodities excluding energy are also based on futures prices over the forecast horizon.

## 3 Economic recovery in the euro area forges ahead

Growth in the *world economy* will not accelerate in 2015, i.e. six years after the Great Recession. In 2012 and 2013, the recession particularly in the euro area had a dampening impact on the global economy. At +0.9%, growth in the euro area stabilized again in 2014, however. By contrast, the GDP growth of emerging Asian and Latin American market economies slowed, as did that of Russia. GDP growth will persist just below +3.5% in 2015, as key stimuli are neither visible nor anticipated.

*Monetary policy* in almost every part of the world had an extraordinarily expansionary effect in early 2015, but individual regions were in different phases of their respective monetary policy cycles. While the U.K., Canada and the U.S.A. have already ended their asset purchase programs after three years of vibrant GDP growth, in the wake of low inflation the Eurosystem approved a broad-based expanded asset purchase programme (APP) in January 2015 (box 1). Japan's economic policy is alternating between expansionary and contractionary fiscal measures while pursuing a very expansionary monetary policy at the same time. Currently sharp fluctuations on the global currency markets, stock markets and bond markets are a direct consequence of these monetary policy measures. Coupled with a marked oil price shock, the global economy found itself in a state of heightened uncertainty in early 2015.

Unlike in previous years, global GDP growth is currently being fueled by industrialized nations. The *U.S.A.* is experiencing solid growth momentum – apart from the first quarter of 2015, which remained weak owing to temporary factors. Private consumption and gross capital formation are the cornerstones of U.S. GDP growth. At the same time, the *U.S.A.* has seen a one-year period of appreciation of the U.S. dollar against the euro (March 2014: USD/EUR 1.38; April 2015: USD/EUR 1.08), causing American exporters' competitiveness to deteriorate. The steep slump in the price of oil is generating severe losses primarily for shale oil producers in the *U.S.A.* – and in Canada – and is thus inducing a market correction. Overall, positive signals continue to prevail, however. As a result, the Federal Reserve System ended its large-scale asset purchase program in October 2014; anticipated sound GDP growth and labor market improvements should trigger a reversal in interest rates in the course of 2015.

In *Japan*, large-scale fiscal and monetary policy measures were undertaken in the previous two years in a bid to boost the economy and rekindle inflation over the long term. At least, the turn of the year 2014/15 saw the economy register two quarters of positive growth in succession. However, growth in early 2015 was primarily attributable to inventory buildup, and there is a risk that a countermovement will occur in the event that inventories are drawn down in the second quarter of 2015. In addition to persistent structural problems, the Japanese economy is currently also affected by slowing growth in China and emerging Asian market economies. In particular, China has for some time now been witnessing the emergence of a downturn in growth and a „soft landing“ of the economy. Its

growth outlook was downgraded to less than 7% for the forecast horizon as a whole – its weakest growth outlook in the last 15 years. Growth in other Asian countries is subject to country-specific factors, and its profile is increasingly uneven. For instance, *India* recently registered higher GDP growth than the Chinese economy, making *India* currently Asia's fastest growing economy. Overall, this region's growth exceeds 6%. By contrast, the recession in Brazil and the stagnation in Argentina are tempering growth on the entire *Latin American continent*.

*Russia* is another major economy that registered very high levels of growth prior to the Great Recession. The Russian economy is currently in deep recession for a number of reasons: the collapse in the price of oil; the conflict with Ukraine; the resulting economic sanctions by Western industrialized nations; and long-existing structural problems (Dutch disease). Capital outflows, high inflation resulting from the devaluation of the Russian ruble at the end of 2014 and major uncertainties are dampening both investment and consumption. Positive growth is not expected to return before 2017. The economic crisis in Russia is also curbing growth in Eastern European countries whose external trade is closely integrated with that of Russia. At the same time, *Central, Eastern and South-eastern European (CESEE) countries* are benefiting from economic expansion in the euro area. Aggregating the quite uneven development of these countries together, the overall growth of this region is just below 3%, which is more robust than that of the euro area. Compared with the pre-crisis period, however, the growth differential has narrowed significantly.

The *euro area* has been benefiting from several factors driving significant

growth since the end of 2014. First, the sharp fall in the price of oil in 2014 is having a positive impact on both companies and consumers and, second, the monetary policy measures of the Eurosystem (box 1) are lowering the level of interest rates. In markets where direct interventions are made, securities prices are climbing and yields are falling in turn. Lower yields are prompting investors to shift to other market segments, which should pass on the yield effects to broad segments of the financial market and reduce the financing costs for companies, governments and banks accordingly. In addition, the expanded asset purchase programme countered the de-anchoring of inflation expectations. The aforementioned effects when combined are having a dampening impact on the level of real interest rates. If passed on by banks to their borrowers, lower real interest rates

should generate both higher consumption growth and higher investment growth, thereby boosting the economy. Third, the announcement of the APP triggered the devaluation of the euro against most major currencies, as a result of which the short-term price competitiveness of European exporters is improving. Fourth, consolidation in the euro area is so well advanced that no further comprehensive cost-cutting efforts are envisaged during the forecast horizon. Fiscal policy will therefore no longer have a dampening effect on GDP growth. Fifth, following the necessary preparatory work for creating the banking union (comprehensive assessment) and the actual launch of the banking union in 2014 – the supervision of the most important and largest banks of the euro area is now in the ECB's hands –, confidence in the financial markets should have increased.

Box 1

#### **The new asset purchase program of the Eurosystem<sup>1</sup>**

*Despite several years of expansionary monetary policy, HICP inflation in the euro area has been in a clear downtrend since 2011, which was amplified in 2014. Although the euro area was in recession in 2012 and 2013, the euro appreciated significantly in value against the currencies of key trading partners between mid-2012 and early 2014. This phenomenon dampened the prices of imported goods. In addition, the drop in inflation was closely linked to the global development in energy and food prices. Whereas inflation stood just below 1% in early 2014, it further eased to -0.2% by the end of 2014 and dropped to -0.6% in January 2015. The decline was much sharper than predicted. In addition, inflation expectations also abated appreciably. Falling inflation expectations are driving the level of real interest rates up and are exerting a contractionary effect at a time when the monetary policy stance is intended to be expansionary.*

*In response to the falling inflation expectations and to medium-term inflation forecasts that were well below the price stability target of below, but close to, 2%, the Governing Council of the ECB approved an expanded asset purchase programme (APP) on January 22, 2015, whereby financial assets totaling EUR 60 billion are purchased on a monthly basis. Although government bonds of euro area countries are the main focus of the APP, purchases also comprise covered bonds and asset-backed securities of banks in the euro area as well as bonds of both European entities classified as agencies and European institutions. The purchases will be made at least until September 2016 and, at all events, until a sustained correction in the inflation trend toward +2% materializes.*

*Under the APP, the OeNB purchases a portion of the overall asset portfolio in accordance with its capital key share, acquiring both covered bonds and Austrian government bonds with a residual maturity of between two and 30 years.*

<sup>1</sup> Prepared by Claudia Kwapil, Economic Analysis Division, [claudia.kwapil@oenb.at](mailto:claudia.kwapil@oenb.at).

Table 2

## Underlying global economic conditions

	2014	2015	2016	2017
	<i>Annual change in % (real)</i>			
<b>Gross domestic product</b>				
World excluding the euro area	+3.7	+3.4	+4.1	+4.1
U.S.A.	+2.4	+2.6	+3.1	+2.7
Japan	-0.1	+0.5	+1.5	+0.7
Asia excluding Japan	+6.5	+6.2	+6.6	+6.3
Latin America	+1.2	+0.7	+2.1	+2.7
United Kingdom	+2.8	+2.3	+2.5	+2.5
CESEE EU Member States <sup>1</sup>	+2.8	+2.9	+2.8	+2.9
Switzerland	+2.0	+1.0	+1.4	+1.9
Euro area	+0.9	+1.5	+1.9	+2.0
<b>World trade (imports of goods and services)</b>				
World	+2.9	+2.6	+5.0	+5.3
World excluding the euro area	+2.7	+2.0	+4.8	+5.2
Growth of euro area export markets (real)	+2.9	+2.2	+4.6	+5.0
Growth of Austrian export markets (real)	+3.4	+3.8	+5.3	+5.5
<b>Prices</b>				
Oil price in USD/barrel (Brent)	98.9	63.8	71.0	73.1
Three-month interest rate in %	0.2	0.0	0.0	0.2
Long-term interest rate in %	1.5	0.8	1.1	1.3
USD/EUR exchange rate	1.33	1.12	1.12	1.12
Nominal effective exchange rate (euro area index)	102.29	92.57	92.38	92.38

Source: Eurosystem (June 2015 staff macroeconomic projections for the euro area).

<sup>1</sup> Bulgaria, Croatia, Czech Republic, Hungary, Lithuania (until 2014), Poland and Romania.

The euro area will register growth of +1.5% in 2015. The fact that real GDP growth is not currently manifesting relatively stronger momentum despite all the expansionary effects is a consequence of still very uneven growth in the euro area countries. Whereas GDP growth in early 2015 was back at pre-crisis levels in the former EU-IMF program countries of Ireland and Spain, other countries such as Italy and Finland are still struggling with structural problems hampering more buoyant growth. In addition, uncertainty about future developments in Greece has further heightened considerably since the end of 2014. Another factor dampening GDP growth remains the Russia-Ukraine conflict and the related economic sanctions.

Growth in the euro area is currently accelerating on the back of increasingly robust domestic demand.

On a quarterly basis, growth has been in positive territory since the second quarter of 2013, accelerating in the previous four quarters from +0.1% in the second quarter of 2014 to most recently +0.4% in the first quarter of 2015. Growth is being driven primarily by private consumption and – with the exception of the second quarter of 2014 – by gross fixed capital formation. Net exports are not making any significant contributions to GDP growth. A regional analysis of GDP growth in the euro area shows primarily the dynamic growth of Spain, Slovakia and Ireland outstripping the other euro area countries. Although GDP growth in Germany was subject to major fluctuations, it advanced considerably at the turn of 2014/15. In addition, France and Italy registered very positive GDP growth in the first quarter of 2015. By contrast, the Finnish economy is making a very

sluggish recovery. Greece slid back into recession, given the uncertainties about future developments. Its growth outlook for 2015 was significantly downgraded recently.

According to its current June 2015 projections, the Eurosystem expects growth to accelerate to +1.5% (2015), +1.9% (2016) and +2.0% (2017) for the euro area as a whole. This increase, the rising price of oil and the narrowing output gap will trigger a sharp uptick in HICP inflation to +1.5% in 2016 (2015: +0.3%). HICP inflation should be back just under the 2 percent mark as early as 2017, thereby meeting the price stability target. With modest labor supply growth, employment will climb steeply by about +1% year on year, reducing the unemployment rate (Eurostat definition) from some 11½% in 2014 to 10% in 2017. The fiscal balance will improve from -2.4% in 2014 to -1.5% in 2017, which will result in a decrease in total government debt to less than 90% of GDP at the end of the forecast horizon.

#### **4 Austria: economy will recover only in 2016**

##### **4.1 Although export growth is accelerating, Austria is increasingly losing market shares**

Austrian export growth has been extremely subdued since 2012. The lines in chart 2 (left panel) indicate growth in *Austrian export markets*<sup>2</sup>, actual *export growth* and the resulting *market share development*. External demand for Austrian products has been exceedingly sluggish since 2012. Actual export growth was lower still, and Austrian exporters lost market shares (yellow line; market shares as an index with

2007 as the base year). The columns in the left-hand panel also indicate from which group of countries demand for Austrian products is originating. The strongest demand for Austrian exports comes from Germany, western euro area countries and CESEE countries. Both external demand for Austrian products (primarily from Germany) and Austrian export growth should resume steady acceleration until 2017. The right-hand panel in chart 2 shows the revisions of export demand since the OeNB's December outlook for 2015, broken down by individual groups of countries. The previous six months saw an improvement particularly in the outlook for Europe, especially for the euro area (and of relevance for Austria: above all, for Germany), while the Russia-Ukraine conflict was curbing the GDP growth of CESEE countries, and both Asia and America experienced a certain slowdown in economic momentum and thus also in import growth. In addition to export market growth, the left-hand panel also shows the export growth outlook, which will lag behind export market growth, which means Austrian exports will continue to lose market shares in the future.

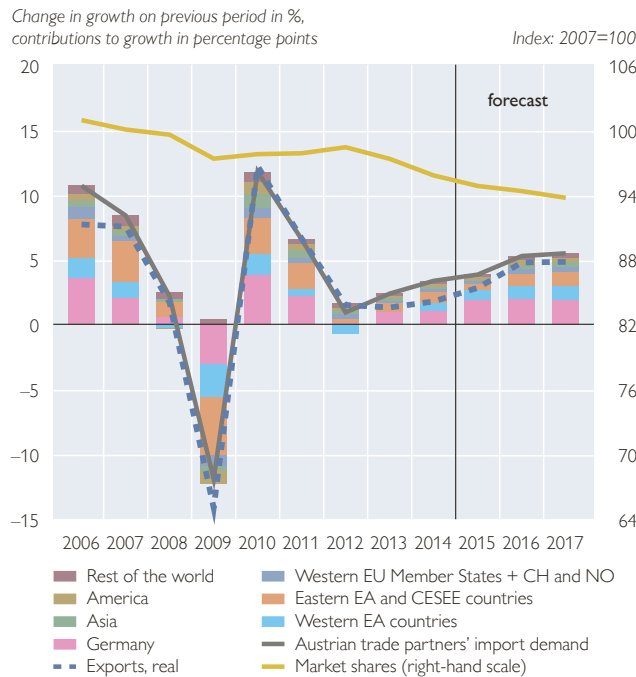
Whereas service exports driven by tourism and by exports in the high-tech sector (e.g. IT and R&D services) are registering above-average growth, growth in goods exports is being dampened in the euro area. As a case in point, goods exports to Italy have been declining sharply since 2012 and those to Germany have been stagnating. Above all, the exports of manufactured goods accounting for a share in total exports exceeding 20% and constitut-

<sup>2</sup> Growth in the demand for Austrian products is measured as the weighted import growth of Austria's trading partners.

Chart 2

## Exports

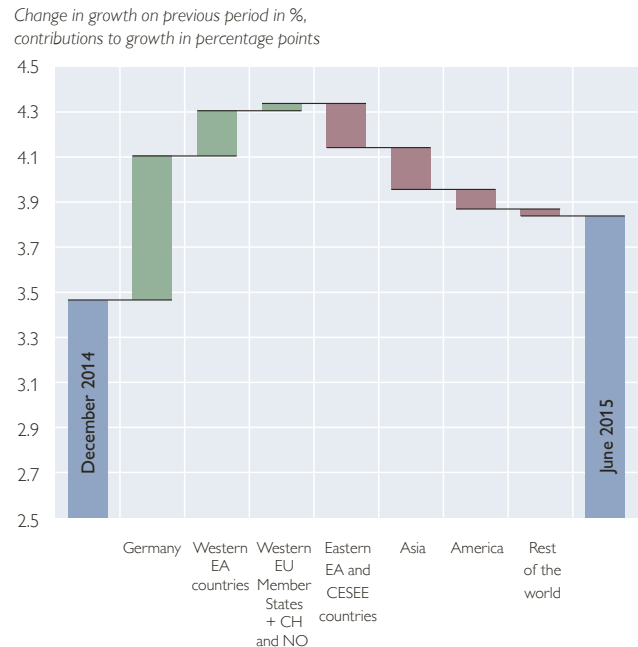
### Export growth and external demand



Source: ECB, OeNB (presentation and calculation).

Note: EA=euro area.

### Revisions of contributions to growth of Austrian export markets since the OeNB December 2014 outlook for 2015



ing a core component of Austrian exports were affected.

The loss of market shares is being accompanied by a decline in price competitiveness. Relative unit labor costs in Austria have deteriorated considerably in the past few years (+3% on 2011).<sup>3</sup> While hourly compensation in the Austrian economy as a whole has risen more strongly than in the euro area from 2012 onward, the reverse was true in the manufacturing sector. The development in hourly productivity was, however, worse in both the Austrian economy as a whole and the country's manufacturing sector than in the euro area.

Exporters from other countries (Poland, Hungary and the Czech Republic) have crowded out Austrian exporters particularly in their core German market and core export segments such as motor vehicle parts and accessories. In view of this structural change, the OeNB expects that Austria will continue to lose market shares in the coming years, albeit to a smaller extent. Despite the loss of market shares in the forecast period, the OeNB anticipates export growth to accelerate from +2.8% in 2015 to +4.8% in 2016 without any further increase in 2017. As a result, export momentum will remain well below the historical average rate of

<sup>3</sup> Compared with 36 industrialized countries. Source: AMECO database.

Table 3

### Growth and price developments in Austria's foreign trade

	2014	2015	2016	2017
<b>Exports</b>				
<i>Annual change in %</i>				
Competitor prices in Austria's export markets	-1.1	+3.5	+2.0	+2.0
Export deflator	+0.5	+1.2	+1.9	+1.9
Changes in price competitiveness	-1.5	+2.3	+0.1	+0.0
Import demand on Austria's export markets (real)	+3.4	+3.8	+5.3	+5.5
Austrian exports of goods and services (real)	+1.8	+2.8	+4.8	+4.8
Austrian market share	-1.6	-1.0	-0.5	-0.6
<b>Imports</b>				
International competitor prices on the Austrian market	-0.8	+3.4	+1.7	+1.7
Import deflator	-0.5	+0.4	+1.8	+1.9
Austrian imports of goods and services (real)	+2.2	+2.0	+4.7	+5.1
<b>Terms of Trade</b>				
	+1.0	+0.7	+0.0	+0.0
<i>Percentage points of real GDP growth</i>				
<b>Contribution of net exports to GDP growth</b>	-0.1	+0.5	+0.2	+0.1
<i>% of nominal GDP</i>				
<b>Foreign trade ratios</b>				
Export ratio	53.5	54.6	56.2	57.8
Import ratio	49.8	50.0	51.4	53.0

Source: 2014: Eurostat, Statistics Austria; 2015 to 2017: OeNB June 2015 outlook, Eurosystem.

Austrian export growth. Import growth will accelerate in tandem with expanding domestic demand in 2016/17. Net exports will therefore make only a very small contribution to GDP growth.

Although the Austrian current account has steadily deteriorated since 2010, at +0.8%, its balance was still in positive territory in 2014. At constant

balances of primary income (formerly, balance on income) and secondary income (formerly, balance on transfers), the improvement in the balance of goods and services – resulting from an acceleration in exports – is putting an end to the downtrend in the current account's development. The current account surplus will climb to 2.8% of GDP by 2017.

Table 4

### Austria's current account

	2014	2015	2016	2017
<i>% of nominal GDP</i>				
<b>Balance of trade</b>	2.4	3.0	3.8	4.6
Balance of goods	-0.7	-0.1	0.1	0.5
Balance of services	3.1	3.1	3.7	4.1
<b>Balance of primary income</b>	-0.6	-0.6	-0.6	-0.6
<b>Balance of secondary income</b>	-1.1	-1.1	-1.1	-1.1
<b>Current account</b>	0.8	1.3	2.1	2.8

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.



## 4.2 Investment is making a slow recovery

Austrian companies began to retrench their investment activity very severely in the second quarter of 2014. In the third and fourth quarter of 2014, gross fixed capital formation contracted in real terms by around  $-1.1\%$  on the previous quarter. The decline in the fourth quarter of 2014 covered every investment component. Investment in equipment was the worst hit ( $-2.4\%$  on the previous quarter). Residential construction investment was down by  $-1.1\%$ , with other nonresidential construction falling by  $-0.5\%$ . R&D investment stagnated.

The background to the current slowdown in investment is only partially understandable using traditional macroeconomic models. Although standard investment models such as the accelerator model, which ascribes investment activity primarily to GDP/export growth, explain the weak investment growth in 2012 and 2013 very well, they significantly overestimate the investment growth of the previous three quarters. Furthermore, other explanatory approaches such as the exist-

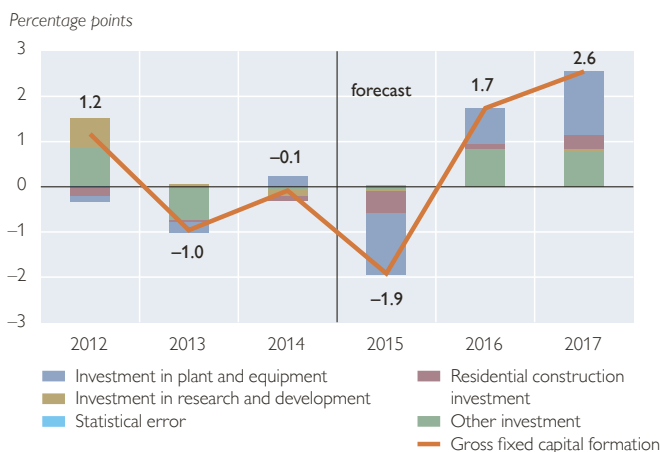
tence of financing bottlenecks do not offer any additional adequate explanation: corporate financial asset levels are high and financing conditions are exceptionally favorable; quantitative lending restraints are not likely to have had a significant dampening effect on investment in Austria, and there exist furthermore no signs of financial investment crowding out real investment, which would give rise to weaker investment activity. Current investment restraint is therefore likely to be associated with high uncertainty about future sales opportunities, which is particularly pronounced in Austria. Several factors are contributing to this feeling of insecurity. For instance, the Russia-Ukraine conflict and Austria's special focus on Eastern Europe are still likely to be key factors.

This confidence shock specific to Austria is expected to slowly dissipate in line with the economic recovery of Austria's most important export partner countries, the devaluation of the euro, the Eurosystem's growth-stimulating economic policy measures and increasing Austrian consumer demand. Nonetheless, in view of the negative

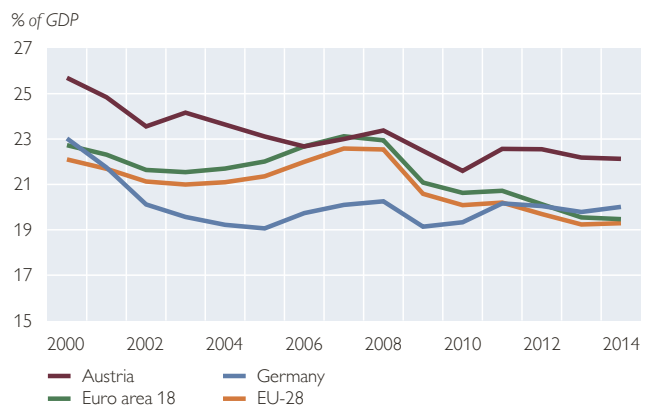
Chart 3

### Investment

#### Contributions to investment growth



#### Investment ratios of EU Member States



Source: Eurostat, OeNB.

Table 5

## Investment activity in Austria

	2014	2015	2016	2017
<i>Annual change in %</i>				
<b>Total gross fixed capital formation (real)</b>	-0.1	-1.9	+1.7	+2.6
<i>of which: investment in plant and equipment</i>	+0.7	-4.1	+2.4	+4.3
<i>residential construction investment</i>	-0.5	-2.5	+0.5	+1.6
<i>nonresidential construction investment and other investment</i>	-0.1	-0.3	+2.9	+2.7
<i>investment in research and development</i>	-0.8	-0.1	+0.2	+0.4
<i>public sector investment</i>	-3.5	+0.6	+1.0	+1.0
<i>private sector investment</i>	+0.4	-2.3	+1.9	+2.8
<i>Contribution to the growth of gross fixed capital formation in percentage points</i>				
Investment in plant and equipment	+0.2	-1.4	+0.8	+1.4
Residential construction investment	-0.1	-0.5	+0.1	+0.3
Nonresidential construction investment and other investment	+0.0	-0.1	+0.8	+0.8
Public sector investment	-0.5	+0.1	+0.1	+0.1
Private sector investment	+0.4	-2.0	+1.6	+2.4
<i>Contribution to real GDP growth in percentage points</i>				
Total gross fixed capital formation	+0.0	-0.4	+0.4	+0.5
Changes in inventories	-0.2	-0.1	+0.2	+0.1
<i>% of nominal GDP</i>				
<b>Investment ratio</b>	22.0	21.4	21.3	21.4

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

carry-over effect from 2014 and negative growth in the first quarter of 2015, investment will contract significantly in 2015 as a whole (-1.9% year on year). Investment activity is, however, expected to recover slowly in the second half of 2015. In 2016, investment will grow roughly in parallel with the expansion of the economy. Investment momentum is not expected to resume more significant pace before 2017. As past experience shows, the investment cycle will be fueled primarily by investment in equipment. In view of persistently low financing costs and an increased need for housing, residential construction investment is also expected to tick up toward the end of the forecast period. Although growth in civil engineering investment should gather pace again, its share of aggregate investment will remain below the historical average. Overall, the investment outlook is moderately cautious.

The investment-to-GDP ratio in Austria fell by some 4 percentage points between 1995 and 2014, reflecting the international trend. At around 22% of GDP in 2014, the level of Austrian investment is still one of the highest internationally, however. Only five EU Member States have a higher investment ratio than that of Austria, which is expected to drop slightly and then stabilize at around 21.4% in 2015.

### 4.3 Low inflation and tax reform package fuel private consumption

Austrian households have just emerged from a prolonged period of weak and, in some cases, falling real disposable household income, accompanied by sluggish consumption growth. Despite robust employment growth of +1.3%, real disposable household income shrank by -2.1% and private consumption by -0.2% in 2013. Growth in household income and consumption stagnated

in 2014 (+0.4% and +0.2%, respectively). In both 2013 and 2014, growth in disposable household income was badly affected by inflation, in particular.

At +1.8%, real disposable household income, as fueled by low inflation, is expected to rise sharply in 2015, with consumption growth edging up slightly to +0.4%. Nominal compensation per employee will climb slightly more steeply in 2015 than in 2014. Although wages per employee will increase somewhat more sharply for cyclical reasons in 2016 and particularly in 2017, inflation will also tick up considerably again. In view of the economic recovery anticipated for 2016 and 2017, employment growth will accelerate from +0.8% in 2015 to around +1.0%. Despite the economic upswing, invest-

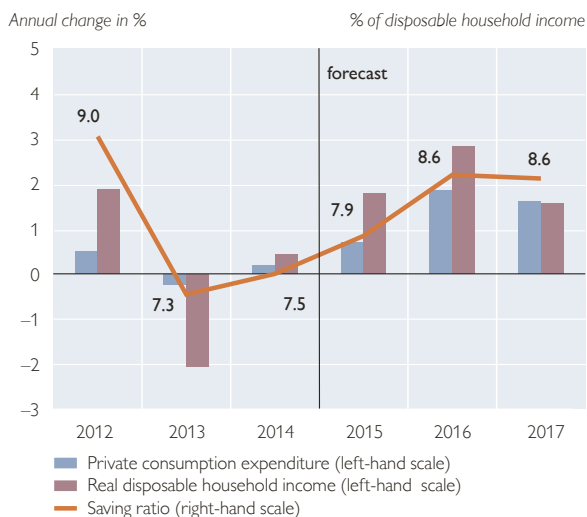
ment income and mixed income accruing to self-employed households will increase relatively weakly over the forecast period. The level of interest rates is historically extremely low, and companies are expected to undertake major replacement investment.

The most important stimulus for the development of both disposable household income and private consumption will come from the tax reform package in 2016 (box 2), which will provide substantial tax relief on real net income. Real disposable household income is expected to rise by 2.8%. This increase is much steeper than average growth in real disposable household income before the financial crisis (1995–2008 average: +2.2%).

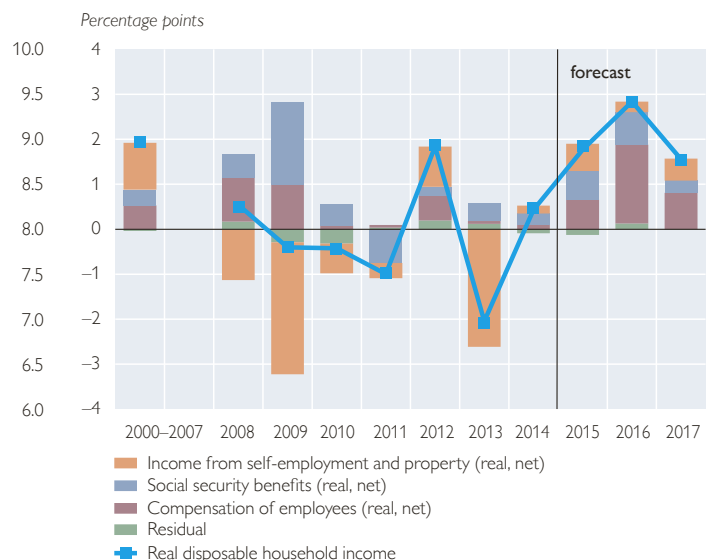
Chart 4

## Private consumption<sup>1</sup>

### Households' consumption expenditure



### Contributions to the growth of real disposable household income



Source: Eurostat, Statistics Austria, OeNB.

<sup>1</sup> Explanatory notes and data sources relating to chart 4, right-hand panel, "Compensation of employees (real, net)": compensation of employees less social contributions (actual and imputed, to government and private entities) of employers and employees as well as other wage-related taxes payable by employees (Statistics Austria data up to and including 2013, from 2014 onward update based on 2014 tax data and the OeNB outlook). "Social security benefits (real, net)": difference between monetary social security benefits received by households (including transfers from the private sector) less wage tax and social security contributions on pensions (data for wage tax and social security contributions on pensions based on wage tax statistics, combined with the OeNB outlook). "Property and self-employment income (real, net)": sum comprising property income (including interest) and mixed income accruing to self-employed households less withholding taxes on households' property income, assessed income tax and social security contributions of self-employed households (latter based on OeNB estimates). "Residual": primarily net contribution of other current transfers (e.g. nonlife insurance premiums and benefits, membership contributions, government grants to NPOs) as well as social security contributions and current direct taxes that were not taken into consideration above (in particular, motor vehicle taxes and parafiscal charges paid by households).

### Fiscal developments from 2014 to 2017<sup>1</sup>

The general government budget deficit grew by around 1 percentage point to just under 2½% of GDP in 2014. This increase was primarily attributable to two factors: first, the reorganization of Hypo Alpe-Adria-Bank International AG (HBIInt, overall deficit effect including capital increase in spring 2014 totaling 1.4% of GDP) and, second, the dissipation of the one-off effect arising from the mobile spectrum auction in 2013 (0.6% of GDP). Nonetheless, very subdued growth in current outlays and minor tax increases led to a relatively strong structural improvement in the budget balance. According to the European Commission, Austria marginally overfulfilled its medium-term budgetary objective of a structural balance of –0.45% of GDP in 2014. However, the reorganization of HBIInt translated into a further increase in the government debt ratio to some 84½% of GDP.

A roughly neutral fiscal policy strategy should be expected in 2015, as barely any new consolidation measures will enter into force and only some minor “offensive measures” (e.g. reduction in employers’ social contributions) will take effect. In view of the decline in capital transfers to banks (to ½% of GDP)<sup>2</sup>, however, the headline budget balance is expected to improve quite considerably despite cyclically weak growth in revenues. Nevertheless, the government debt ratio is expected to continue to rise as a result of a capital transfer from Kommunalkredit Austria AG to KA Finanz AG (“bad bank”), which is classified in the general government sector.

In the period from 2010 to 2014, the effect from the nominal fixing of wage and income tax brackets (“bracket creep”) made a critical contribution to consolidation. In 2016, in contrast, wage and income tax will be fairly substantially cut by the restructuring of tax brackets and by the increase in tax credits (together with higher negative taxes), which are to be counterfinanced by various minor tax increases, by spending cuts and measures against both tax and welfare fraud. In the main scenario of the OeNB’s June 2015 economic outlook, this tax reform package will generate a level effect for real GDP of somewhat below ½% for both 2016 and 2017, while the effect on the budget deficit (including “self-financing” through the play of automatic stabilizers) will stand at somewhat above ½% of GDP. The latter is primarily due to fact that, in view of an ESCB-wide guideline for fiscal projections, measures against tax and welfare fraud were not included in the OeNB’s June 2015 economic outlook.

Overall, a budget balance that is more or less constant (compared with 2015) is anticipated for 2016 and one that will improve to more than –1½% of GDP is expected for 2017 since positive cyclical effects and a further decline in capital transfers to banks will more than offset the negative budgetary effects of the tax reform package. The government debt ratio should decrease significantly in the same period thanks to higher nominal growth, the reduction in the debt levels of “bad banks” and to relatively low deficits.

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

<sup>2</sup> The projections of capital transfers to banks were taken from the Austrian Federal Ministry of Finance (strategy report on the federal medium-term expenditure framework)..

At +1.8% (2015), +2.8% (2016) and +1.6% (2017), growth in real disposable household income will be on the whole significantly higher in the forecast period than in previous years. A similar very robust growth profile is also anticipated for private consumption (2015: +0.7%; 2016: +1.8%; 2017: +1.6%).

The development in the saving ratio is being fueled by several factors. First,

consumers have the notion of an (even with the passage of time) “optimal” relationship between saving and consumption. Second, the saving ratio is also determined by the composition of disposable household income (investment income has a higher marginal saving ratio than earned income). In 2013, real disposable household income contracted more sharply than consumption, which was partly financed from

Table 6

### Private consumption in Austria

	2014	2015	2016	2017
<i>Annual change in %</i>				
Households' disposable income (nominal)	+2.2	+2.8	+4.7	+3.5
Consumption deflator	+1.7	+1.0	+1.8	+1.9
Households' disposable income (real)	+0.4	+1.8	+2.8	+1.6
Private consumption (real)	+0.2	+0.7	+1.8	+1.6
<i>Contribution to real GDP growth in percentage points</i>				
Private consumption	+0.1	+0.4	+1.0	+0.8
<i>% of households' nominal disposable income</i>				
Saving ratio	7.5	7.9	8.6	8.6
<i>% of nominal GDP</i>				
Consumption ratio	53.7	53.6	53.6	53.4

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

savings. The saving ratio declined from 9.0% in 2012 to 7.3% in 2013. 2014 saw an increase in real disposable household income (+0.4%), private consumption (+0.2%) and the saving ratio (+0.2 percentage points). For 2015 and 2016, the saving ratio is expected to rise to 7.9% and 8.6%, respectively. In 2016, the increase in the saving ratio – induced by the tax re-

form package – will be somewhat more vigorous than growth in the income components would imply. It is assumed that households will increase their total savings slightly disproportionately in view of their experience in recent years and thus will save part of their additional disposable household income generated by the tax reform package.

Table 7

### Determinants of Austrian households' nominal income

	2014	2015	2016	2017
<i>Annual change in %</i>				
Payroll employment	+0.8	+0.8	+1.1	+1.0
Wages and salaries per employee	+1.8	+1.9	+2.0	+2.3
Compensation of employees	+2.6	+2.7	+3.1	+3.4
Property income	+4.3	+2.9	+3.9	+4.0
Self-employment income and operating surpluses (net)	+2.4	+3.2	+3.6	+3.7
<i>Contribution to households' disposable income in percentage points</i>				
Compensation of employees	+2.1	+2.2	+2.6	+2.8
Property income	+0.5	+0.4	+0.5	+0.5
Self-employment income and operating surpluses (net)	+0.4	+0.5	+0.6	+0.6
Net transfers less direct taxes <sup>1</sup>	-0.9	-0.2	+1.0	-0.4
Households' disposable income (nominal)	+2.2	+2.8	+4.7	+3.5

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

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

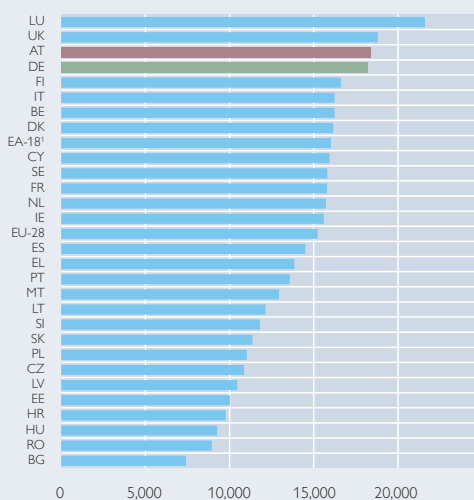
### Private consumption in Germany and Austria: Austria falls behind amid higher inflation<sup>1</sup>

Austria and Germany both have a very high level of consumption spending by international standards. In 2013, the two countries were in third and fourth position within the EU in terms of per capita consumption as measured in purchasing power parities. In the period from 2001 to 2010, private consumption in Austria grew 1 percentage point faster per year than in Germany. Since 2011, however, consumption growth has almost come to a standstill in Austria while accelerating in Germany, where it is now 1 percentage point higher than in Austria.

#### International comparison of private consumption

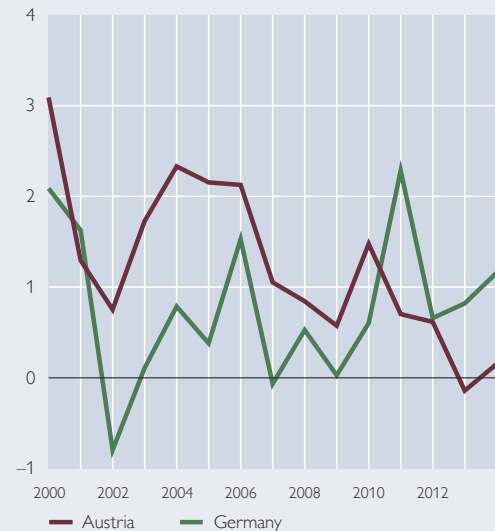
##### Consumption per inhabitant (2013)

EUR per capita at PPPs



##### Development of real private consumption

Annual change in %

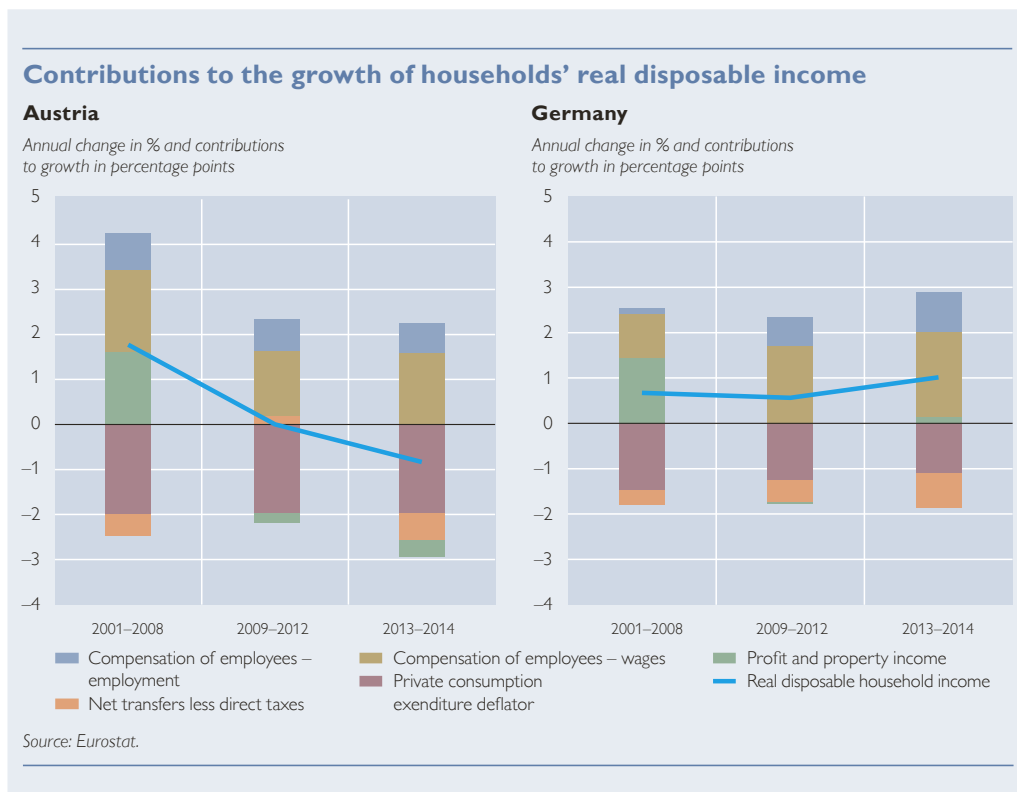


Source: Eurostat.

<sup>1</sup> EA=euro area.

Between 2001 and 2008, real disposable household income almost stagnated in Germany while registering robust growth in Austria. During the economic and financial crisis and the period of economic recovery from 2009 to 2012, growth in real disposable household income dried up in Austria while recording an annual average rate of +0.6% in Germany. The growth differential is wholly explicable by higher inflation in Austria, as income components developed on a very similar track in both countries. In the previous two years (2013 and 2014), real disposable household income contracted in Austria (-0.8% per year), whereas it accelerated to +1.0% per year in Germany. In addition to weaker wage growth, the inflation gap (almost 1 percentage point) between Austria and Germany continued to play a critical role.

<sup>1</sup> Prepared by Martin Schneider, Economic Analysis Division, martin.schneider@oenb.at.



## 5 Unemployment remains elevated

As in previous years, employment – despite the fragile economy – grew surprisingly robustly in 2014, with a further rise in both the number of employees (+0.8% year on year) and the annual hours worked (+0.7% year on year). According to the national accounts, around 3.7 million persons overall were payroll employees (some +28,600 persons year on year). In 2014, the number of annual hours worked by payroll employees exceeded the pre-crisis level of 2008 for the first time since the crisis. At the same time, the number of unemployed persons also reached a historical high, with some

246,000 persons unemployed (national accounts definition). The unemployment rate (Eurostat definition) climbed to 5.6% in 2014 (2013: 5.4%).<sup>4</sup>

In 2015, the growth rate of the number of payroll employees will remain unchanged from 2014 at +0.8%. Although employment growth is expected to accelerate considerably to +1.1% in 2016 for cyclical reasons, it will decelerate to +1.0% in 2017.

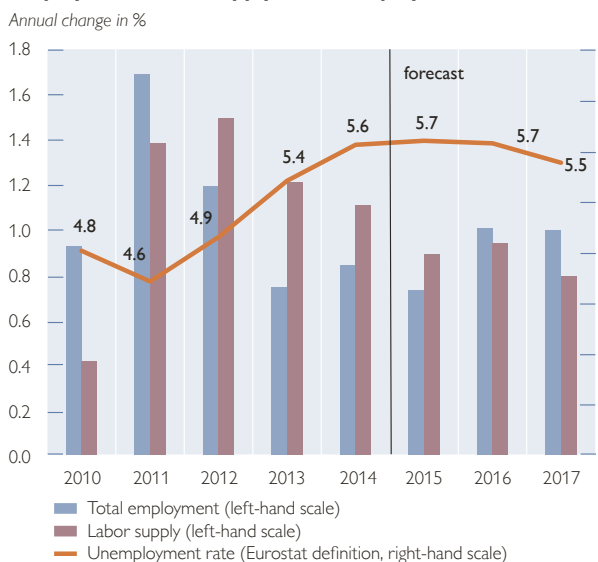
Labor supply will continue to climb in each year of the forecast period. Although growth momentum will be somewhat more sluggish unlike recent years, it will still remain high overall at around +0.9% per year. In addition to cyclical factors, structural factors are

<sup>4</sup> The unemployment rate (Eurostat definition) was sharply revised upward in March 2015. The data used to calculate the unemployment rate were derived from the European labor force survey, which was carried out in Austria as part of the Austrian microcensus. The projections from this survey were subject to revisions, which go as far back as 2004. The “nonresponses” were reclassified and reweighted. Before the revision, the Austrian unemployment rate stood at 5.0% in 2014. After the revision, the Austrian unemployment rate in 2013 and 2014 was no longer the lowest in the EU but the second-lowest after the German rate (5.2% and 5.0%, respectively).

Chart 5

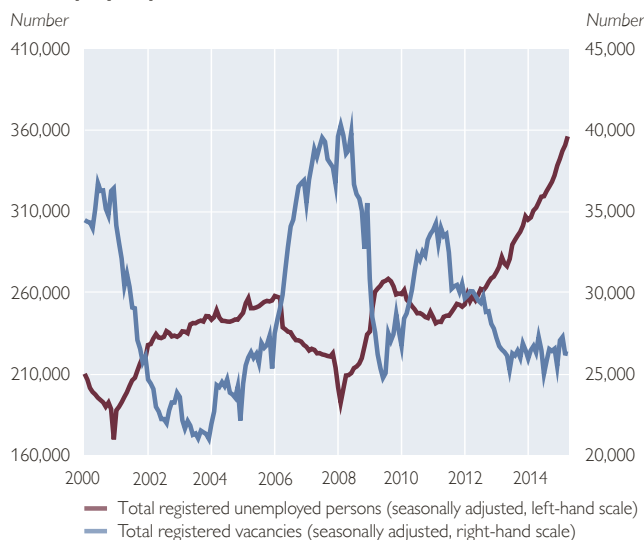
## Labor market

### Employment, labor supply and unemployment rate



Source: OeNB, Statistics Austria.

### Unemployed persons and vacancies



Source: Public Employment Service Austria, OeNB.

also playing a key role. Since 2012, overall employment growth in Austria has been driven by part-time jobs, while the number of full-time jobs has been falling. The labor force participation rate of older employees continues to increase. Although the influx of foreign labor will slow, it will remain high overall. In 2015, the unemployment

rate (Eurostat definition) will further climb (+5.7%) on the back of weak economic momentum and expanding labor supply. As in the past, unemployment will follow GDP growth with a lag, which means a modest decline in unemployment is not expected before 2017 (+5.5%).

Table 8

### Labor market developments in Austria

	2014	2015	2016	2017
<i>Annual change in %</i>				
<b>Total employment</b>	+0.8	+0.7	+1.0	+1.0
of which: payroll employees	+0.8	+0.8	+1.1	+1.0
public sector employees	+0.0	+0.0	+0.0	+0.0
self-employed	+1.2	+0.4	+0.6	+0.9
<b>Total hours worked</b>	+0.7	+0.6	+0.9	+0.9
of which: payroll employees	+0.7	+0.7	+1.0	+0.9
self-employed	+1.0	+0.1	+0.8	+0.6
<b>Labor supply</b>	+1.1	+0.9	+0.9	+0.8
Registered unemployed	+6.0	+3.6	-0.2	-2.6
<i>% of labor supply</i>				
<b>Unemployment rate (Eurostat definition)</b>	5.6	5.7	5.7	5.5

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.



## 6 Inflation much weaker in 2015 than in previous years but expected to rise in 2016 and 2017

Inflation eased to +1.5% in 2014 (2013: +2.1%) and has so far continued to fall in 2015. This drop was primarily attributable to declining energy prices. HICP inflation stood at +0.9% in April 2015 (HICP, preliminary data), thereby falling well below its annual level for 2014. Despite this low value, however, Austria had the second-highest inflation rate in the euro area after Malta. The average price level flatlined in the euro area (HICP: 0.0%) and climbed by a mere +0.3% in Germany. Austria's inflation gap vis-à-vis the euro area – and vis-à-vis Germany – has now persisted for quite some time and is a major explanatory factor for the country's relatively poor growth performance.

Starting from around USD 100 per barrel Brent in 2014, oil prices – whose projected development is based on futures prices – will tumble sharply to

some USD 64 in 2015, recover slightly to about USD 70 in 2016 and remain almost unchanged in 2017. The economy will only regain momentum from 2016, triggering a modest increase in domestic price pressures. Although this means HICP inflation will register a (by Austrian standards) very small rise of +0.9% in 2015, it will stand at +1.9% in 2016 and +2.0% in 2017.

Although gross compensation per employee grew by +1.8% in nominal terms in 2014, it fell by –0.2% in real terms. Owing to negative wage drift, gross compensation per employee grew much more slowly than collective wage agreements (+2.4%) would have led one to expect. Wage drift is being induced by sectoral shifts in employment to low-wage sectors and by a growing share of part-time employees. Wage settlements for 2015 (public sector: +1.8%, commercial sector: +2.0%, metal sector: +2.0%) suggest growth in collectively agreed wages of +2.3%. Since the development in collectively

Table 9

### Price, cost, productivity and profit indicators for Austria

	2014	2015	2016	2017
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+1.5	+0.9	+1.9	+2.0
HICP energy	–2.2	–5.8	+1.9	+2.1
HICP excluding energy	+1.8	+1.6	+1.9	+1.9
Private consumption expenditure deflator	+1.7	+1.0	+1.8	+1.9
Investment deflator	+1.3	+1.1	+1.5	+1.6
Import deflator	–0.5	+0.4	+1.8	+1.9
Export deflator	+0.5	+1.2	+1.9	+1.9
Terms of trade	+1.0	+0.7	+0.0	+0.0
GDP deflator at factor cost	+1.8	+1.2	+1.7	+1.8
Collective wage and salary settlements	+2.4	+2.3	+2.3	+2.5
Compensation per employee	+1.8	+1.9	+2.0	+2.3
Hourly compensation per employee	+1.9	+2.0	+2.1	+2.4
Labor productivity per employee	–0.4	+0.0	+0.9	+0.8
Labor productivity per hour	–0.3	+0.1	+0.9	+0.9
Unit labor costs	+2.2	+1.9	+1.2	+1.5
Profit margins <sup>1</sup>	–0.4	–0.7	+0.5	+0.3

Source: 2014: Eurostat, Statistics Austria; 2015 to 2017: OeNB June 2015 outlook.

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

Table 10

### Compensation of employees

	2014	2015	2016	2017
<i>Annual change in %</i>				
<b>Per person employed (nominal)</b>				
Collectively agreed wages and salaries <sup>1</sup>	+2.4	+2.3	+2.3	+2.5
Wage drift	-0.6	-0.4	-0.3	-0.2
Compensation per employee (gross) <sup>2</sup>	+1.8	+1.9	+2.0	+2.3
Compensation per employee (net)	+1.1	+1.6	+4.5	+2.6
<b>Per person employed (real)</b>				
Compensation per employee (gross)	+0.0	+0.8	+0.2	+0.5
Compensation per employee (net)	-0.6	+0.6	+2.7	+0.7
<b>Per hour (nominal)</b>				
Compensation per hour (gross)	+1.9	+2.0	+2.1	+2.4
Compensation per hour (net)	+1.2	+1.7	+4.6	+2.7
<b>Per hour (real)</b>				
Compensation per hour (gross)	+0.1	+0.9	+0.4	+0.6
Compensation per hour (net)	-0.5	+0.7	+2.8	+0.8
<i>% of nominal GDP</i>				
<b>Wage share</b>	48.1	48.4	48.2	48.0

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

<sup>1</sup> Overall economy.

<sup>2</sup> Including employers' social security contributions.

agreed wages is also influenced by past inflation, an increase of equal proportions is forecast for 2016 despite a significant acceleration of the economy; the further uptick in inflation and the upswing in the economy signal more vigorous growth in collectively agreed

wages (+2.5%) in 2017. Although wage drift is exhibiting a negative long-term trend, it is procyclical and will gradually shrink in the forecast period.

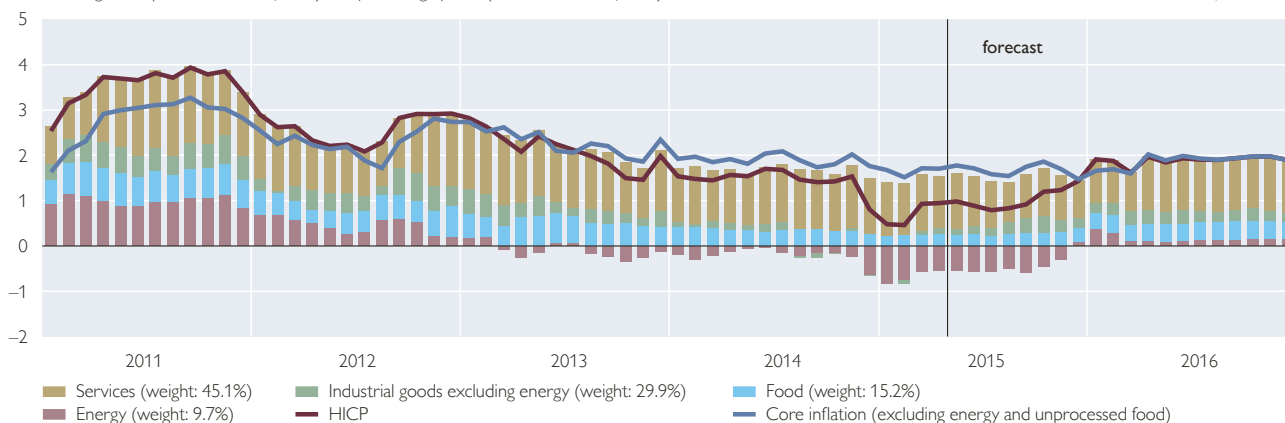
Including the effects of bracket creep, net compensation per employee fell by -0.6% and hourly pay by -0.5%

Chart 6

### Austrian HICP inflation rate and contributions of subcomponents

Annual change in % (HICP and core inflation) and percentage points (contributions to inflation)

Last observation: 0.9% (April 2015)



Source: OeNB, Statistics Austria, Eurostat.

in 2014. Net real wages are expected to climb back in view of lower inflation in 2015 and the tax reform package in 2016. Despite the economy forging ahead in 2016 and 2017, a policy of wage moderation is assumed during the economic recovery. The wage share of GDP will consequently decrease from 48.4% in 2015 to 48.0% in 2017.

## 7 Risks at a high level, pointing down in 2015 and balanced in 2016

This forecast is subject to a number of risks. The most significant domestic risk to GDP growth in 2015 depends on whether the crisis of confidence in Austria will actually dissipate in the course of 2015 – as assumed by this forecast – and if the economy will recover in line with developments in the

global macroeconomic environment and with real income growth. These two factors will affect particularly the investment cycle and private consumption growth. In 2016 and 2017, the most significant domestic risk will come from the impact arising from the introduction of the tax reform package. Consumers could be so unsettled by their experience of declining real income in the past few years that they save a share of their additional disposable real household income that exceeds that supposed in this forecast. A further downside risk exists in that the loss of competitiveness assumed in the forecast period as a whole could be more severe than expected.

The most significant risks to this forecast arising from the global macroeconomic environment still stem from

Table 11

### Change in the external economic conditions since the OeNB December 2014 outlook

	June 2015			December 2014		Difference	
	2015	2016	2017	2015	2016	2015	2016
<i>Annual change in %</i>							
Growth of Austria's export markets	+3.8	+5.3	+5.5	+3.4	+5.0	+0.4	+0.3
Competitor prices on Austria's export markets	+3.5	+2.0	+2.0	+0.6	+1.3	+2.9	+0.7
Competitor prices on Austria's import markets	+3.4	+1.7	+1.7	+0.9	+1.2	+2.5	+0.5
<i>USD per barrel (Brent)</i>							
Oil price	63.8	71.0	73.1	85.6	88.5	-21.8	-17.5
<i>Annual change in %</i>							
Nominal effective exchange rate (exports)	+2.9	+0.2	+0.0	+0.5	+0.0	+2.4	+0.2
Nominal effective exchange rate (imports)	+2.7	+0.1	+0.0	+0.5	+0.0	+2.2	+0.1
<i>%</i>							
Three-month interest rate	0.0	0.0	0.2	0.1	0.1	-0.1	-0.1
Long-term interest rate	0.8	1.1	1.3	1.1	1.4	-0.3	-0.3
<i>Annual change in %</i>							
U.S. GDP (real)	+2.6	+3.1	+2.7	+2.8	+3.0	-0.2	+0.1
<i>USD/EUR</i>							
USD/EUR exchange rate	1.12	1.12	1.12	1.25	1.25	-0.13	-0.13

Source: Eurosystem.

the aggravation of persisting geopolitical tensions. In this context, a further escalation of the conflict between Russia and Ukraine represents the greatest risk to the economy. Although the current sanctions are not directly impacting Austrian external trade, an escalation of the situation could jeopardize economic activity in Europe and thus further influence business confidence in Austria unfavorably. Likewise, future developments in Greece constitute a risk. Outside of Europe, the most significant risk is that of a faster interest-rate tightening cycle, i.e. U.S. interest rate hikes occurring more quickly than expected, which could trigger capital outflows from developing countries.

## 8 Forecast unchanged on December outlook for 2015 but revised up for 2016

The assumptions about the global macroeconomic environment underlying this outlook have improved since December 2014. Austrian export growth will be 0.4 percentage points higher in 2015 than anticipated in December

2014. Competitor prices in Austrian export markets rose steeply (+2.9 percentage points) compared with the December 2014 economic outlook. The fragility of the global economy, in conjunction with substantial supply-side growth, triggered considerably lower oil prices. Quantitative monetary easing – in this context, particularly the Eurosystem’s new asset purchase program – resulted in further historical lows for interest rates. Furthermore, the Eurosystem’s measures induced a sharp devaluation of the euro.

The effects of these new external assumptions were simulated using the OeNB macroeconomic model. Table 12 lists the reasons for revising the outlook in detail. Apart from the effects of changed external assumptions, the revisions 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 2014) and the forecasting errors of the previous outlook for the periods now published for the

Table 12

### Breakdown of revisions to the OeNB outlook

	GDP		HICP	
	2015	2016	2015	2016
<i>Annual change in %</i>				
Outlook of June 2015	+0.7	+1.9	+0.9	+1.9
Outlook of December 2014	+0.7	+1.6	+1.4	+1.5
Difference	0.0	+0.3	-0.5	+0.4
<i>Percentage points</i>				
Caused by:				
External assumptions	+0.2	+0.2	-0.5	+0.0
New data <sup>1</sup>	-0.1	+0.0	+0.0	+0.0
of which: revisions to historical data up to Q3 14	+0.0		+0.0	
projection errors for Q4 14 and Q1 15	-0.1		+0.0	
Other changes <sup>2</sup>	-0.1	+0.1	+0.0	+0.4

Source: OeNB outlooks of June 2015 and December 2014.

<sup>1</sup> „New data“ refer to data on GDP growth and/or inflation that have become available since the publication of the preceding OeNB outlook.

<sup>2</sup> Different assumptions with respect to trends in domestic variables, such as wages and salaries, public sector consumption, effects of tax measures, other changes to assessments and model changes.

first time (i.e. data for the fourth quarter of 2014 and the first quarter of 2015). The residual includes revised expert opinions regarding the development of domestic variables such as government consumption or wage settlements, as well as any changes to the model.

The growth prospects for 2015 were left unchanged on the previous outlook of December 2014. The global macroeconomic environment has since improved considerably both on the demand and price side. In purely technical terms, this improvement would mean an upward revision of GDP growth in 2015 by some +0.2 percentage points. The GDP growth outlook for the first quarter of 2015 stood at +0.2% in December 2014. At around +0.1%, GDP growth continued to lag behind expectations, however. This situation mirrors the deterioration in economic sentiment in Austria, compared with most other euro area countries. In view of this confidence shock, GDP growth for 2015 as a whole is expected to decline by some 0.1 percentage points. Data realization will have a neg-

ative effect of about 0.1 percentage points on GDP growth in 2015 (only rounded figures are shown in table 12).

From a purely technical perspective, the development of external assumptions compared with the previous outlook would result in an upward revision of +0.2 percentage points for 2016. In view of current experience (crisis of confidence, trend of the investment cycle, losses in market shares in Austrian export markets), however, these assumptions were not included in the present outlook. The previous outlook did not include the growth-stimulating effects of the tax reform package, which ultimately led to the upward revision of GDP growth compared with the December outlook of +0.3 percentage points.

The downward revision of inflation in 2015 can be explained by lower commodity prices. The upward revision of inflation in 2016 is driven by two factors: first, the tax reform package whose effects are now included unlike in the previous outlook and, second, brighter prospects for the economy.

### Comparison of the OeNB outlook of June 2015 with the OeNB outlook of December 2014

	Actual figures	Outlook of June 2015			Outlook of December 2014		
	2014	2015	2016	2017	2014	2015	2016
<b>Economic activity</b>							
<i>Annual change in % (real)</i>							
Gross domestic product (GDP)	+0.4	+0.7	+1.9	+1.8	+0.4	+0.7	+1.6
Private consumption	+0.2	+0.7	+1.8	+1.6	+0.5	+0.7	+1.3
Public sector consumption	+1.0	+0.9	+0.9	+1.1	+1.0	+1.4	+1.3
Gross fixed capital formation	-0.1	-1.9	+1.7	+2.6	-0.1	+0.8	+2.3
Exports of goods and services	+1.8	+2.8	+4.8	+4.8	+0.8	+2.4	+4.6
Imports of goods and services	+2.2	+2.0	+4.7	+5.1	+0.5	+2.5	+4.7
<i>% of nominal GDP</i>							
Current account balance	+0.8	+1.3	+2.1	+2.8	+0.4	+0.6	+0.8
<b>Contribution to real GDP growth</b>							
<i>Percentage points</i>							
Private consumption	+0.1	+0.4	+1.0	+0.8	+0.3	+0.4	+0.7
Public sector consumption	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3
Gross fixed capital formation	+0.0	-0.4	+0.4	+0.5	+0.0	+0.2	+0.5
Domestic demand (excl. changes in inventories)	+0.3	+0.1	+1.5	+1.6	+0.5	+0.8	+1.4
Net exports	-0.1	+0.5	+0.2	+0.1	+0.2	+0.1	+0.2
Changes in inventories (incl. statistical discrepancies)	+0.3	+0.0	+0.1	+0.1	-0.2	-0.2	+0.0
<b>Prices</b>							
<i>Annual change in %</i>							
Harmonised Index of Consumer Prices (HICP)	+1.5	+0.9	+1.9	+2.0	+1.5	+1.4	+1.5
Private consumption expenditure (PCE) deflator	+1.7	+1.0	+1.8	+1.9	+1.7	+1.4	+1.5
GDP deflator	+1.7	+1.3	+1.8	+1.9	+1.8	+1.6	+1.3
Unit labor costs in the overall economy	+2.2	+1.9	+1.2	+1.5	+2.4	+1.3	+1.2
Compensation per employee (at current prices)	+1.8	+1.9	+2.0	+2.3	+2.0	+1.5	+2.2
Compensation per hour worked (at current prices)	+1.9	+2.0	+2.1	+2.4	+2.2	+1.7	+2.3
Import prices	-0.5	+0.4	+1.8	+1.9	-0.6	+1.0	+1.6
Export prices	+0.5	+1.2	+1.9	+1.9	+0.8	+1.1	+1.5
Terms of trade	+1.0	+0.7	+0.0	+0.0	+1.4	+0.0	-0.1
<b>Income and savings</b>							
Real disposable household income	+0.4	+1.8	+2.8	+1.6	+0.1	+1.1	+1.4
<i>% of households' nominal disposable income</i>							
Saving ratio	7.5	7.9	8.6	8.6	6.8	7.1	7.2
<b>Labor market</b>							
<i>Annual change in %</i>							
Payroll employment	+0.8	+0.8	+1.1	+1.0	+0.7	+0.4	+0.6
Hours worked (payroll employees)	+0.7	+0.7	+1.0	+0.9	+0.5	+0.2	+0.5
<i>% of labor supply</i>							
Unemployment rate (Eurostat definition) <sup>1</sup>	5.6	5.7	5.7	5.5	5.1	5.3	5.3
<b>Public finances</b>							
<i>% of nominal GDP</i>							
Budget balance	-2.4	-1.8	-1.8	-1.4	-2.4	-1.8	-1.4
Government debt	84.5	85.7	83.8	81.6	85.4	84.6	82.9

Source: 2014: Eurostat; 2015 to 2016: OeNB outlooks of June 2015 and December 2014.

<sup>1</sup> Following the backward revision of the Austrian microcensus labor force survey data and the resulting shift in the unemployment rate levels in March 2015, the forecast unemployment rates are no longer comparable.

## Annex: detailed result tables

Table 14

### Demand components (real prices)

Chained volume data (reference year = 2010)

	2014	2015	2016	2017	2014	2015	2016	2017
	EUR million				Annual change in %			
Private consumption	161,100	162,208	165,206	167,873	0.2	0.7	1.8	1.6
Government consumption	61,312	61,894	62,480	63,197	1.0	0.9	0.9	1.1
Gross fixed capital formation	67,360	66,068	67,218	68,933	-0.1	-1.9	1.7	2.6
of which: investment in plant and equipment	22,521	21,602	22,122	23,071	0.7	-4.1	2.4	4.3
residential construction investment	12,908	12,580	12,648	12,846	-0.5	-2.5	0.5	1.6
nonresidential construction investment and other investment	18,634	18,583	19,123	19,634	-0.1	-0.3	2.9	2.7
Changes in inventories (incl. statistical discrepancies)	5,718	5,847	6,218	6,576	x	x	x	x
Domestic demand	295,491	296,016	301,122	306,579	0.6	0.2	1.7	1.8
Exports of goods and services	166,318	170,989	179,144	187,776	1.8	2.8	4.8	4.8
Imports of goods and services	153,212	156,288	163,680	171,972	2.2	2.0	4.7	5.1
Net exports	13,106	14,701	15,464	15,804	x	x	x	x
<b>Gross domestic product</b>	<b>308,597</b>	<b>310,717</b>	<b>316,586</b>	<b>322,383</b>	<b>0.4</b>	<b>0.7</b>	<b>1.9</b>	<b>1.8</b>

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

Table 15

### Demand components (current prices)

	2014	2015	2016	2017	2014	2015	2016	2017
	EUR million				Annual change in %			
Private consumption	177,124	180,163	186,783	193,341	+1.9	+1.7	+3.7	+3.5
Government consumption	65,403	67,000	68,507	70,373	+2.3	+2.4	+2.2	+2.7
Gross fixed capital formation	72,651	72,062	74,434	77,547	+1.2	-0.8	+3.3	+4.2
Changes in inventories (incl. statistical discrepancies)	2,156	1,567	2,439	3,240	x	x	x	x
Domestic demand	317,334	320,793	332,162	344,502	+1.9	+1.1	+3.5	+3.7
Exports of goods and services	176,422	183,500	195,816	209,169	+2.2	+4.0	+6.7	+6.8
Imports of goods and services	164,147	168,146	179,302	191,894	+1.6	+2.4	+6.6	+7.0
Net exports	12,275	15,354	16,513	17,274	x	x	x	x
<b>Gross domestic product</b>	<b>329,609</b>	<b>336,147</b>	<b>348,675</b>	<b>361,776</b>	<b>+2.2</b>	<b>+2.0</b>	<b>+3.7</b>	<b>+3.8</b>

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

Table 16

### Demand components (deflators)

	2014	2015	2016	2017	2014	2015	2016	2017
	2010 = 100				Annual change in %			
Private consumption	109.9	111.1	113.1	115.2	+1.7	+1.0	+1.8	+1.9
Government consumption	106.7	108.2	109.6	111.4	+1.3	+1.5	+1.3	+1.6
Gross fixed capital formation	107.9	109.1	110.7	112.5	+1.3	+1.1	+1.5	+1.6
Domestic demand (excl. changes in inventories)	108.8	110.0	111.8	113.8	+1.5	+1.1	+1.6	+1.7
Exports of goods and services	106.1	107.3	109.3	111.4	+0.5	+1.2	+1.9	+1.9
Imports of goods and services	107.1	107.6	109.5	111.6	-0.5	+0.4	+1.8	+1.9
Terms of trade	99.0	99.7	99.8	99.8	+1.0	+0.7	+0.0	+0.0
<b>Gross domestic product</b>	<b>106.8</b>	<b>108.2</b>	<b>110.1</b>	<b>112.2</b>	<b>+1.7</b>	<b>+1.3</b>	<b>+1.8</b>	<b>+1.9</b>

Source: 2014: Eurostat; 2015 to 2017: OeNB June 2015 outlook.

Table 17

### Labor market

	2014	2015	2016	2017	2014	2015	2016	2017
	Thousands				Annual change in %			
Total employment	4,296.4	4,327.7	4,371.1	4,414.5	+0.8	+0.7	+1.0	+1.0
of which: private sector	3,626.8	3,658.1	3,701.8	3,745.5	+1.0	+0.9	+1.2	+1.2
Payroll employment (national accounts definition)	3,699.7	3,728.6	3,768.3	3,806.2	+0.8	+0.8	+1.1	+1.0
	% of the labor supply							
Unemployment rate (Eurostat definition)	5.6	5.7	5.7	5.5	x	x	x	x
	EUR per real unit of output x 100							
Unit labor costs (economy as a whole) <sup>1</sup>	59.7	60.8	61.5	62.5	+2.2	+1.9	+1.2	+1.5
	EUR thousand per employee							
Labor productivity (economy as a whole) <sup>2</sup>	71.8	71.8	72.4	73.0	-0.4	+0.0	+0.9	+0.8
	EUR thousand							
Compensation per employee (real) <sup>3</sup>	39.0	39.3	39.4	39.6	+0.0	+0.8	+0.2	+0.5
	At current prices in EUR thousand							
Compensation per employee (gross)	42.9	43.7	44.6	45.6	+1.8	+1.9	+2.0	+2.3
	At current prices in EUR million							
Total gross compensation of employees	158,646	162,852	167,947	173,613	+2.6	+2.7	+3.1	+3.4

Source: 2014: Eurostat, 2015 to 2017: OeNB June 2015 outlook.

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

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

<sup>3</sup> Gross wages and salaries per employee divided by private consumption expenditure deflator.



Table 18

## Current account

	2014	2015	2016	2017	2014	2015	2016	2017
	EUR million				% of nominal GDP			
<b>Balance of trade</b>	8,014.0	9,983.7	13,262.0	16,512.4	2.4	3.0	3.8	4.6
Balance of goods	-2,346.0	-366.8	366.3	1,834.7	-0.7	-0.1	0.1	0.5
Balance of services	10,360.0	10,350.6	12,895.6	14,677.7	3.1	3.1	3.7	4.1
<b>Balance on income</b>	-1,905.0	-1,955.5	-2,191.6	-2,191.6	-0.6	-0.6	-0.6	-0.6
<b>Balance of transfer payments</b>	-3,553.0	-3,779.3	-3,779.3	-4,051.0	-1.1	-1.1	-1.1	-1.1
<b>Balance on current account</b>	2,556.0	4,249.0	7,291.1	10,269.9	0.8	1.3	2.1	2.8

Source: 2014: Eurostat, 2015 bis 2017: OeNB June 2015 outlook.

Table 19

## Quarterly outlook results

	2015	2016	2017	2015				2016				2017			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Prices, wages and costs</b>															
<i>Annual change in %</i>															
HICP	+0.9	+1.9	+2.0	+0.6	+0.9	+0.8	+1.3	+1.8	+1.9	+1.9	+1.9	+2.1	+1.9	+2.0	+1.9
HICP (excluding energy)	+1.6	+1.9	+1.9	+1.6	+1.7	+1.6	+1.7	+1.7	+2.0	+1.9	+2.0	+2.1	+1.9	+2.0	+1.9
Private consumption expenditure (PCE) deflator	+1.0	+1.8	+1.9	+1.1	+1.0	+0.9	+1.1	+1.6	+1.8	+1.9	+1.9	+1.9	+1.9	+1.9	+1.9
Gross fixed capital formation deflator	+1.1	+1.5	+1.6	+1.1	+1.1	+1.1	+1.2	+1.3	+1.5	+1.6	+1.6	+1.6	+1.6	+1.6	+1.6
GDP deflator	+1.3	+1.8	+1.9	+1.4	+1.2	+1.2	+1.3	+1.5	+1.7	+1.9	+2.0	+1.9	+1.9	+1.9	+1.9
Unit labor costs	+1.9	+1.2	+1.5	+1.8	+2.1	+2.0	+1.8	+1.7	+1.1	+0.9	+0.9	+1.1	+1.3	+1.7	+1.9
Nominal wages per employee	+1.9	+2.0	+2.3	+1.2	+2.0	+2.0	+2.2	+2.6	+1.9	+1.8	+1.9	+2.1	+2.3	+2.4	+2.5
Productivity	+0.0	+0.9	+0.8	-0.5	-0.1	+0.1	+0.4	+0.8	+0.8	+0.9	+1.0	+1.0	+0.9	+0.8	+0.6
Real wages per employee	+0.8	+0.2	+0.5	+0.2	+1.0	+1.1	+1.1	+1.0	+0.1	+0.0	+0.0	+0.3	+0.4	+0.6	+0.6
Import deflator	+0.4	+1.8	+1.9	-0.5	+0.2	+0.7	+1.4	+1.9	+1.8	+1.8	+1.8	+1.8	+1.8	+1.9	+1.9
Export deflator	+1.2	+1.9	+1.9	+0.9	+1.1	+1.3	+1.4	+1.7	+1.8	+1.9	+2.0	+2.0	+1.9	+1.9	+1.8
Terms of trade	+0.7	+0.0	+0.0	+1.4	+0.9	+0.6	+0.1	-0.2	+0.1	+0.1	+0.2	+0.1	+0.1	+0.0	-0.1
<b>Economic activity</b>															
<i>Annual and/or quarterly changes in % (real)</i>															
GDP	+0.7	+1.9	+1.8	+0.1	+0.3	+0.4	+0.4	+0.5	+0.5	+0.6	+0.6	+0.5	+0.4	+0.3	+0.3
Private sector consumption	+0.7	+1.8	+1.6	+0.1	+0.2	+0.3	+0.4	+0.5	+0.5	+0.5	+0.5	+0.3	+0.3	+0.3	+0.3
Public sector consumption	+0.9	+0.9	+1.1	+0.3	+0.1	+0.2	+0.2	+0.1	+0.3	+0.4	+0.5	+0.3	+0.2	+0.1	+0.0
Gross fixed capital formation	-1.9	+1.7	+2.6	-0.6	-0.1	+0.2	+0.4	+0.5	+0.5	+0.7	+0.7	+0.7	+0.6	+0.5	+0.5
Exports	+2.8	+4.8	+4.8	+0.7	+0.9	+1.0	+1.2	+1.2	+1.3	+1.3	+1.2	+1.2	+1.1	+1.2	+1.2
Imports	+2.0	+4.7	+5.1	+0.8	+0.6	+1.0	+1.1	+1.2	+1.3	+1.3	+1.3	+1.2	+1.2	+1.2	+1.2
<i>Contribution to real GDP growth in percentage points</i>															
Domestic demand	+0.1	+1.5	+1.6	+0.0	+0.1	+0.3	+0.3	+0.4	+0.4	+0.5	+0.5	+0.4	+0.3	+0.3	+0.3
Net exports	+0.5	+0.2	+0.1	+0.0	+0.2	+0.0	+0.1	+0.1	+0.0	+0.1	+0.0	+0.0	+0.0	+0.0	+0.0
Changes in inventories	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
<b>Labor market</b>															
<i>% of labor supply</i>															
Unemployment rate (Eurostat definition)	5.7	5.7	5.5	5.5	5.8	5.7	5.7	5.7	5.7	5.6	5.6	5.5	5.5	5.5	5.5
<i>Annual and/or quarterly changes in %</i>															
Total employment	+0.7	+1.0	+1.0	+0.3	+0.1	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.2	+0.2	+0.2	+0.2
of which: private sector	+0.9	+1.2	+1.2	+0.4	+0.1	+0.2	+0.2	+0.3	+0.4	+0.3	+0.3	+0.3	+0.3	+0.3	+0.2
Payroll employment	+0.8	+1.1	+1.0	+0.5	-0.3	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.2	+0.2	+0.2	+0.2
<i>Additional variables</i>															
<i>Annual and/or quarterly changes in % (real)</i>															
Real disposable household income	+1.8	+2.8	+1.6	-0.4	+0.8	+0.3	+0.6	+0.6	+1.0	+0.8	+0.8	+0.4	+0.0	-0.1	-0.3
<i>% of real GDP</i>															
Output gap	-0.8	-0.1	0.4	-1.0	-0.9	-0.8	-0.7	-0.5	-0.3	0.0	0.2	0.4	0.4	0.5	0.5

Source: OeNB June 2015 outlook. Quarterly figures adjusted for seasonal and working-day variations.

Note: Deemed to be too high, the Q1 15 growth rate of payroll employment (national accounts definition) was revised down in the second quarter of 2015.

Table 20

### Comparison of current economic forecasts for Austria

	OeNB			WIFO		IHS		OECD		IMF		European Commission	
	June 2015			March 2015		March 2015		June 2015		April 2015		May 2015	
	2015	2016	2017	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
<b>Key results</b>	<i>Annual change in %</i>												
GDP (real)	+0.7	+1.9	+1.8	+0.5	+1.3	+0.8	+1.6	+0.6	+1.7	+0.9	+1.6	+0.8	+1.5
Private consumption (real)	+0.7	+1.8	+1.6	+0.4	+0.9	+0.9	+0.9	+0.8	+1.8	x	x	+0.6	+1.0
Government consumption (real)	+0.9	+0.9	+1.1	+1.1	+1.0	+0.5	+0.5	+1.0	-0.6	x	x	+1.1	+0.6
Gross fixed capital formation (real)	-1.9	+1.7	+2.6	+1.0	+1.5	+1.0	+2.7	-1.9	+2.5	x	x	+0.9	+3.2
Exports (real)	+2.8	+4.8	+4.8	+2.0	+3.2	+3.4	+5.1	+3.3	+5.9	+2.7	+5.1	+2.1	+3.9
Imports (real)	+2.0	+4.7	+5.1	+2.3	+3.4	+3.8	+5.0	+4.2	+5.4	+2.7	+5.1	+2.1	+4.0
GDP per employee <sup>1</sup>	+0.0	+0.9	+0.8	+0.6	+1.2	+0.0	+0.5	+0.2	+0.8	x	x	+0.2	+0.6
GDP deflator	+1.3	+1.8	+1.9	+1.4	+1.5	+1.2	+1.7	+1.1	+1.5	+1.3	+1.5	+0.9	+1.6
CPI	x	x	x	+1.3	+1.5	+1.2	+1.8	x	x	x	x	x	x
HICP	+0.9	+1.9	+2.0	+1.2	+1.5	+1.1	+1.8	+0.6	+1.6	+1.1	+1.5	+0.8	+1.9
Unit labor costs	+1.9	+1.2	+1.5	+1.8	+1.4	+1.8	+1.5	+0.7	+0.0	x	x	+1.3	+0.7
Payroll employment	+0.7	+1.0	+1.0	+0.5	+0.7	+0.8	+1.1	+0.4	+1.0	+0.5	+0.7	+0.6	+0.8
	<i>% of labor supply</i>												
Unemployment rate <sup>2</sup>	5.7	5.7	5.5	x	x	x	x	+5.8	+5.7	x	x	+5.8	+5.7
	<i>% of nominal GDP</i>												
Leistungsbilanz	1.3	2.1	2.8	1.4	1.0	x	x	+0.9	+1.4	1.9	1.8	2.4	2.4
Current account (Maastricht definition)	-1.8	-1.8	-1.4	-2.2	-1.9	-2.1	-1.8	-2.3	-2.1	-1.7	-1.7	-2.0	-2.0
<b>External assumptions</b>													
Oil price in USD/barrel (Brent)	63.8	71.0	73.1	70.0	80.0	65.0	68.0	65.0	65.0	58.1	65.7	59.4	66.0
Short-term interest rate in %	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
USD/EUR exchange rate	1.12	1.12	1.12	1.15	1.15	1.14	1.14	1.12	1.12	1.13	1.13	1.08	1.07
	<i>Annual change in %</i>												
Euro area GDP (real)	+1.5	+1.9	+2.0	+1.1	+1.3	+1.2	+1.5	+1.4	+2.1	+1.5	+1.6	+1.5	+1.9
U.S. GDP (real)	+2.6	+3.1	+2.7	+2.9	+2.8	+2.9	+2.8	+2.0	+2.8	+3.1	+3.1	+3.1	+3.0
World GDP (real)	+3.2	+3.8	+3.8	+3.7	+3.7	x	x	+3.1	+3.8	+3.5	+3.8	+3.5	+3.9
World trade	+2.6	+5.0	+5.3	+4.1	+4.2	+4.3	+5.5	+3.9	+5.3	+3.7	+4.7	+3.8	+5.1

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

<sup>1</sup> Excluding WIFO: productivity per hour.

<sup>2</sup> Following the backward revision of the Austrian microcensus labor force survey data and the resulting shift in the unemployment rate levels in March 2015, the WIFO, IHS and IMF unemployment rate forecasts are no longer comparable.

# Financial literacy gaps of the Austrian population

*Most people lack financial knowledge and have trouble dealing competently with their financial affairs, as evidenced by recent empirical research on financial literacy in various countries. We investigate financial literacy among Austrians based on a novel dataset covering about 2,000 persons. Our findings corroborate the existence of substantial knowledge gaps, which are most conspicuous among respondents with low educational attainment and low incomes, among younger and older people as well as women. We provide tentative evidence for a positive link between financial knowledge scores and financial behavior, such as setting aside rainy day funds or using several sources of information when choosing financial products.*

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*Keywords: financial literacy, financial education, central banks*

Over the last years, numerous empirical studies, including large-scale and international ones, have consistently shown that a considerable share of the population has substantial knowledge gaps in basic financial concepts, such as interest rates or inflation (Atkinson and Messy, 2012). At the same time, financial products and economic relationships have become ever more complex over the past decades, requiring a higher level of financial knowledge.

In this paper, we investigate the level of financial literacy of the Austrian population as well as the relationship between financial knowledge and sound financial behavior. Our analysis is based on a new quantitative dataset resulting from a survey of about 2,000 Austrian individuals. This survey was part of an OECD initiative to collect comparable data on financial literacy for a broad set of countries (OECD, 2013). In line with the OECD's definition of financial literacy, the dataset therefore covers information on financial knowledge, attitudes and behavior.

The paper is structured as follows: Section 1 defines financial literacy and

financial knowledge and gives an overview of findings of previous empirical research. Section 2 describes the new Austrian dataset and analyzes the determinants of financial knowledge. Section 3 deals with respondents' self-assessment of their financial knowledge. Section 4 links financial knowledge to a set of behavior patterns and section 5 concludes.

## 1 Financial literacy and financial knowledge: definitions and empirical findings

As with many other complex terms and concepts, there is no single generally accepted definition of financial literacy. Researchers and organizations have defined financial literacy in many different ways (Hung et al., 2009; Holzmann, 2010). We apply the rather broad definition used by the Organisation for Economic Co-operation and Development (OECD) and its International Network on Financial Education (INFE), which integrates financial knowledge, skills, attitudes and behavior, as well as their mutual relationships: Financial literacy is defined as “a combination of

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financial awareness, knowledge, skills, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing” (Atkinson and Messy, 2012).

Let us turn to some of the elements used in the OECD’s definition. Financial knowledge relates to the possession of know-how and understanding in particular of one’s personal financial matters and of important everyday financial concepts. It thus refers to a rather basic form of financial literacy. Furthermore, actual financial knowledge also influences the way people themselves assess their understanding of finance matters, i.e. perceived financial knowledge, as well as their financial skills (Hung et al., 2009). People’s actions, i.e. their financial behavior, in turn, depend on all three elements (actual knowledge, perceived knowledge, and skills). Finally, the experience people gain through financial behavior feeds back to both their actual and perceived financial knowledge. Still, the relationships are likely to be imperfect, as each of these elements also depends on other factors internal and external to the individual, such as attitudes or resources.

Even the most comprehensive definition of financial literacy leaves several crucial questions unsolved: How are the different elements of financial literacy interrelated? Which elements contribute most to effective decision making? Is financial literacy a construct of its own and in which way does it differ from reading skills and numeracy (Sälzer and Prenzel, 2014)? Is there a clear distinction between financial literacy and the broader concept of economic literacy (Retzmann et al., 2010; Retzmann and Frühauf, 2014)?

Despite this ongoing discussion within the scientific community, most studies on financial literacy have focused

on measuring financial knowledge of individual persons. By contrast, values, attitudes and behavior as well as a broader perspective on critical economic thinking have played a comparatively minor role.

In our research, we adopt the OECD approach to measuring financial literacy (Atkinson and Messy, 2012) and include not only financial knowledge, but also financial behavior and attitudes as highly relevant elements of financial literacy. This decision is based on research showing a relationship between people’s attitudes toward money and the extent to which they face financial problems (Barry, 2014), as well as between their money attitudes and level of satisfaction with their financial situation (Shim et al., 2009).

The empirical financial literacy research can be classified into three broad categories: One strand of literature deals with the design and use of methods to assess financial knowledge (e.g. Knoll and Houts, 2012). Nowadays, most studies use survey techniques based on questionnaires asking respondents various knowledge questions, with both open and multiple choice answers. Some of the questions have become well established and have been used in several countries around the world, providing international benchmarks (Lusardi and Mitchell, 2011a and 2011b; Atkinson and Messy, 2012). Nevertheless, the validity of these items is doubtful: they possibly cover knowledge that is not necessarily indicative of a respondent’s capability to take sound financial decisions. For instance, a person’s ability to properly calculate interest rates may not reveal much about his or her success in dealing with financial decisions and products (Greimel-Fuhrmann, 2014).

A second strand of literature investigates the personal characteristics that

influence financial knowledge (see e.g. Atkinson and Messy, 2012). Lusardi and Mitchell (2014) summarize the existing empirical literature. The surveyed studies consistently identify important knowledge gaps, especially in more sophisticated financial topics, such as real interest, compound interest or the effect of exchange rate changes. They moreover show that financial knowledge correlates with socio-demographic characteristics: knowledge increases with education level and income. Men tend to achieve higher scores in financial knowledge tests than women. This gender gap remains even after correcting for differences in education, profession or income and may be partly explained by women's different response behavior in survey tests. Studies examining whether this gender gap is ascribable to couples' division of financial responsibilities, proxied by marital status and budget responsibility, have yielded rather inconclusive results.

Respondents with a migration background tend to show relatively weak test results. The link between age and knowledge appears to be U-shaped, with younger and older participants performing particularly poorly. In the case of younger respondents, this may be due to missing or scant experience of work life and in financial markets. The elderly, on the other hand, may not be familiar with new financial products and/or lack the skills and technological tools necessary to understand them. Respondents from large cities tend to attain better scores than respondents from rural areas.

The third main strand of literature investigates the link between financial

knowledge and behavior. Atkinson and Messy (2012) for example find that respondents with greater financial knowledge show more competent behavior. According to Gerardi et al. (2010), limited financial literacy was one of the drivers of mortgage delinquency and default in the U.S. subprime mortgage market. Lusardi and Tufano (2009) confirm that the least financially savvy use high-cost borrowing and pay higher fees. Brown and Graf (2013) show that financial literacy is positively related to retirement planning in Switzerland. Klapper et al. (2013) point out that Russians with elevated financial literacy participate more actively in formal financial markets and are more likely to have unspent income left, which enables them to better deal with macroeconomic shocks. Beckmann and Stix (2015) find that a majority of respondents is aware that depreciations increase loan installments and that knowledge about exchange rate risk greatly impacts on the choice of the loan currency.

Few papers describe field experiments corroborating the effectiveness of financial training measures. Lührmann et al. (2012) for example show that financial training increases not only German teenagers' actual financial knowledge, but also their interest in financial matters as well as their self-assessed knowledge. They are moreover less prone to make impulse purchases and are better at identifying the riskiness of assets.

## 2 A novel dataset on Austrians' financial knowledge

The financial literacy survey this article focuses on was carried out among about

2,000 individuals in Austria aged 15 and above in the fall of 2014.<sup>2</sup> It consisted of face-to-face interviews covering questions on financial knowledge, several aspects of financial behavior and attitudes as well as a rich set of socio-demographic variables. The survey was part of an initiative of the OECD's INFE working group to run a unified and extended survey on financial literacy, behavior and attitudes in a wide range of countries. A pilot study had already been conducted in 14 countries in 2010 and 2011, in which Austria had not participated, however.

The questions of the OECD survey were based on previous international research and were designed to be of relevance for people from very different backgrounds in a wide range of countries (Atkinson and Messy, 2012). The questionnaire consisted of open and

multiple choice questions. In addition to the full set of mandatory question and a wide choice of optional items (OECD, 2013), the Austrian survey<sup>3</sup> also included some supplementary questions that we considered to be of special relevance in the Austrian context. For details on the socio-demographic distribution of the sample, see table A1 in the annex.

## 2.1 Survey identifies important knowledge gaps

In the survey, 11 questions covered various aspects of financial knowledge. They test the understanding of basic and more sophisticated economic and financial concepts, such as inflation, interest rates, the risk-return link and exchange rates. None of the questions required expert knowledge. Box 1 shows the 11 questions in detail.<sup>4</sup>

Box 1

### Questions on financial knowledge in the survey

The survey of financial literacy covers 11 questions on financial knowledge, which we classified – for later use – into basic questions (“B”) and sophisticated questions (“S”). The split follows intuition, but is also supported by the share of correct answers shown in chart 2. The correct answers are given in bold at the end of each question.

**B “Division”:** Imagine that five brothers are given a gift of EUR 1,000. If the brothers have to share the money equally, how much does each one get? **(EUR 200)**

**S “Inflation”:** Now imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays at 2%. In one year's time, will they be able to buy (a) more with their share of the money than they could today, (b) as much as today, (c) or less than they could buy today? **(c)**<sup>1</sup>

**S “Real interest rate”:** Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year: After one year, how much would you be able to buy with the money in this account? (a) More than today, (b) exactly the same, (c) less than today. **(c)**

<sup>1</sup> If respondents came up with the alternative answer “It depends on the types of things they want to buy” (not part of the set of options), this answer was counted as correct.

<sup>2</sup> The survey comprised 1,994 computer-assisted personal interviews (CAPIs) from October to November, 2014. The non-response rate was about 30%. If not indicated differently, we use survey weights to produce descriptive population statistics throughout the paper. The weights consist of a combination of sampling/design weights and poststratification weights based on external population statistics on age and gender at the province level.

<sup>3</sup> The full questionnaire is available from the authors upon request.

<sup>4</sup> While most of these survey questions have been repeatedly used in research and are thus especially suited for international comparison, they share a general validity caveat: Is the ability to perform simple calculations and understand basic concepts, such as interest or inflation, really the relevant prerequisite for responsible and sound financial behavior? Or are general attributes, e.g. being a well-organized and forward-looking person, or interest in financial issues more relevant for financial success?

**B “Zero interest”:** You lend EUR 25 to a friend one evening and he gives you EUR 25 back the next day. How much interest has he paid on this loan? **(0)**

**S “Interest after 1 year”:** Suppose you put EUR 100 into a no-fee savings account with a guaranteed interest rate of 2% per year. You do not make any further payments into this account and you do not withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made? **(102 EUR)**

**S “Interest after 5 years”:** And how much would be in the account at the end of five years? (a) More than EUR 110, (b) exactly EUR 110, (c) less than EUR 110, (d) It is impossible to tell from the information given. **(a)**

**S “Exchange rate”:** Suppose you have taken out a loan in Swiss francs. Then the exchange rate of the euro depreciates against the Swiss franc. What happens to the euro amount you owe? (a) It increases, (b) it stays exactly the same, (c) it decreases. **(a)**

**S “Interest – bond”:** If interest rates rise, what will typically happen to bond prices? (a) They will rise, (b) they will fall, (c) they will stay the same, (d) there is no relationship between bond prices and the interest rate. **(b)**

**B “Risk – return”:** Is the following statement (a) true or (b) false? An investment with a high return is likely to be high risk. **(a)**

**B “Cost of living”:** Is the following statement (a) true or (b) false? High inflation means that the cost of living is increasing rapidly. **(a)**

**S “Risk diversification”:** Is the following statement (a) true or (b) false? It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares. **(a)**

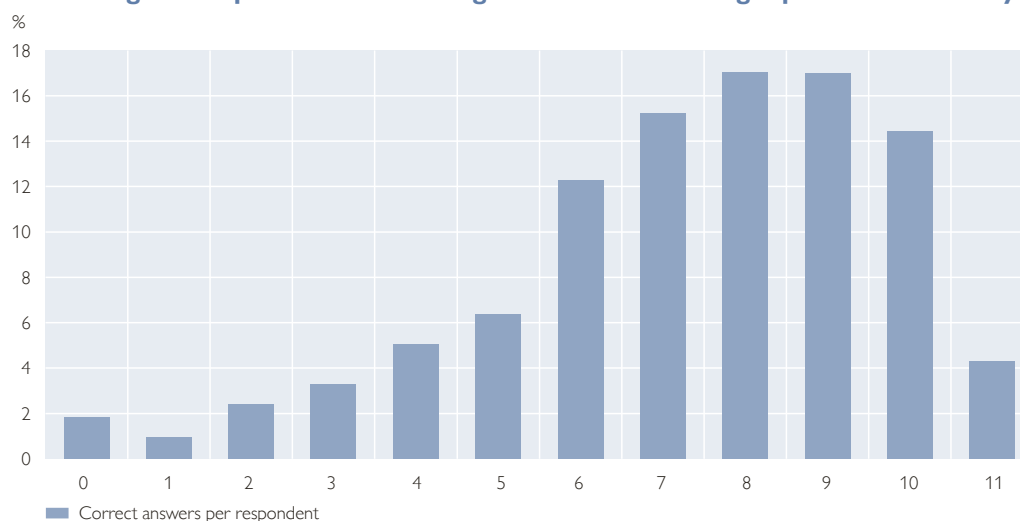
Chart 1 shows that 4% of the respondents answered all 11 questions correctly and a total of 36% were able to give the correct answer to at least 9 questions. Furthermore, about 11% of the respondents answered at least

5 questions incorrectly (not including “don’t know” answers).

Taking a closer look at the responses to the 11 knowledge questions, we find comparatively low levels of financial knowledge for some of the questions.

Chart 1

### Percentage of respondents answering x financial knowledge questions correctly

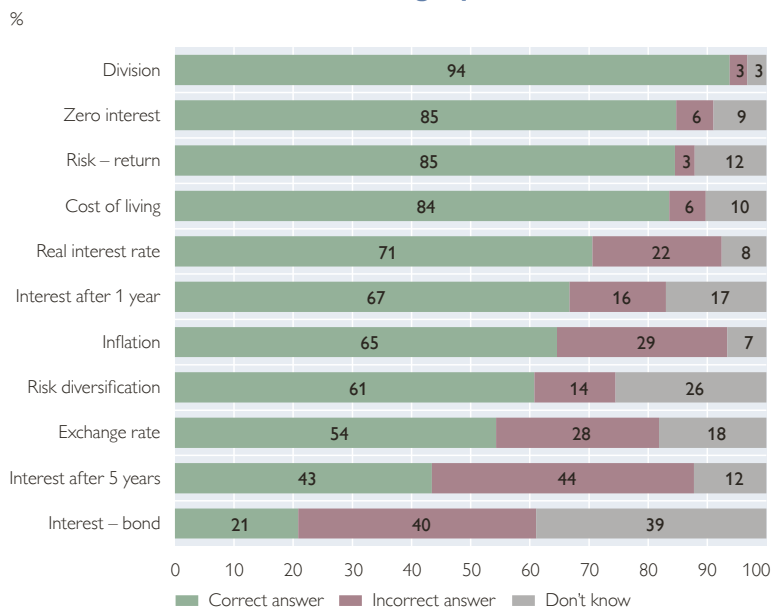


Source: OeNB.

Note: N = 1,994. The bars add up to 100%.

Chart 2

## Answers to 11 financial knowledge questions



Source: OeNB.

Note: N = 1,994.

Very basic questions that require an understanding of division, interest rates, risk diversification or inflation were answered correctly by a vast majority of respondents. The portion of correct answers exceeded 80% and the net number of correct answers (i.e. correct minus false answers) was also high. For example, 94% of the respondents managed to correctly divide 1,000 by five (“Division”). 85% of them knew that the interest rate is zero when you lend someone EUR 25 and get back the same amount the next day (“Zero interest”). The same fraction understood that higher return is usually associated with higher risk (“Risk – return”). And 84% of the respondents understood the concept of inflation (“Cost of living”).

However, with slightly more complex questions, we observe that the number of correct responses declined

markedly, to well below 80%. Also, the number of wrong answers increased sharply, and more people stated that they did not know the answer:

- The concept of real interest rates, i.e. interest minus inflation, was understood by 71% of the respondents, while 22% failed this question (“Real interest rate”).
- 67% correctly answered the question about the amount of money you are left with after setting EUR 100 aside for one year in an account with an interest rate of 2% (“Interest after 1 year”).
- 65% of the respondents understood that inflation implies that over time one can buy less with a fixed amount of money (“Inflation”).
- 61% of the respondents understood that investment risk can be reduced by buying a wide range of stocks and shares (“Risk diversification”).
- 54% of the respondents understood the effect of exchange rate fluctuations on a foreign currency loan (“Exchange rate”). Note that this share increases to 89% if we only consider those 22 respondents that indicated that they have a foreign currency loan.

For questions with an even more advanced level of sophistication, the net correct answers, i.e. the number of correct answers minus the number of false responses, is actually negative: 43% of the respondents grasped the concept of compound interest, i.e. the fact that leaving an amount of money in your account for five years usually gives you interest not only on the principal, but also on the interest gained in the past. At the same time, 44% failed on that question (“Interest after 5 years”).<sup>5</sup>

<sup>5</sup> The exact wording of the question on “Interest after 5 years,” taken from the OECD questionnaire, does not unambiguously specify that annual interest payments are credited to the same account. Yet, it is not uncommon that interest is credited to a different account. Hence, we cannot rule out that this has biased the results.



The question on the link between interest rates and bond prices produced even fewer correct answers (21%), while 40% failed (“Interest – bond”). Furthermore, the number of respondents who said that they did not know the answer was as high as 39%, which may in part have been due to their unfamiliarity with the term bond. If we only consider the bondholders among the respondents, the fraction knowing the correct answer increases to 41% (as compared to 21% for the entire sample).

Overall, this first evaluation shows that there are remarkable knowledge gaps as regards most of the questions. While the majority of respondents are familiar with basic concepts such as interest rates or inflation, other important concepts such as real interest, compound interest, the link between interest rates and bond prices or the effect of exchange rate fluctuations on foreign currency loans are not understood by at least one-quarter of the population. This is a source of concern, given that most Austrians are – either directly or indirectly – consumers of financial products that involve these concepts.

Table 1 compares the results of our survey and of the OECD pilot study (Atkinson and Messy, 2012) for the eight survey questions that were used in both questionnaires.<sup>6</sup> Austrian respondents appear to have relatively good financial knowledge in comparison with the respondents (mean) from the 14 countries that participated in the OECD pilot study. 67% of the Austrian respondents answered six of the eight questions correctly compared with 51% in the OECD sample average. Besides, the average number of correctly answered questions is 73% in Austria,

Table 1  
**Comparison of Austrian data with data from other OECD countries<sup>1</sup>**

	Mean of correct answers to the 8 knowledge questions	Correct answers to 6 or more questions
	%	
Austria	73	67
OECD sample average <sup>2</sup>	66	51
Germany	71	58
United Kingdom	69	53
Norway <sup>3</sup>	59	40
Hungary	77	69

Source: OECD, authors' calculations.

<sup>1</sup> See Atkinson and Messy (2012).

<sup>2</sup> The 14 countries participating in the OECD pilot study were: Albania, Armenia, Czech Republic, Estonia, Germany, Hungary, Ireland, Malaysia, Norway, Peru, Poland, South Africa, United Kingdom, British Virgin Islands.

<sup>3</sup> Norway reformulated the questions slightly.

versus 66% in the OECD sample average. However, these results should be interpreted against the background of the selection of countries surveyed by the OECD: most of them are less developed than Austria. When comparing the Austrian survey results with countries of a similar level of economic development, we find that the results are more mixed: Austria's score, for instance, broadly matches the German results of the pilot study, but is outperformed by Hungary.

## 2.2 The impact of socio-demographic characteristics on financial knowledge

The new dataset clearly points to knowledge gaps among the Austrian population. These vary, however, substantially among different socio-demographic groups. Overall, we are able to confirm many of the empirical findings summarized by Lusardi and Mitchell (2014). We use the question on interest after one year for a detailed breakdown of respondents' scores based on socio-demographic criteria. Chart 3, hence,

<sup>6</sup> Questions 1, 2, 4, 5, 6, 9, 10 and 11 listed in box 1.

reveals that men score better than women and that the level of education and income appears to be of high relevance for scores. More specifically, 83% of university or college graduates know the correct answer to the question, while the fraction is as low as 46% for those having only completed compulsory education. In this subgroup, the share of respondents who do not know the answer is high, too (34%). The respective charts for the ten other knowledge questions broadly confirm this picture.

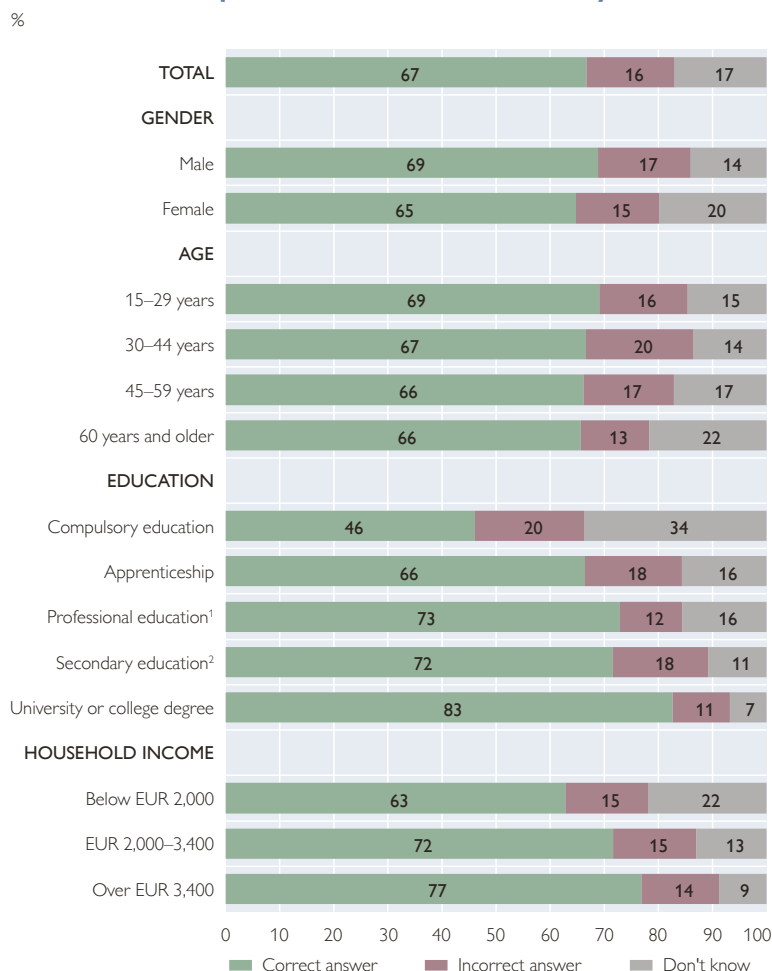
To assess whether these differences are statistically significant while holding other variables constant, we construct a financial knowledge score by counting the number of correct responses of each respondent, following Atkinson and Messy’s approach (2012). We then regress this knowledge score (as dependent variable) on the following independent variables: a dummy for gender; age and age squared (testing the U-shaped link suggested by the literature); dummies for low education, medium/vocational education and general/high education; dummies for the income level (low/medium/high); a dummy for the employment status (employed full time/unemployed/not working/employed part time/self-employed); and a dummy for town size (small/medium/large = Vienna).

The regression results are shown in table 2. The asterisks indicate the level of statistical significance. The first three columns use different subsets of the 11 questions: The first column shows the regression results when the dependent variable is the number of correct answers to the total set of 11 knowledge questions presented in box 1. The second column focuses exclusively on the correct answers to the four most basic questions, namely the first four questions in chart 2 or those indicated with a “B” in box 1. The dependent variable in the third column is the number of correct answers to the seven more sophisticated knowledge questions, marked with an “S” in box 1. The coefficients in most rows need to be interpreted against a benchmark, which is shown in italics. For example, a positive coefficient for males indicates that test scores of men are higher than those of the benchmark “female.”

Overall, the results are largely in line with the findings of previous empirical research. Men achieve scores

Chart 3

Answers to the question on interest after one year



Source: OeNB.

<sup>1</sup> Technical, commercial or vocational education not qualifying for university.

<sup>2</sup> General or vocational secondary education qualifying for university.

Note: N = 1,994.

that are significantly higher than those of women, as was the case in almost all of the 14 countries of the OECD pilot study (Atkinson and Messy, 2012). As we control for a comprehensive set of socio-demographic characteristics, this difference cannot be attributed to gender differences in education, income or labor force status. Furthermore, an alternative regression (not shown here) using the number of incorrect answers as dependent variable likewise indicates that men outperform women. In other words, men show a lower likelihood of giving an incorrect answer. By contrast, women admit significantly more often than men that they do not know the answer. Overall, we find that women are less likely to answer the financial knowledge ques-

tions correctly and that they are more likely to answer them incorrectly or with “don’t know.” This gender gap is subject to future investigation in Greimel-Fuhrmann et al. (2015a).

Our study also confirms the non-linear shape of the link between knowledge and age, which indicates that the youngest and the oldest respondents perform worst. Knowledge scores are maximized at an age of 51. The effect of the highest educational attainment on knowledge is also highly significant. Respondents who have (at most) only finished compulsory education score significantly worse than those having completed medium-level vocational education. Graduates from general higher schools (including tertiary education), by contrast, perform significantly better

Table 2

### OLS regression on financial literacy

	All 11 questions	Basic questions	Sophisticated questions	Self-assessment
Male	0.49***	0.10*	0.40***	0.06
<i>Female</i>				
Age	0.06***	0.03***	0.04**	0.02**
Age squared	-0.00***	-0.00**	-0.00**	-0.00*
Education – low <sup>1</sup>	-0.99***	-0.38***	-0.60***	-0.41***
<i>Education – vocational training<sup>2</sup></i>				
Education – high <sup>3</sup>	0.68***	0.18***	0.51***	0.22***
Income below EUR 2,000	-0.32**	-0.07	-0.25**	-0.19***
<i>Income EUR 2,000–3,400</i>				
Income over EUR 3,400	0.19	0.03	0.17	0.20**
<i>Employed (more than 35 hours per week)</i>				
Unemployed	0.26	0.02	0.24	0.06
Not working	0.27	-0.03	0.30*	-0.04
Employed part time (max. 35 hours per week)	0.12	0.02	0.10	0.11
Self-employed	0.43*	0.09	0.34*	0.12
Town size (up to 5,000 inhabitants)	-0.13	0.15**	-0.29**	0.06
Town size (5,000 to 1 million inhabitants)	0.13	0.24***	-0.11	-0.12
<i>Town size (Vienna)</i>				
Constant	5.65***	2.71***	2.95***	-0.26
N	1994	1994	1994	1994
R <sup>2</sup>	0.11	0.08	0.10	0.09

Source: Authors' calculations.

<sup>1</sup> At most completed compulsory education.

<sup>2</sup> Apprenticeship; technical, commercial or vocational education not qualifying for university.

<sup>3</sup> Secondary academic or vocational education qualifying for university education; other education qualifying for university education; university of applied sciences; technical or vocational college; university: bachelor's, master's and doctoral degrees.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note: Variables in italics are benchmarks for dummy variables. The regression is based on unweighted survey data.

than the intermediate benchmark group. This result suggests that the payoff of offering financial education measures to those with the lowest education levels is likely to be especially high.

There is furthermore some evidence that lowest-income respondents perform worse than those with medium or high income. The former may have less flexibility to “learn by doing” as they cannot afford to make mistakes (Atkinson and Messy, 2012). There is no significant difference between medium- and high-income earners. The employment status is not significant throughout all regressions with the exception of self-employment, which appears to be associated with higher financial knowledge.

The evidence on the town size for the entire set of 11 questions is insignificant. However, when we split the set into basic and more sophisticated questions, we find that respondents from Vienna outperform those from smaller towns or rural areas in the more sophisticated questions. By contrast, the former perform worse in the more basic questions.

Throughout all regression models, the value of  $R^2$  is rather low. This means that we can only explain about 10% of the variation in financial knowledge scores by the socio-demographic variables that we use. This is a common feature of microdata studies on financial knowledge (see e.g. Brown and Graf, 2013; Bucher-Koenen and Lamla, 2014; Fonseca et al., 2014).<sup>7</sup> It is not the purpose of our model to predict literacy scores, however. Instead, we aim at identifying the least knowledgeable portions of the population to be able

to target them especially via new tailor-made financial education measures.

### 3 Respondents’ self-assessment of financial knowledge

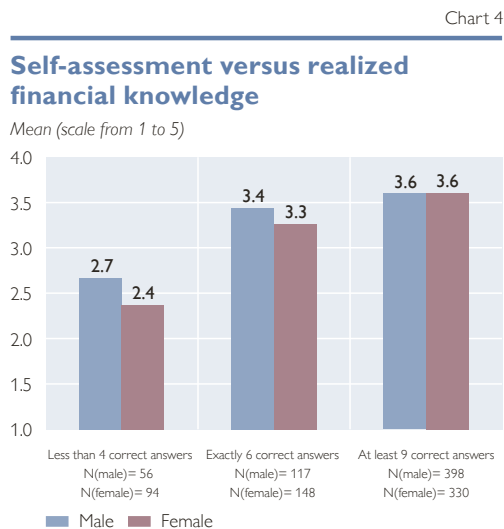
The level of self-confidence in financial matters may shape financial behavior, and also how confidently people answer knowledge questions, thus avoiding the “don’t know” option. In our survey, we explicitly ask people to self-assess their knowledge:

**“Self-assessment”:** *How would you rate your level of financial knowledge on a scale of 1 to 5? (1 = not at all knowledgeable, 5 = very knowledgeable).*

The answers to this question reveal that respondents are broadly aware of existing knowledge gaps. The average self-assessment is 3.3, which is only a little higher than the “neutral” value 3. The mean for men is slightly higher than that for women (3.31 versus 3.21). At the same time, the self-assessment scores also increase with the financial knowledge measure, as also found by Van Rooij et al. (2011). This correlation may be the result of causality that runs both ways, as higher knowledge can be assumed to support self-confidence in one’s own financial capabilities, while self-confidence, in turn, may give respondents the courage to answer difficult questions instead of refusing, which potentially raises the test score. Overall, women appear to have a more realistic perception of their own financial capabilities, as indicated by the higher correlation coefficient compared with men (0.32 versus 0.28).

Chart 4 confirms the positive relationship between perceived financial

<sup>7</sup> We experimented with several additional explanatory variables that are common in the literature, such as migration background, marital status or a proxy for the risk aversion of the respondent. The coefficients are, however, not significant, while the major results remain unchanged.



Source: OeNB.

knowledge and realized knowledge scores. In this chart, we juxtapose the average self-assessment of respondents with the lowest level of financial literacy (defined here as less than 4 correct answers), those with the highest knowledge score (at least 9 correct answers) and those with exactly 6 correct answers, always differentiating between men and women.

However, in line with the findings presented by Lusardi and Mitchell (2014), we can also see from chart 4 that respondents with low financial knowledge overestimated their literacy, which was more pronounced in the case of men: Respondents who were not able to answer more than three questions correctly still showed a rather elevated self-assessment, with an average score of 2.7 (men) and 2.4 (women), only slightly below the neutral value 3.<sup>8</sup> Unrealistic perceptions of one's financial knowledge may motivate people to choose complex products such as foreign currency loans or repayment vehicles without properly understanding their properties and risks.

Column 4 in table 2 shows that perceived financial knowledge depends on roughly the same variables as the knowledge score itself: People with higher educational attainment not only have greater financial knowledge but are also very much aware of this. Vice versa, lower-income groups also have a lower level of self-confidence in financial matters. We also observe similar age effects. Most interestingly, however, the gender gap disappears when it comes to the self-assessment; the coefficient is no longer significant. Further research would be needed to understand this absence of a gender gap.

#### 4 The link between financial knowledge and financial behavior

Financial education measures usually rely on the assumption that people with a higher level of financial knowledge take better investment and financing decisions. Investigating the relationship between knowledge and behavior via regression analysis is complicated given the possibility of reverse causalities, which could potentially introduce an endogeneity bias into regression analyses. For example, we may find it desirable that people carefully check several options before taking financial decisions. A higher level of financial knowledge may indeed induce people to compare more financial products and to consider a variety of sources of information before arriving at a decision. On the other hand, the process of comparing products and using information may in turn contribute to financial knowledge.

A thorough analysis of the link between financial knowledge and behavior would be beyond the scope of this

<sup>8</sup> Note that in the survey the question on self-assessment was asked before the 11 knowledge questions. Respondents thus assessed their knowledge before answering the test questions.

paper and is subject to a special investigation in Greimel-Fuhrmann et al. (2015b).<sup>9</sup> In charts 5 and 6, we nevertheless show tentative evidence corroborating that greater financial knowledge may indeed have an impact on financial behavior. Our survey questionnaire includes several questions that may be used to assess whether

respondents show sound financial behavior. The full list of questions is shown in box 2. This list includes questions on how people select financial products, whether they put enough money aside for tough economic times and retirement, and whether they take out a loan for economically sound reasons.

Box 2

### Questions on financial behavior

The survey includes six questions that we use to investigate financial behavior. At the end of each question we define what we consider to be positive financial behavior, i.e. behavior that reflects well-thought-out decisions on financial products and keeps people from falling into debt traps in difficult economic circumstances.

**“Knows many financial products”:** Can you tell me whether you have heard of any of these types of financial products? (a) Current account, (b) savings book, (c) building loan contract, (d) personal pension fund, (e) investment fund, (f) stocks and shares, (g) bonds, (h) financial derivatives, (i) insurance policies, (j) mobile phone payment account, (k) prepaid payment card, (l) microfinancing/crowd financing **(Positive: knows several financial products, measure: number of financial products known)**

**“Pension funds”:** Do you currently hold a personal pension fund? **(Positive: yes, measure: dummy = 1 if yes, 0 otherwise)**

**“Shopping around”:** Which of the following statements best describes how you last chose a product? (a) I considered several products from different companies before making my decision, (b) I considered the various products from one company, (c) I didn’t consider any other products at all, (d) I looked around but there were no other products to consider. **(Positive: considers other products, measure: dummy = 1 if (a), (b) or (d), 0 otherwise)**

**“Sources of information”:** Which of the following sources of information had the greatest influence on your most recent financial product choice? (a) Unsolicited information sent through the mail, (b) Information picked up in a branch, (c) Product-specific information found on the Internet, (d) Information from sales staff of the firm providing the products, (e) Best-buy tables in financial pages of newspapers/magazines, (f) Best-buy information found on the Internet, (g) Specialist magazines/publications, (h) Recommendation from independent financial adviser or broker, (i) Advice from friends/relatives not working in the financial services industry, (j) Advice from friends/relatives working in the financial services industry, (k) Employer’s advice, (l) Newspaper articles, (m) Television or radio programs, (n) Newspaper advertisements, (o) Television advertisements, (p) Other advertising, (q) Own experience, (r) Other source **(Positive: uses various sources of information, measure: number of sources of information used)**

**“Reason for taking out a loan”:** Have you personally used credit (e.g. loan, leasing, installments or overdraft) in the past 12 months for any of the following purposes and paid interest on the balance? (a) To pay regular bills, (b) For everyday spending, (c) To help support family or friends outside your immediate household, (d) To buy something on impulse, (e) To buy a gift for someone, (f) To buy a house or pay for renovation, (g) To pay for holidays, (h) To

<sup>9</sup> To our knowledge only a few studies try to solve this endogeneity problem via instrumental variable estimation. Lusardi and Mitchell (2014) conclude that the link between financial knowledge and behavior tends to get stronger if instruments are used, implying that the noninstrumented estimates underestimate the true effect.

buy a car, (i) To pay for education or training (for you or a family member), (j) To invest in your business or in the business of a family member, (k) For financial investment (**Negative: (a), (b), (c), (d), (e), (g), (k), measure: number of negative reasons for taking a loan**)

**“Rainy day funds”:** If you lost your main source of income, how long could you continue to cover living expenses, without borrowing any money or moving house? (a) Less than a week, (b) At least a week, but not one month, (c) At least one month, but not three months, (d) At least three months, but not six months, (e) More than six months (**Positive: has at least three months of funds set aside, measure: dummy = 1 if (d) or (e), 0 otherwise**)

Charts 5 and 6 link the various proxies for financial behavior to the number of correctly answered knowledge questions. Chart 5 shows that the number of financial products a person knows increases with financial knowledge. Those who answer 11 questions correctly know on average 10 different financial products, while those with low knowledge have heard of only about six products. Similarly, those with the highest knowledge score also consider on average two different sources of information when selecting a financial product. Those with the lowest literacy, in contrast, rely on just one source. Knowing and considering a variety of different products and sources can be assumed to lead to more informed financial decisions. Chart 5 also shows that people with greater knowledge

have a lower tendency to take out a loan for short-term purposes (e.g. buying gifts, everyday spending or impulse purchases or financing holidays) or for risky purposes (e.g. supporting friends or financing financial investment). Relying on credit to fund basic day-to-day purchases or risky investment may be the starting point of a debt trap. About two-thirds of all respondents did not – or would not – take out a loan for any such short-term or risky purpose. Those with the lowest knowledge scores (less than 6 correct answers) listed on average more than one adverse loan motivation. This number declines to 0.5 for those who answered 10 or 11 questions correctly.

Chart 6 links the number of correct answers to the share of respondents indicating that they have a voluntary per-

Chart 5

### Financial behavior indicators: number of ...



Source: OeNB.

Chart 6

**Financial behavior indicators: share of respondents who state they ...**

Source: OeNB.

sonal pension fund and rainy day funds of at least three months of living expenses and who compare alternative offers before choosing a financial product. The evidence is less clear here. People with higher knowledge have more rainy day funds: among those with the lowest literacy scores, around 40% say they have sufficient funds set aside to cover living expenses for at least three months; this fraction is as high as 65% for those with top scores. When we factor out those with the lowest knowledge scores – subgroups where we only have a couple of dozens of respondents (see chart 1) –, there also appears to be a positive link between literacy and the pension fund question: 17% of the top performers have a private pension fund, which compares with only 5% for those who answered three to four questions correctly. The link to pension funds is less clear cut than in the literature (e.g. Brown and Graf, 2013), which may relate to the fact that, given Austria's comprehensive public pension system, pension funds are generally not much sought after. There appears to be no

clear link between financial knowledge scores and the tendency to compare alternative financial offers.

## 5 Summary and implications

Overall, our results reveal that – like in many other countries – there are remarkable financial knowledge gaps among the Austrian population, especially among women, younger and older people as well as those with a low level of education. Our analysis also suggests that this lack of financial knowledge may be conducive to risky financial behavior, such as insufficient saving for bad times or retirement, basing financial decisions on little advice or comparison or taking out loans for adverse reasons, e.g. impulse purchases or gifts.

Prudent and sound financial decisions by financial market participants support central banks in fulfilling their financial stability mandate. Furthermore, it is easier for central banks to communicate monetary policy decisions if the population has a high level of financial literacy. A better understanding of monetary policy helps predict forthcoming decisions, which in



turn speeds up the transmission to the real economy and hence makes monetary policy more effective.

It is therefore in the clear self-interest of central banks to provide targeted and tailored financial education, especially to the most vulnerable groups of the population, either directly or via multipliers, such as teachers, journal-

ists or financial service providers. As independent and non-commercial expert organizations, central banks are also natural leaders in financial education activities. The results of the new dataset on the knowledge gaps of the Austrian population are an important contribution to shaping the future financial education activities of the OeNB.

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## Annex

Table A1

## Characteristics of respondents with especially high and low financial literacy

	All respondents (unweighted)	All respondents (weighted) <sup>1</sup>	Correct ≥9 (weighted) <sup>1</sup>	Correct ≤3 (weighted) <sup>1</sup>
	%			
TOTAL			35.69	8.42
GENDER				
Male	46.64	48.12	42.46	6.67
Female	53.36	51.88	29.40	10.05
AGE				
15–29 years	16.70	20.93	29.11	9.96
30–44 years	23.77	24.54	33.90	8.03
45–59 years	27.03	26.65	39.48	6.32
60 years and above	32.5	27.88	38.57	9.61
EDUCATION				
Education – low <sup>2</sup>	16.15	17.59	18.20	20.09
Education – vocational training <sup>3</sup>	57.37	55.62	34.41	6.93
Education – high <sup>4</sup>	26.48	26.79	49.82	3.86
HOUSEHOLD INCOME				
Income below EUR 2,000	42.43	41.05	31.17	10.07
Income EUR 2,000–3,400	37.71	38.1	39.11	5.30
Income over EUR 3,400	14.89	14.92	46.86	6.19
Income not indicated	4.96	5.93	16.80	22.67
EMPLOYMENT STATUS				
Employed (more than 35 hours per week)	40.87	41.78	33.64	5.36
Unemployed	3.86	4.14	34.69	7.80
Not working	38.01	36.03	34.97	11.38
Employed part time (max. 35 hours per week)	11.53	11.67	38.19	7.11
Self-employed	6.67	6.67	50.82	5.93
TOWN SIZE				
Town size (up to 5,000 inhabitants)	43.78	43.97	32.95	9.82
Town size (5,000–1 million inhabitants)	36.21	35.62	34.00	7.46
Town size (Vienna)	20.01	20.41	44.53	7.10
N	1,994	1,994	728	150

Source: OeNB.

<sup>1</sup> Weights based on external population statistics on age and gender at the province level.<sup>2</sup> At most completed compulsory education.<sup>3</sup> Apprenticeship; technical, commercial or vocational education not qualifying for university.<sup>4</sup> Secondary academic or vocational education qualifying for university education; other education qualifying for university education; university of applied sciences; technical or vocational college; university; bachelor's, master's and doctoral degrees.

# Implications of ultra-low interest rates for financial institutions' asset liability management – a policy-oriented overview

Christian Beer,  
Ernest Gnan<sup>1</sup>

*In a historical perspective, interest rates are currently very low. The further course of nominal and real interest rates crucially depends on how the macroeconomy will develop over the cycle and in a long-term structural perspective. In this contribution, we analyze how ultra-low interest rates affect financial institutions and their asset-liability management. In the short term, the impact depends on the relative duration of assets and liabilities. Hence, different financial institutions are affected differently depending on their balance sheet structures. Yet in the long term, the income of all types of financial institutions tends to suffer from ultra-low interest rates. A protracted period of (ultra-)low interest rates might compromise financial stability by eroding financial intermediaries' capital; by amplifying the risk of bubbles and bursts; by heightening bond market volatility and its potential to trigger runs and fire sales in illiquid markets; and by causing risk positions to grow in the search for yield. Consequently, risks from a protracted period of ultra-low interest rates have been gaining attention from financial regulators and supervisors. Adequate action requires an integrated view of monetary policy, macroprudential and microprudential regulation and supervision of various types of financial intermediaries including banks, institutional investors and shadow banks.*

*JEL classification: E43, G2, G38*

*Keywords: ultra-low interest rates, asset-liability management, financial institutions*

In response to the crisis, central banks worldwide have slashed official interest rates to historically low levels; and by adding a range of nonconventional monetary policy measures, notably large-scale bond purchases, they have also depressed medium to long-term risk-free interest rates and compressed risk premiums. As a result, prices for noninterest-bearing asset classes, such as stocks and real estate, have soared, depressing yields in these markets as well.

Given such low rates and yields, financial intermediaries – and in fact public sector entities, nonfinancial firms and households, too – face a number of challenges and open questions. First, on the asset side, how to cope with the low level of yields, now and in

the foreseeable future? Second, also on the asset side, how to cope with the risk arising from an eventual normalization of yield and price levels (interest rate, price and market risks and the potential risk of financial turbulence and global real and financial repercussions). Third, on the liabilities side, how to behave optimally in the face of low financing costs, now and in the near future; in other words, to what extent to borrow at variable or fixed rates? How to deal with legacy liabilities contracted at higher cost? Finally, how to integrate asset and liability management to ensure overall optimal performance while containing risk, and to match prospective income and expenditure flows from financial and nonfinancial sources.

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To approach these questions, asset-liability managers need to form a view and build scenarios on the future path of nominal and real interest rates as well as other asset prices that are influenced by, or move jointly with, these developments. Several aspects need to be considered here. First, how is the business cycle going to develop? Will there be a lasting economic recovery, at what pace, and with what differences across world regions? Second, how is inflation going to develop, reflecting the contribution of output gaps, oil prices and other supply-side factors, as well as inflation expectations? Third, how are central banks going to react: how fast will the exit happen in those areas, such as the United States, where the recovery is well on its way? How will the Eurosystem's Extended Asset Purchase Programme proceed depending on outcomes for inflation, inflation expectations and the real economy, and how will an exit from ultra-expansionary policies eventually be engineered and timed? Fourth, in a longer-term perspective, the important question has been raised whether the euro area might be heading towards a period of secular stagnation. The implication would be that the natural rate of the real interest rate might be very low or even negative for what might be a very long time.

This article attempts to pin down this topic by mapping out the main themes and lines of discussion. Section 1 reviews the factors driving nominal

and real interest rates and asset prices in the short and long run. In section 2 we offer a short overview of asset-liability management. Building on this, sections 3 and 4 discuss relevant considerations on asset and liability management in the current environment of ultra-low interest rates for three types of actors: banks, insurance companies and investment funds.<sup>2</sup> Section 5 summarizes and concludes.

## 1 Interest rates and asset prices – perspectives and scenarios

Interest rates are currently extremely low by historical standards. Central banks lowered policy rates to around zero (in some cases slightly or markedly below zero) and additionally pursued various forms of unconventional monetary policy, notably large-scale purchases of various types of bonds,<sup>3</sup> in response to the economic and financial crisis. After a crisis-related increase in risk premiums during the financial and sovereign debt crisis, long-term interest rates embarked on a downward trend for several years, as a result of which real long-term interest rates<sup>4</sup> have been oscillating around zero in a number of euro area countries (chart 1).

Interest rates in the euro area are currently considerably lower than in other major monetary areas and comparable with rates in Japan. The euro area yield curve has come to be quite flat and was extremely flat in the first four months of 2015. While flat yield curves were observed earlier (e.g. in

<sup>2</sup> In fact, a fully-fledged analysis should also consider other actors (e.g. households) and the interdependencies between economic actors, in particular if the focus is on some long-run effects (e.g. pricing bubbles). Nevertheless, an analysis of the effects of low interest rates on the various economic actors taken each one by one can offer important insights.

<sup>3</sup> A central bank can conduct quantitative easing also by purchasing other assets than long-term bonds. For example, Christensen and Krogstrup (2015) introduce a reserve-induced channel of quantitative easing that works through higher holdings of central bank reserves by commercial banks. This channel works independent of the specific type of asset the central bank purchase.

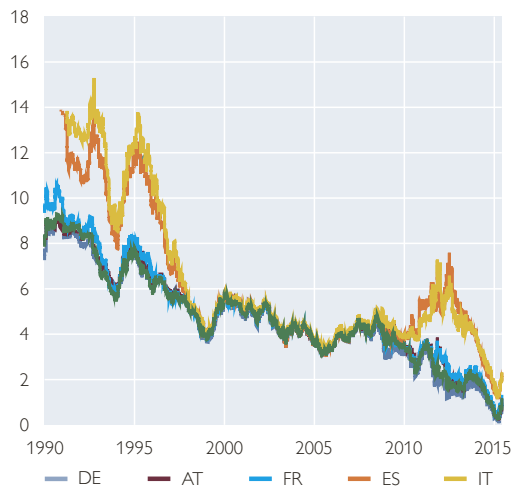
<sup>4</sup> Calculated as yield on ten-year benchmark government bonds minus current HICP inflation.

Chart 1

## Ten-year bond yields

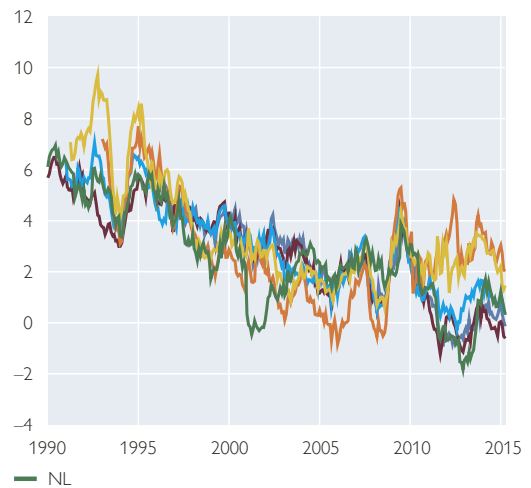
### Ten-year yields

Benchmark government bonds,  
daily data, cut-off date = June 10, 2015  
%



### Real ten-year yields

Benchmark government bonds,  
ten-year minus HICP inflation, monthly data up to April 2015  
%



Source: Thomson Reuters, ECB, Authors' calculations.

1999 or in 2008) interest rates were moving at higher levels at the time (chart 2, middle panel). Compared with other economic areas, the yield curve slope (calculated as the difference between ten-year and one-year yields) in the euro area is currently well below the levels in the U.S.A. and the U.K. (chart 2, lower panel).

Yields on government bonds from various European countries have increased recently, starting in early May 2015. Several explanations for this development were given (see e.g. the statements of Draghi in ECB, 2015b):

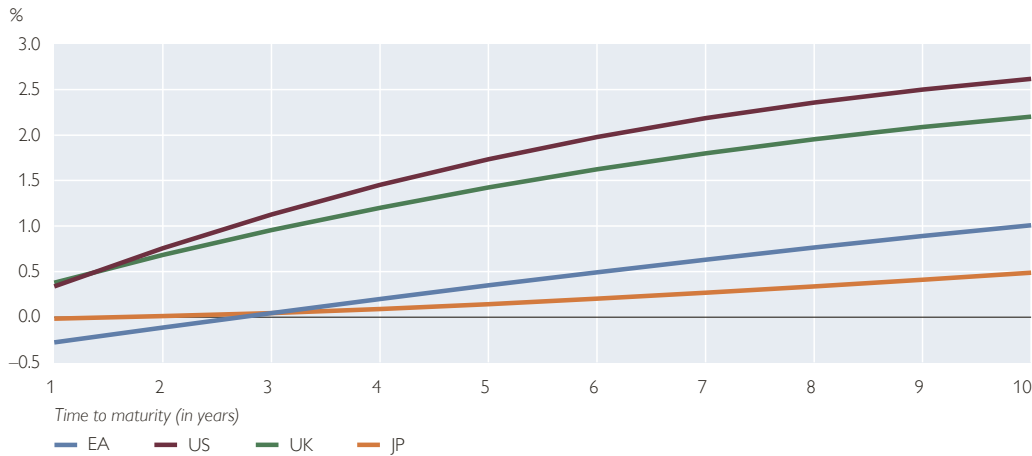
Improvement in growth perspectives, higher inflation expectations, technical conditions of the affected markets, increased volatility, and a drop in market liquidity.

Low interest rates have boosted other asset prices, in particular stock and real estate prices (chart 3) and – in the case of residential property – above all in those countries that remained unaffected by property price bubbles, prior to the crisis. Plus, relative interest rate changes and expectations thereof seem to have driven exchange rates as well.

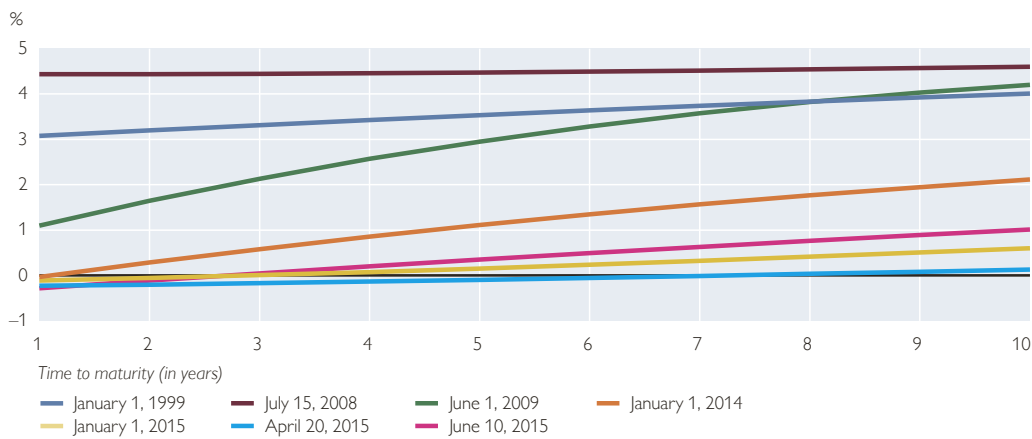
Chart 2

## Yield curves

### Global yield curves as at June 10, 2015

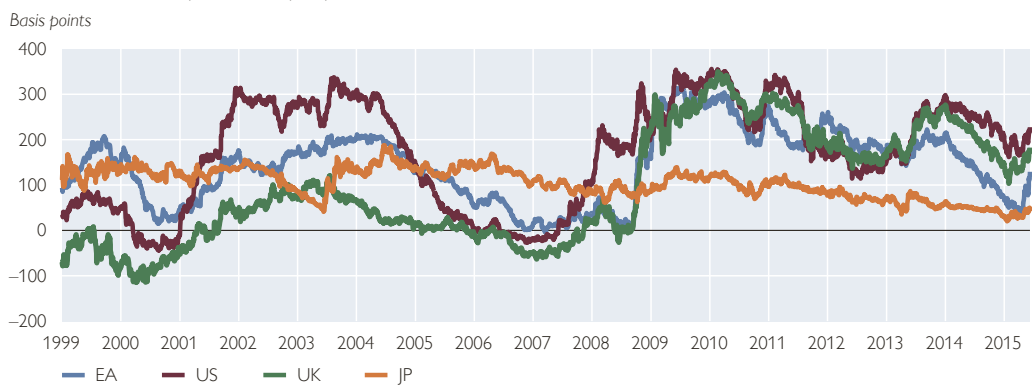


### Euro area yield curve over time



### Global yield curve slope over time

Difference between ten-year and one-year yields



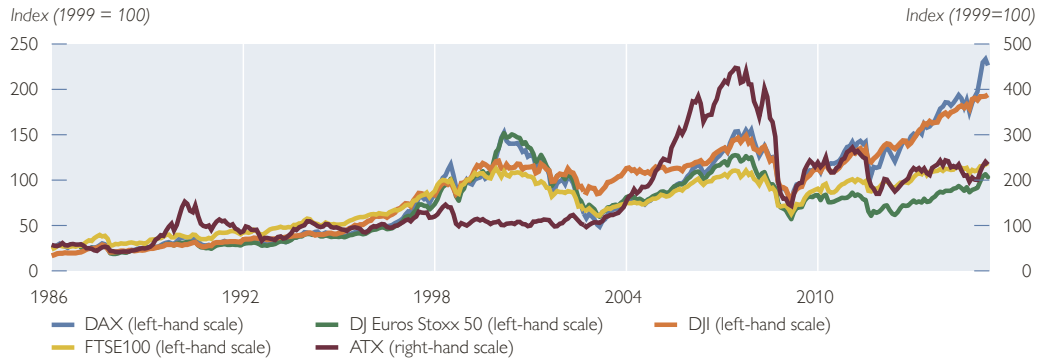
Source: Thomson Reuters.

Note: Cut-off data for data = June 10, 2015. Government bonds; for the euro area, AAA-rated government bonds.  
EA = euro area.

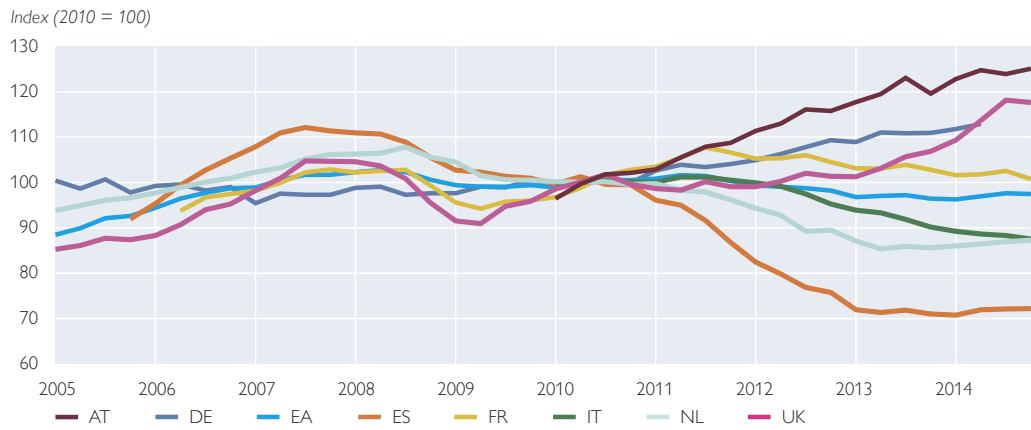
Chart 3

## Asset prices

### Global stock markets



### European residential property prices



### Euro exchange rates



Source: Eurostat, OeNB.

Note: EA = euro area.



To gain some understanding of the long-term trends that contributed to the current ultra-low interest rate environment, it is useful to consider the concept of the equilibrium real interest rate<sup>5</sup>, an idea going back to 19<sup>th</sup> century theories by Wicksell. More recently, the equilibrium real interest rate was defined e.g. by Bernanke (2015a) as “the real interest rate consistent with full employment of labor and capital resources, perhaps after some period of adjustment.” It follows that the equilibrium real interest is consistent with a stable rate of inflation and represents a hypothetical rate of interest that depends on structural factors. In the absence of cyclical fluctuations, the equilibrium interest rate would equate savings with investments and is hence affected by the factors driving saving and investment decisions. A drop in the demand for loanable funds (i.e. primarily for investment purposes) and an increase in the supply of loanable funds (i.e. savings) will lead to lower real interest rates. Accordingly, a savings-investment framework (as used e.g. by the IMF, 2014a) can shed light on the evolution of the real interest rate.<sup>6</sup>

A large part of the supply of capital is generated by household savings. Hence, factors that affect households’ savings decisions also determine the supply of loanable funds. Economic theory (e.g. the permanent income hypothesis, life cycle hypothesis) predicts

that savings are determined by households’ rate of time preference, changes in current and expected income as well as uncertainty (e.g. precautionary savings). On an aggregate level, savings are also determined by demographic factors, e.g. the proportion of young households that save for retirement to retired households that tend to dissave.

The IMF (2014a) argues that savings behavior changed because of the large increase in the saving rates in emerging market economies in the first decade of the 2000s.<sup>7</sup> Another factor that may have contributed to an increasing supply of capital is increasing income inequality, which implies that a higher proportion of aggregate income is earned by groups with a higher propensity to save (Summers, 2014b).

On the demand side, the drop in investment, itself triggered by low growth and low growth expectations, may have depressed equilibrium interest rates. The IMF (2014a) observes that investment in advanced economies declined in recent years because of low investment profitability as a result of the financial crisis.<sup>8</sup> Summers (2014a) argues that the demand for debt-financed investment declined amongst other things because many high-tech companies have a large stock of cash and the founding of high-tech companies requires only little capital investment.

<sup>5</sup> Similar concepts are the natural or neutral real interest rate. For a discussion of different concepts as well as the calculation of the natural rate of interest, see also Crespo Cuaresma et al. (2005).

<sup>6</sup> The IMF (2014a) takes the view that because of financial integration, interest rates are determined largely by common global factors. Consequently, in assessing the drivers of equilibrium long-term real interest rates, global developments should be taken into account. However, in the presence of home bias (which can have various reasons such as regulation favoring domestic sovereign bonds, various forms of other de facto restrictions on the free flow of capital, as well as information asymmetries), actual real short- and long-term interest rates can be heavily influenced by conventional and unconventional monetary policies, various risk premiums etc.

<sup>7</sup> For a discussion of a global savings glut and its economic implications, see Bernanke (2005, 2015b).

<sup>8</sup> In contrast, the IMF (2014a) attributes the reduction in investment from the 1980s to the early 2000 to a drop in the price of investment goods.

Moreover, according to the IMF (2014a), a large part in the decline of real risk-free interest rates between 2000 and 2010 was due to an increase in the relative demand for safe versus risky assets, i.e. bonds versus equity. Fiscal policy could also affect savings and investment amongst other things through its impact on private investment<sup>9</sup> or the impact of public borrowing on the interest rate. However, the IMF (2014a) does not empirically find a significant effect of fiscal policy on the evolution of equilibrium interest rates after the 1990s.

For a comprehensive analysis, it is important to go beyond the determinants of the risk-free rate, as observed interest rates are also affected by risk considerations. Accordingly, observed interest rates in some countries could be higher than average rates because of various forms of risk premiums (credit risk, redenomination risk, inflation risk, liquidity risk).

Looking ahead, several scenarios are currently being debated among analysts, commentators and in policy circles regarding the future development of real interest rates in the euro area (see e.g. EIOPA, 2014b; Focarelli, 2015; IMF, 2014a; Moser et al., 2015; Swiss Re, 2012):

First, a gradual increase of inflation and nominal interest rates, with real yields returning to positive territory. Such a scenario assumes that the economic recovery continues, and that in-

flation and inflation expectations are well anchored above zero.<sup>10</sup>

Second, a prolonged period of (ultra-)low interest rates (“Japanese scenario”): This scenario is related to the debate on secular stagnation.<sup>11</sup> Summarizing the literature on secular stagnation, Teulings and Baldwin (2014) conclude that a broad consensus has emerged that secular stagnation can be defined as a situation in which negative real interest rates are needed to equate savings and investments. In a similar vein, Summers (2014b) notes that “it may be impossible for an economy to achieve full employment, satisfactory growth and financial stability simultaneously simply through the operation of conventional monetary policy.”

The IMF (2014a) expects interest rates to remain low (at least in the medium term) even after some improvement of the economic situation and a shrinking of the output gap because of persistent effects of the crisis (e.g. subdued investment<sup>12</sup>). Because of stronger financial sector regulation, it is likely that the high demand for safe assets will continue.

A third scenario, which was vividly discussed when global unconventional monetary policies were started but has lost attention recently in the face of very low inflation outturns, might, according to some observers, materialize if inflation and inflation expectations were to rise sharply at some point, e.g. if central banks exited expansionary

<sup>9</sup> According to standard economic theory, public investment can crowd out private investment. However, in the current situation of economic slack, public infrastructure investments might actually “crowd in” private investment (IMF, 2015).

<sup>10</sup> Ultra-easy monetary policy can facilitate such a scenario also via the exchange rate channel, i.e. lower interest rates lead to currency depreciation, which in turn has a positive effect on exports and eventually on growth. However, it is evident that not all countries can pursue such a strategy at the same time.

<sup>11</sup> This term was (re-)introduced by Summers in 2013 in a speech at the IMF (see also Summers, 2014a).

<sup>12</sup> For an assessment of investment prospects, see e.g. Banerjee et al. (2015).

monetary policies too late (see e.g. Focarelli, 2015).

Such scenarios must also be seen against the backdrop of an observation made by many commentators these days, namely that, at least during a period of large-scale asset purchases by central banks, yields – also those on longer maturities and risky assets – may to a considerable extent be determined by current and expected central bank policy. This is why central banks’ action is so closely monitored by financial market analysts and investors. According to some critics, however, such a focus may also risk to divert analysts’ attention from underlying real economic fundamentals, which should drive real interest rates in the long run, creating the risk of bubbles – both in financial markets as well as other markets (e.g. real estate) – in the short to medium term.

## 2 Asset-liability management – a short nontechnical overview

Asset-liability management (ALM) can be defined as a “process of formulating, implementing, monitoring, and revising strategies related to assets and liabilities to achieve an organization’s financial objectives, given the organization’s risk tolerances and other constraints” (Society of Actuaries, 2003). Joint consideration of assets and liabilities, aimed at managing the assets and liabilities of a company in a coordinated manner, is an improvement above more traditional approaches to risk management and financial planning that dealt with the two sides of the balance sheet more or less separately.

Initially, ALM was practiced primarily by financial corporations; today it is also common among nonfinancial corporations.<sup>13</sup> The traditional focus on interest rate and liquidity risk has since been broadened to cover a wider range of risks, including equity risk, legal risk, currency risk, counterparty risk and sovereign or country risk. In the current environment of protracted low interest rates, the original focus on interest rate risk is of immediate relevance for financial institutions. Focusing on interest rate risk, Brick (2014) offers the following narrow definition of ALM: “Asset-liability management (ALM) is a forward-looking process involving the joint and simultaneous management of assets and liabilities to measure, monitor, and control the effects of changing interest rates on income, asset values, liquidity, and regulatory capital.” Ultimately, risks from low interest rates imply ultra-low yields and high asset valuations for all kinds of asset classes. Thus, price risk is intricately linked to interest rate risk and needs to be considered simultaneously. Another crucial element to be considered by ALM is the liquidity of balance sheet positions, as a measure of a firm’s ability to preserve its ability to pay. Of course, off-balance-sheet positions must also be taken into account (e.g. the interest rate swaps used for hedging interest rate risk).

Because of our focus on interest rate-related aspects of ALM, we first briefly review some aspects of interest rate risk. The BIS (2004) defines interest rate risk as “exposure of a bank’s financial condition to adverse movements in interest rates” and distin-

<sup>13</sup> In addition, ALM considerations may affect the decisions of sovereigns and private households. However, implementing ALM outside financial corporations needs to take into account differences in the balance sheet structure. For example, the assets of nonfinancial corporations include machinery and equipment.

guishes the following types of interest rate risk: First, the risk arising from different repricing dates or different maturity/tenor of assets and liabilities (repricing risk). Second, the risk stemming from changes in the slope of the yield curve when interest rates for different tenors are affected differently by rate changes (yield curve risk). Third, the risk stemming from the fact that interest rate adjustment of variable rate asset and liabilities can be determined by different rates (basis risk). Fourth, risk that arises from option-like elements of balance sheet items (optionality). A case in point is the loss of profitable loans for banks due to early redemption and the need to re-invest in unfavorable market conditions.

As outlined by the BIS (2004), banks' interest rate exposure can be assessed from both an earnings perspective and an economic value perspective. The earnings perspective focuses on near-term earnings and uses e.g. the net interest margin as an indicator. Taking into account the economic value of a bank, which is defined as the present value of expected net cash flows, allows a more comprehensive and long-term view. Furthermore, embedded losses that reflect how past interest rate development may affect future performance should also be considered, in particular for instruments that are not marked to market.

To gain a first indication of the interest rate risk institutions face, supervisors calculate impact of standardized interest rate shocks, also known as Basel interest rate shock (see BIS, 2004; Bundesbank, 2012; EBA, 2015).

ALM uses various methods to identify risks. Traditional approaches include gap analysis to identify gaps in

maturity or repricing dates and duration analysis to identify duration gaps, the idea being that knowledge of the impact of interest rate changes on both the asset and the liability side will help financial institutions immunize balance sheets against the adverse consequences of interest rate changes. However, these more traditional approaches are of limited suitability if balance sheet items exhibit option-like elements. More sophisticated frameworks apply techniques to model both sides of the balance sheet stochastically or use dynamic approaches, which are more widespread today. For example, scenario analysis develops various interest rate scenarios and eventually establishes the impact of each scenario on the balance sheet. After identification, these risks can be managed and hedged in various ways, including the use of interest rate swaps or derivative instruments. Since interest rate risk is a potential source of profits for financial institutions, these risks are not necessarily hedged completely.

In this respect, it should be taken into account that in a low interest rate environment changes in interest rates as well as changes in future expected cash-flows (e.g. dividends) of assets have a more pronounced impact on asset prices because the future is less heavily discounted compared to a high-interest rate environment. In other words, low interest rates are a source of volatility. Higher volatility also affects the price of derivatives used for hedging. Altogether, a low interest rate environment can make hedging more difficult. This short discussion should make it obvious that the application of ALM requires sophisticated models.<sup>14</sup>

<sup>14</sup> A more detailed discussion of quantitative models in ALM is beyond the scope of this contribution.

Table 1

### Stylized balance sheets of financial institutions

Assets	Liabilities
<b>MFI</b>	
Loans (including loans to other MFI)	Deposits (including deposits from other MFI)
Holdings of debt securities	Debt securities issued
External assets	External liabilities
	Capital and reserves
<b>Insurance corporation</b>	
Securities other than shares (mostly fixed income securities)	Net equity of households in life insurance reserves
Investment fund shares	Prepayments of insurance premiums and reserves for outstanding claims
Shares and other equity	
<b>Pension fund</b>	
Investment fund shares	Net equity of households in pension fund reserves
Securities other than shares	
Shares and other equity	
<b>Investment fund</b>	
Debt securities	Investment fund shares issued
Equity	
Investment fund shares	

Source: The table shows the most important balance sheet positions based on aggregated balance sheet statistics from the ECB.

Banks, insurance companies, pension and investment funds fulfill different roles (e.g. lending versus providing a vehicle for long-term financial investments) and use – to some extent – different instruments (e.g. only banks assign loans). Furthermore, they are subject to different regulations. This also affects the incentive structure of managers. Consequently, the purpose of a financial firm will generally determine at least one side of its balance sheet. For example, the promise of pension funds to pay pensions later entails long-term liabilities. Because of ALM considerations, such structural determination of one side of the balance sheet also affects decisions about the other side of the balance sheet. Table 1 shows stylized balance sheets of financial institutions in the euro area and suggests a heavy impact of the business model on the liability side of

(life) insurance companies and pension funds. Consequently, the task of ALM is to invest in instruments that will limit the duration mismatch between assets and liabilities. Likewise, the asset side of an investment fund will be determined by its investment style whereas its liability side will be heavy on equity, in line with its business purpose. Finally, the economic function of banks as intermediating between savers and borrowers determines at least part of both a bank's asset (loans) and liability side (deposits). Hence, the task of ALM is to minimize mismatches between the characteristics of loans assigned and deposits taken, while bearing in mind that e.g. maturity transformation from shorter-term liabilities into longer-term loans is a major function of banks, and also a source of revenue. In the following sections we will discuss these sectoral features in more detail.

### 3 Banks

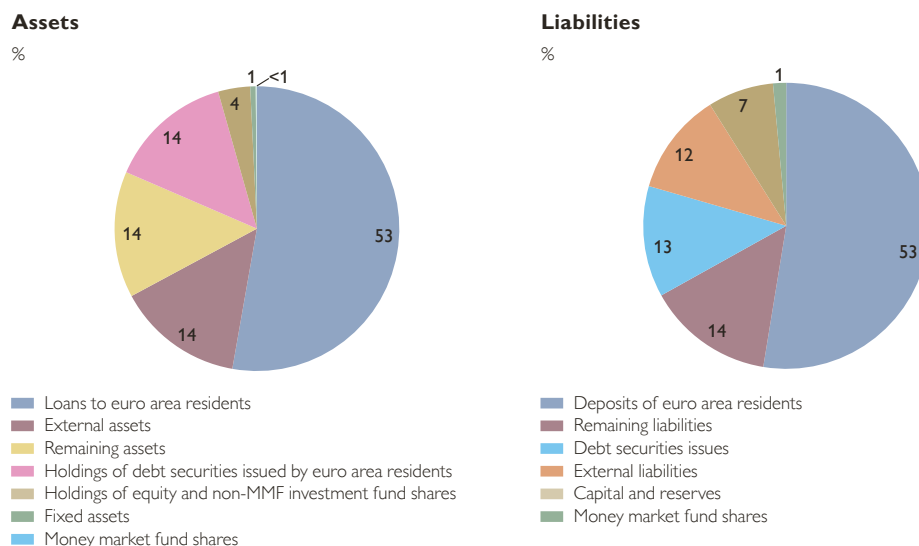
The economic functions of banks include maturity, size, liquidity and risk transformation. These activities intrinsically entail various risks, including interest rate risk.<sup>15</sup> While managing these risks is part and parcel of a bank's business, a low interest rate environment can affect banks' exposure to interest rate risk in various ways.

The breakdown of the aggregate balance sheets of euro area monetary financial institutions (MFIs, i.e. essentially banks as well as money market funds) illustrates that their interest income and payments hinges essentially on the development of interest rates on loans and deposits as well as debt securities held or issued (chart 4). Initially, lower interest rates may even benefit banks as they lower funding costs and trigger a reappraisal of assets. Banks usually also profit from a parallel down-

ward shift of the yield curve because – unlike in the case of life insurers (see below) – the duration of deposits is typically shorter than the duration of assets. However, in a protracted period of ultra-low interest rates, it is quite likely that the yield curve becomes flatter. The flattening is supported by the zero floor on interest rates on deposits as long, as it is not (legally) possible or not appropriate to charge negative interest rates on deposits. Consequently, net interest margins are compressed and the income from maturity transformation is reduced. However, if banks' refinancing rate falls sharply in negative territory – as it is currently the case in Switzerland – banks' interest rate margins may actually expand, if for legal reasons interest rates on loans are subject to a zero lower bound.<sup>16</sup> Of course, the effect of changes of the yield curve on loan and deposit interest

Chart 4

#### Aggregated balance sheet of euro area MFIs (excluding the Eurosystem)



Source: ECB.

Note: As of March 2015; MMF = money market fund. Loans to/deposits from euro area residents also include loans/deposits to/from MFI.

<sup>15</sup> Banks need not necessarily bear all the interest risks of e.g. a loan, because risks can also be transferred to customers (e.g. variable rate loans). See also the discussion at the end of this section.

<sup>16</sup> This issue is discussed further in OeNB (2015a).

rate depends also on the market power of banks. Furthermore, interest rate changes affect the present value of future cash flows and consequently the underlying value of banks' assets, liabilities, and off-balance sheet instruments (BIS, 2004).

Chart 5 gives some indication on the correlation between lending margins (difference between interest rates on loans for house purchases or business loans and on deposits) and the slope of the yield curve. The chart suggests that in Germany, the Netherlands, and France, lending margins on housing loans to households tend to be higher the steeper the yield curve. On the other hand, yield curve slope and lending margins for loans to nonfinancial corporations are only correlated in Germany and to some extent in the Netherlands. It is likely that one factor that affects the relationship between lending margins and the yield curve slope is the interest rate fixation period. A high share of variable rate loans, as e.g. in Austria or for loans to nonfinancial corporations in many euro area countries, reduces the correlation between these two variables since the impact of a flatter yield curve on income from maturity transformation is less pronounced.<sup>17</sup> Obviously, such a simple analysis cannot thoroughly analyze the existence of a link between these two variables.

The – initially- ambiguous effect of low interest rates on banks is also reflected in the ECB's May 2015 Financial Stability Report. According to ECB

(2015a) in the euro area as a whole, banks' operating income showed some improvement in 2014. This improvement can be mainly attributed to higher net interest income in vulnerable countries because of a decline in funding costs. However, the ECB (2015a) expects that it will become difficult to further improve net interest income because of the low interest rate environment and a flattening of the yield curve.

Simulations from Banca d'Italia (2015) suggest that the Eurosystem's Extended Asset Purchase Programme will increase profits of Italian banks. Different and partly opposing effects are at work: On the one hand, there is a negative impact on net interest income because of a drop in lending rates that cannot be offset by lower deposit rates since deposit rates are already close to zero.<sup>18</sup> On the other hand, it is expected that other revenues of Italian banks increase particularly because of higher earnings from security trading.

Regarding the impact of compressed interest margins on banks' profitability, the Joint Committee of the European Supervisory Authorities (2014) sees "fundamental structural issues in terms of the sustainability of some business models which have not adapted to the low interest rate environment, and creating pressure on the net interest margins of banks as well as profitability concerns."

Likewise, empirical findings by Lambert and Ueda (2014<sup>19</sup>) using data from U.S. banks suggest that uncon-

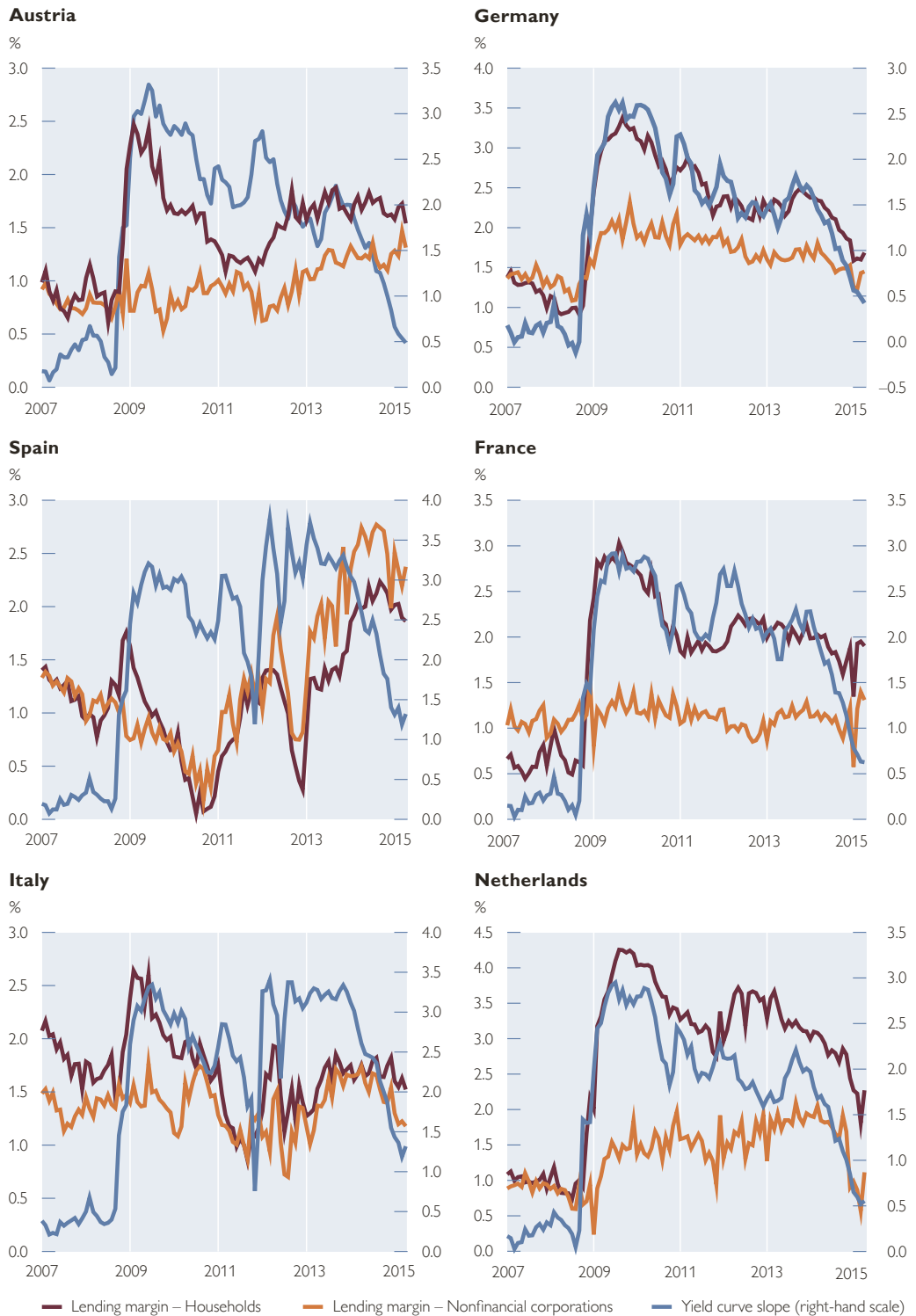
<sup>17</sup> Regarding Spain and Italy it is likely that country-specific repercussions of the economic and financial crisis blurred any relationship between the two variables.

<sup>18</sup> This effect is particularly important in 2015; for 2016, Banca d'Italia (2015) expects an amelioration of net interest income because of increased lending volumes.

<sup>19</sup> See also Lambert (2015).

Chart 5

### Yield curve slope and lending margin



Source: ECB, Thomson Reuters.

Note: Lending margins is defined by the ECB as the difference between MFIs' interest rates for new loans (in case of households housing loans) and a weighted average rate of new deposits from households and NFCs. Monthly data up to April 2015.



ventional monetary policy<sup>20</sup> initially has a small positive effect on bank profitability. Yet when unconventional monetary policy persists for a protracted period, the negative impact outweighs the initial positive effect, leading to a slightly negative effect on balance.

Analyzing also the effects of unconventional monetary policy on risks, Lambert and Ueda (2014) find that potential effects of ultra-low interest rates may include increased risk-taking (search for yield, encouraging leverage) and delayed balance sheet repair (e.g. evergreening of loans). Their regression results suggest that banks reduce their leverage, though only to a very small degree. Furthermore, as expected, banks increase their risky assets. Regarding balance sheet repair, Lambert and Ueda (2014) also find evidence for evergreening of nonperforming loans. In addition, the U.S. banks considered took advantage of lower long-term interest rates to extend the maturity of their debt and reduce the risk of maturity mismatches. At the same time, research into potential risk-related aspects of low interest rates by Maddaloni and Peydró (2010), using data from the euro area bank lending surveys and the U.S. senior loan officer surveys, implies that low short-term (i.e. policy) interest rates gave rise to softer lending standards in the run-up of the financial crisis. Moreover, the effects of low short-term rates on lending standards were reinforced by securitization activity and weak supervision, and they were the more pro-

nounced the longer interest rates were low. This was especially the case for mortgage loans.

A further and ALM-related effect of a protracted period of ultra-low interest rates is the potential reduction in banks' "natural duration netting" capacity. With ultra-low interest rates, the balance sheet structure of a bank is likely to change. On the liability side, customers tend to move from fixed-term deposits into nonmaturing (e.g. sight) deposits.<sup>21</sup> On the asset side, customers may, depending on their interest rate expectations (or their risk-taking behavior), either increasingly prefer longer tenors for fixed rate loans or variable rate loans linked to currently ultra-low base interest rates. If the duration of assets increases by more than the duration of liabilities<sup>22</sup>, the net asset duration gap would widen. As a result, the balance sheet would exhibit a lower degree of natural duration netting capacity, and the reliance on external markets to hedge interest rate risk would increase (Moser et al., 2015).

Moreover, banks need to be aware of potential technical and operational problems in an ultra-low environment, and in particular in a negative interest rate environment. Amongst other things, banks need to ensure that their business infrastructure (e.g. derivative models, value at risk models) and their IT systems can handle negative rates and yield reasonable results. In addition, customer behavior might change, with negative rates potentially affecting the stability of deposits. Hence, banks

<sup>20</sup> In their regression, they include variables that account for the monetary policy stance ("Taylor rule" residuals), changes in the ratio of central bank assets to GDP, and the time duration of low interest rates.

<sup>21</sup> Comparing this analysis with the results from Lambert and Ueda (2015) above also indicates that the effects of a prolonged period of low interest rates depends on whether retail deposits or market instruments play a more prominent role in the funding of banks.

<sup>22</sup> The duration of liabilities will only increase if the duration of nonmaturing deposits is higher than the duration of fixed-term deposits.

need to scrutinize their deposit modeling (Ibel, 2015).

If banks' income suffers from interest rate developments, higher fees in combination with low or zero interest rates on deposits are potential mitigation measures. However, depositors may always respond by holding their savings in the form of banknotes instead.<sup>23</sup> Furthermore, the feasibility of introducing or increasing fees also depends on competition. An assessment of banks' exposure to interest rate risk should also take into account that banks can in principle shift interest rate risk to their customers in the form of variable rate loans and variable rate deposits and savings accounts. In Austria, for example, variable rate loans are quite common (indeed, the share of variable rate mortgage loans has been steadily on the rise in recent years). However, this implies higher credit risk, as borrowers may be unable to repay their loan at higher future interest rates, and the likelihood that the collateral loses in value when interest rates increase (Hellwig, 2011).<sup>24</sup> Another issue that arises in this context is how legacy variable-rate loan contracts would deal with negative interest rates triggered by a mechanical application of existing interest rate clauses.<sup>25</sup>

#### 4 Institutional investors

For institutional investors, the impact of ultra-low yields and the accompanying developments is immediate, which

has triggered an active debate among supervisors and in the industry.

First, as market yields are declining, securities portfolios benefit from substantial windfall gains, as the prices of bonds and other asset classes such as stocks and real estate are soaring. This development may risk generating excessive and unrealistic yield expectations on the part of institutional investors' customers. Life-insurers and pension funds are confronted with an immediate increase in liabilities because the discounted value of future cash flows changes.

Second, when yields have reached their lowest level bond prices will no longer rise, and this may also be associated with an end to the rise in the prices of other asset classes. During this phase at the latest, investors and their customers will need to adjust their yield expectations to a new lower level. The adjustment of expectations may also trigger a rebalancing of portfolios, leading to asset sales and price declines in various asset classes, further depressing portfolio performance.

Third, at some point in the future (as outlined in section 1, various scenarios are conceivable) the interest rate cycle will reverse and nominal yields will move up again. Then, holders of long-term fixed rate bonds will suffer valuation losses, and, depending on other factors influencing earnings and price expectations, this will happen in other asset classes as well.

<sup>23</sup> This issue is being actively debated in Switzerland, where pension funds and other institutional investors actively consider holding cash in the form of banknotes should they be charged negative interest rates on bank deposits (see FAZ, 2015). However, the usefulness of such an action also depends on the acceptance of banknotes as a means of payment and restrictions to holding banknotes. For example, the Danish government wants to exempt certain retailers from the obligations to accept banknotes and coins (Reuters, 2015).

<sup>24</sup> Generally, mortgage loans have specific characteristics: Lower interest rates imply higher housing values and therefore higher collateral values increasing the creditworthiness of borrowers. Consequently, home owners might take out further loans. As a result, demand for housing and housing values might increase further. The opposite self-enforcing developments might take place if interest rates decline.

<sup>25</sup> There seems to be some disagreement whether negative interest rates on loans or deposits are legally admissible. However, this question is beyond the scope of our contribution.

To compensate for lower risk-free or low-risk yields, investors may rebalance their portfolios into higher-risk asset classes (an effect explicitly considered by central banks as part of the transmission channels of asset purchase programs under the heading of the “portfolio rebalancing channel”). This may lead to a compression of risk and liquidity premiums, which may be desirable from a short-term macroeconomic viewpoint but entails the risk of subsequent corrections, which might aggravate institutional investors’ earnings compression in the later phases of the interest rate cycle.

In the following paragraphs, we elaborate on aspects specific to two types of institutional investors: first, insurance firms and pensions funds and, second, investment funds.

#### 4.1 Insurance firms and pension funds

The balance sheet of insurance firms and pension funds reflects various

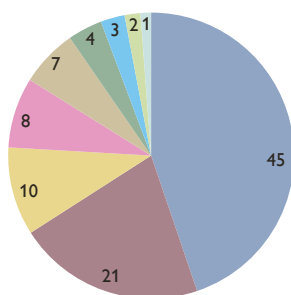
forms of contractual obligations vis-à-vis customers on the liabilities side, while insurance or pension premiums are invested in various types of assets. In a stylized simplification, these obligations come in two forms, depending on the type of insurance: Life insurance obligations (including pension insurances) have many aspects of savings contracts and often involve contractual minimum yield guarantees by the insurer to the customer. The payment obligations of nonlife insurers, in contrast, materialize in rare events, such as accidents, fire, catastrophes etc. Unlike nonlife insurance contracts, life insurance contracts (as well as contracts with pension funds) tend to be long term. Consequently, the duration of liabilities of life insurers is higher than that of nonlife insurers. As Antolin et al. (2011) note, this difference in the duration of liabilities also affects asset choice because ALM considerations suggest that the mismatch between

Chart 6

### Aggregated balance sheet of euro area insurance corporations

#### Assets

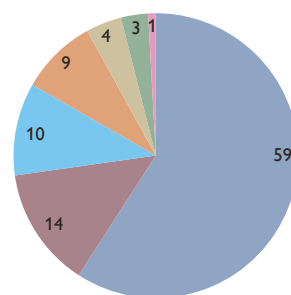
%



- Securities other than shares
- Investment fund shares
- Shares and other equity
- Currency and deposits
- Loans
- Prepayments of insurance premiums and reserves for outstanding claims
- Other accounts receivable/payable and financial derivatives
- Nonfinancial assets
- Money market fund shares

#### Liabilities

%

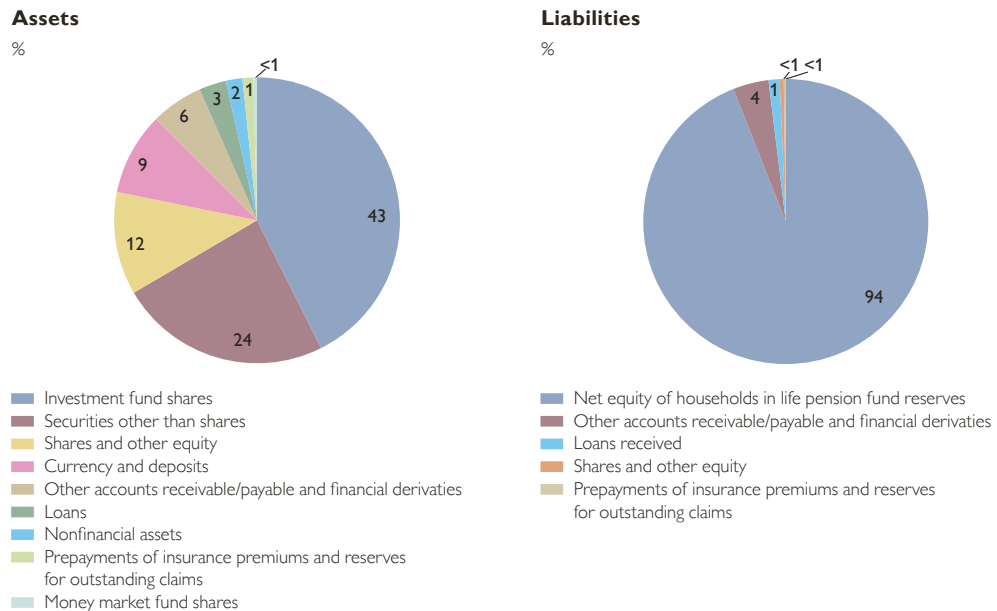


- Net equity of households in life insurance reserves
- Prepayments of insurance premiums and reserves for outstanding claims
- Net equity of households in life pension fund reserves
- Shares and other equity
- Loans received
- Other accounts receivable/payable and financial derivatives
- Securities other than shares

Source: ECB.

Note: Data refer to Q4 14.

### Aggregated balance sheet of euro area pension funds



asset and liabilities should be confined. Charts 6 and 7 illustrate the importance of securities and investment fund shares for the asset allocation of insurance corporations and pension funds.

The purpose of insurance firms' ALM is to ensure the ability to generate the cash outflows resulting from insurers' contractual obligations at all times given a firm's solvency; notably compliance with regulatory rules. Given the probabilistic nature of these outflows, buffers need to be built up for contingent outflows. The assets in which insurers invest premiums are subject to interest and price shocks and may not allow for immediate liquidation (because of the illiquid nature of an asset or because of a crisis-related drying up of markets). The cash flows to be expected from investments on an ongoing basis (interest, redemptions, dividends etc.) and from asset sales are thus risky as well.

Changes in the level of interest rates affect insurers' assets and liabilities immediately through changes in the net present value of cash flows, which is, for example, reflected in the price changes of fixed rate debt, but also in the prices of stocks, real estate and other assets. Moreover, Antolin et al. (2011) note that in a low interest rate environment increases in life expectancy have a more pronounced impact on pension funds' liabilities because future cash flows are discounted at a lower discount rate. If the maturities of assets and liabilities are not perfectly matched (which will usually be the case), assets and liabilities are affected differently by a given change in the level of interest rates. A longer maturity of liabilities (typically the case for life insurers or pension funds) relative to assets implies that a fall in interest rates increases the net present value of liabilities by more than that of assets. Such duration mismatch also entails a

re-investment risk: if high-interest rate assets mature and have to be rolled over into new ones yielding much lower returns, high guaranteed returns to customers become difficult to achieve. Furthermore, if the yield curve does not shift in parallel but twists, resulting gaps between assets and liabilities may be amplified. Here, simulations using past empirical data show that parallel shifts of the yield curve are the exception rather than the rule (see Herold and Wirth, 2015).

Many life insurers have guaranteed minimum returns to their customers, creating a floor to liabilities also during times of very low yields. Under defined benefit schemes (as opposed to defined contribution schemes) pension funds have to pay fixed pension payments irrespective of the actual yield earned on the fund's assets. These contracts expose life insurers and pension funds to substantial profitability risk during times of ultra-low yields. In this respect, the European Insurance and Occupational Pension Authority (EIOPA, 2014a) observes that life insurance companies with high exposure to guarantees pay more attention to developing effective ALM tools (in addition to restructuring their business model towards less interest-sensitive products with reduced, flexible or no interest guarantees<sup>26</sup>).

In response to ultra-low yields, euro area insurers have gradually taken on higher risk, by re-investing maturing bonds in higher-yielding ones, by extending duration and by investing in less liquid assets. The Joint Committee (2014) states some indications for search for yield in insurance companies in order to honor guaranteed rates: higher share of lower quality corporate

bonds instead of government bonds, investing in infrastructure financing, direct loans, more investment in real estate assets, equities and the establishment of partnerships with banks to fund direct loans to medium and large corporates. Various factors may result in procyclical herding-type asset allocation behavior among insurers, e.g. similarity of business models, increased use of asset managers, compliance with regulation and the use of interest rate swaps (ECB, 2015a).

The potential effects of ultra-low interest rates on financial stability have been on the agenda of European supervisory authorities for several years. Already in 2012, the ESRB General Board suggested investigating the potential impact of a low interest rate environment on the ability of long-term investors to generate adequate returns and to monitor the effects of low interest rates on the soundness of insurance companies and pension funds (ESRB, 2012). Recent assessments identify persistent low interest rates as among the key risks to the stability of the European financial system (e.g. Joint Committee, 2014; EIOPA, 2014a). Various policy and supervisory institutions have recently conducted stress test simulations to investigate the effects of ultra-low yields on insurance companies' earnings and solvency. In February 2013, EIOPA (2013) issued an Opinion on the Supervisory Response to a Prolonged Low Interest Rate Environment, which highlighted the potential solvency risks for insurers (and for occupational pension funds) from a low-yield scenario. Based on scenario analysis, EIOPA (2011) concluded that 5% to 10% of tested insurance firms would face a fall of their minimum cap-

<sup>26</sup> The reduction of guaranteed returns as well as the shift from defined benefits to defined contributions by pension funds implies that interest rate risk is transferred to customers.

ital requirement ratio below or only slightly above 100%. Stress tests conducted by EIOPA in 2014 showed that one quarter of insurers could not meet the 100% solvency capital requirement under a scenario of prolonged low interest rates (“Japanese scenario”); however, meanwhile the euro area yield curve has even fallen below EIOPA’s “Japanese scenario,” rendering these stress tests optimistic. Furthermore, these stress tests do not consider wide-ranging systemic events, which could include forced asset reallocations from a systemically important part of insurers, possibly in tandem with other institutional investors. In such events, the initial interest rate shock might be amplified, further aggravating the impact for individual insurers’ balance sheets and earnings. The ECB (2015a) confirms that interest rate risk is by far the most important driver of asset valuation losses in various stress scenarios: in recently conducted stress tests, declines in net asset values resulting from interest rate risk amount to up to 3.6% of insurers’ total assets. Against this background, EIOPA (2014a) and the IMF (2015) conclude that, first, insurance contracts with guaranteed customer returns should be fundamentally reconsidered or at least brought in line with the secular trend in returns; and, second, regulators “must improve the sector’s asset-liability matching and hedging capabilities” (IMF, 2015).

The speed at which “yield compression” becomes visible in insurers’ balance sheet depends also on accounting methods used. If historic cost accounting is used the impact on the balance sheet appears more slowly than if market values are used. The transition from

the current regulatory framework of Solvency I to Solvency II, which will be in force starting January 1, 2016, involves a transition to market value accounting, thus exposing risks previously not so obvious. Transition periods granted to insurers for full implementation of Solvency II thus aim to grant insurers a very long time window to adjust their business to comply with new regulatory standards (see EIOPA, 2013).

Developments in insurances and pension funds are closely linked to another type of institutional investors, investment funds, as it is common for them to mandate the management of portions of their asset portfolios to these specialized financial institutions (see charts 6 and 7).

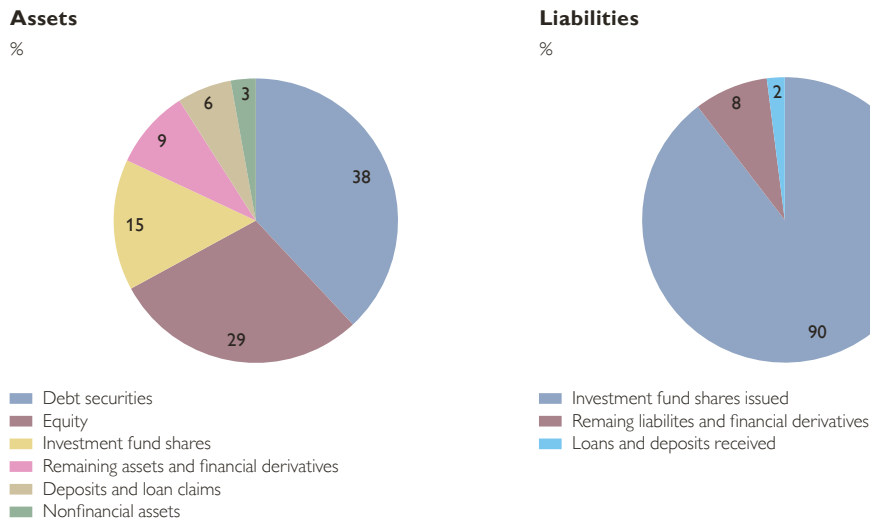
#### 4.2 Investment funds

According to the IMF (2015), the volume of assets under management of world top 500 asset managers reached USD 76 trillion, or 40% of global financial assets at the end of 2013. In relation to GDP, while assets of global top 500 asset managers have been stable at around 100% of world GDP, the role of investment funds in advanced economies<sup>27</sup> has substantially risen between 2002 and 2012, from 60% to 90% of GDP of the country group. Growth was particularly strong among investment funds, with assets managed increasing by 70% to EUR 9.4 trillion by end-2014 (ECB, 2015a). The role of investment funds has particularly expanded in fixed-income bond markets, and bond funds have potentially a very large market impact (IMF, 2015; ECB, 2015a).

<sup>27</sup> The selected advanced economies taken into account by IMF (2015) are Canada, Germany, Ireland, Japan, Luxembourg, the United Kingdom and the United States. Investment funds include mutual funds, money market funds and exchange-traded funds.

Chart 8

### Aggregated balance sheet of euro area investment funds



There are many different types of asset managers. On the asset side, the focus of asset managers can be on short-term money market instruments, on various types of bonds, on equities, commodities, derivatives, or less liquid forms of assets such as private equity, venture capital or private debt (see chart 8). On the liabilities side, funds usually issue shares to customers, which implies that investment risk lies with shareholders. However, there are also funds with some or considerable leverage (e.g. hedge funds).

Many open-end investment funds face liquidity risk: their customers can sell back their shares at any time without notice. This may particularly happen during periods of market stress but also when expectations are being adjusted abruptly and by many investors at the same time. A fund manager can either cover fund outflows from cash reserves or sell assets (if leverage is not considered or excluded). This implies the risk that in periods of financial market stress or crisis, funds may experi-

ence “runs” and be forced to shed assets quickly and in large volumes (“fire sales”). Given the size of large funds relative to the size of some markets (e.g. emerging market bonds and corporate bonds), their asset transactions may influence market pricing already in normal times; this may be aggravated in periods of market distress, when liquidity dries up. These properties and their potential consequences for financial stability have already been recognized by financial supervisors (see e.g. IMF, 2015; ECB, 2015a).

What does this imply in the current period of ultra-easy monetary policies? First, fund managers may want to explore potentially unutilized avenues to optimize the risk-return properties of their portfolios. For instance, they may aim to harvest various market and alternative risk premiums in a balanced way. They may try to exploit past empirical patterns supporting certain “investment styles” or combinations thereof. The risk of a sudden bond yield reversal may, according to past experi-

ence, be easier to manage with combined portfolios of long and short positions (Ilmanen, 2015).

Portfolio management may be complicated by changed post-crisis market behavior: For example, the IMF (2015) shows that in the post-crisis period since 2010, the correlation between various asset classes has markedly increased. Cross-asset correlation is further heightened during periods of high volatility. This renders risk management through portfolio diversification less effective. Furthermore, the causal direction of spillover effects between global bond market yields has sharply changed since first indications of large-scale asset purchases by the Eurosystem. It is now more likely that changes in the 10-year German bund rate precede changes in the 10-year Treasury rate (IMF, 2015).

Second, ultra-low interest rates may trigger a search for yield. Incentive structures of fund managers encourage search for yield: as fund performance is regularly and publicly compared, managers may try to meet demanding customer expectations by taking more risk. This behavior tends to be combined with herding behavior, as portfolio managers tend to orient their portfolio decisions towards benchmarks. The resulting compression of risk premiums, while generating valuation gains in the short term, results in lower returns (at a given risk) for the future and furthermore carries the risk of subsequent yield and price corrections.

Third, search for yield also may prompt investment in less liquid assets, exacerbating the aforementioned liquidity mismatch. There are limits to such developments, though, as

asset managers are restricted by their mandate.

Finally, if a scenario of lower investment returns across all or most asset classes for the medium to long-term future turns out to be realized, then asset management fees might be squeezed, since they would no longer be covered or justified by returns.<sup>28</sup> This could in turn ultimately have repercussions on asset management strategies towards low-cost styles such as passive management, index funds, synthetic portfolios, which in turn increases herd behavior. It could also affect the marketing channels and methods for investment products, with increasing use of internet banking and brokerage, personal expert advice being available to customers from a certain investment volume only or being charged separately.

Supervisors and international organizations have been increasingly pointing to financial stability risks potentially arising from the “shadow banking sector” (IMF, 2014b, 2015; ECB, 2015a). However, contrary to the insurance sector, the consequences from ultra-low interest rates have so far not been the focus of concerns. This may change in the future, as several of the risks addressed from a (systemic) financial stability perspective might become relevant in the event of a sharp reversal in interest rates, stock and other asset prices. As pointed out by the IMF (2015) and ECB (2015a), large and/or concentrated mutual fund bond holdings appear to exacerbate bond spread reactions during periods of market stress, as funds suffer from runs and are forced into fire sales to meet customer redemptions or by themselves adjust portfolio holdings to contain losses in

<sup>28</sup> *The performance of an asset manager depends on relative returns; retail investors in particular might, however, question whether investing in funds makes sense.*



stressed markets. While the IMF presents evidence for this for corporate and emerging market bonds, the same can happen in euro area sovereign bonds, particularly those of smaller and more vulnerable states. Due to various linkages to banks and insurance firms, shocks to the shadow banking sector may also affect banks' refinancing costs and insurance firms' portfolio performance, with nonnegligible repercussions for the real economy.

## 5 Summary and conclusions

We have shown in this paper that ultra-low interest rates affect different types of financial institutions differently. This is due to differences in balance sheet structure, in particular the relative duration of assets and liabilities. If assets tend to exhibit a longer duration than liabilities, as in the case of banks, low interest rates can initially be an advantage. However, there is evidence that in the longer term also banks suffer from low interest rates. This arises from interest rate margin compression, because low interest rates tend to go hand in hand with a flattening of the yield curve (particularly if deposit rates hit the zero lower bound), reducing the income from banks' maturity transformation. By contrast, in the case of life insurers and pension funds, the duration of liabilities usually exceeds the duration of assets. Therefore, a drop in interest rates is a direct disadvantage for these institutions, as the net present value of liabilities rises by more than that of assets; the negative effect is amplified if insurers have granted minimum returns on liabilities, as was the case with life insurers in the past in several countries.

We have further argued that the further course of nominal and real interest rates crucially depends on the future development of the macroecon-

omy over the business cycle and in a long-term structural perspective. A further fall in long-term interest rates and a further rise in asset valuations would in the short term imply further asset valuation gains. However, this comes at the cost of lower future returns (e.g. lower interest on banks' new loans, lower yields on institutional investors' reinvestment of maturing bonds). Finally, it involves the risk of asset valuation losses for the future if and when interest rates rise and asset valuations are corrected downwards. A taste of this last phase was given in early May and June 2015, when stock and bond markets suffered marked price corrections. Thus, ultra-easy monetary policy may risk to create financial sector and market exuberance as long as the tailwinds of falling interest rates and rising asset prices goes on. They must not conceal needed adjustments in business practices and models. Once yields have reached their floor, financial institutions and investors must get acquainted with ultra-low returns and must heed against the risks from an eventual rise in interest rates. Thus, within overall medium to long-term corporate strategies on business models, asset-liability management must seek to make the transition through the various interest rate phases smooth and the incidence of different future scenarios manageable. Both liquidity and solvency risks need to be carefully considered. The possibility of systemic events, e.g. as a consequence of sudden swings in economic or interest rate expectations, which might also result in liquidity dry-ups in certain market segments, should be carefully evaluated and provided for.

Against this background, it is not surprising that risks from a protracted period of ultra-low interest rates have been gaining regulatory attention. Super-

visors and the major international financial institutions have conducted scenario analyses and stress tests. Their attempts to quantify the impact of future interest and asset price shocks confirm that ultra-low interest rates entail substantial systemic risks, with nonnegligible potential repercussions on the real economy. While some measures are starting to be discussed or taken, further regulatory and macroprudential action may be required to contain these risks. At the same time, awareness is also increasing that regulation itself may become the source of some of the relevant risk channels (e.g. increased risk of liquidity dry-ups due to a reduced role of banks as market makers; see e.g. IMF, 2015). Since the outbreak of the financial crisis plenty of new requirements that financial institutions need to fulfill were introduced and the mandate of regulators and authorities was extended. Even though measures were not directly aimed at tackling the low interest rate environment, the regulatory toolkit nowadays offers many possibilities to address

these issues. Stress tests allow identifying potential problems from a protracted period of low interest rates but also of a return of interest rates to higher levels. Macroprudential measures can be employed to curtail specific problems in specific sectors. It also becomes more and more obvious that monetary policy, macroprudential and microprudential regulation and supervision should be conceived in a more closely integrated manner to achieve desired policy outcomes as effectively as possible and avoid cost and risks as best as possible. This might help to achieve macroeconomic stabilization goals while at the same time safeguarding financial stability. Finally, the article may also be seen as a case study on how policymakers need to understand the challenges, incentives and restrictions faced by financial sector actors (in this case asset-liability managers), while at the same time successful asset-liability management requires a deep understanding of the motivations and concerns guiding future policy action.

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Event wrap-ups and miscellaneous

# Long-Term Perspectives for Economic Growth – summary of the OeNB's 43<sup>rd</sup> Economics Conference

Doris Prammer,  
Helmut Stix<sup>1</sup>

Eight years after the crisis began, many euro area countries still report low economic growth and high unemployment. While euro area monetary policy has cut interest rates to close to zero and has taken a variety of unconventional measures to support the economy, the full effects of these measures are yet to be seen. At the beginning of the crisis, expansionary fiscal policy helped provide impetus to growth. Later on, consolidation efforts were increased with the aim of reducing the high levels of public debt and restoring the sustainability of public finances. However, fiscal policy seems to have reached its limits in many countries, with more expansionary fiscal policies widely considered a threat to debt sustainability and sovereign creditworthiness. The European Union has embarked upon a number of ambitious structural reform programs but implementation seems hesitant and unconvincing in many countries. While financial sector risk-taking has regained momentum, low investment and high unemployment continue to challenge the real economy. Why is the economy recovering so slowly or, in some cases, not at all? Has the crisis reduced the long-run growth potential? And if so, by how much? How far below potential are current growth rates? Is the EU facing a period of secular stagnation?

These questions were discussed at the 43<sup>rd</sup> OeNB's Economics Conference which took place on June 15 and 16, 2015. The contributions of the conference speakers, comprising of renowned

economic policy experts, academics, politicians, central bankers and managers, are summarized in this article.

In his opening remarks, OeNB Governor *Ewald Nowotny* quoted John Maynard Keynes, who in 1930 had noted growing economic pessimism and a surge in expectations that economic progress would slow down. In reference to this quote, Nowotny raised the question whether we find ourselves in a similar situation today and whether pessimism regarding our growth prospects is justified – or whether “this interpretation is widely mistaken,” as Keynes concluded almost a century ago.

On the basis of a comparative discussion of the long-run growth performance of the United States and Austria, Nowotny pointed to the strong downward deviation of growth in both economies after the onset of the Great Recession in 2007, which can be interpreted in two ways. In one view, it constitutes a longer-term deviation from the trend, which will revert eventually – although a return to the trend would require closing a substantial output gap of almost 15% of GDP. A second view maintains that the Great Recession has marked the beginning of a new era of lower long-term growth rates. These are, in a nutshell, the two views that characterized the topic of this year's Economics Conference.

Nowotny pointed out that it is highly speculative, albeit very interesting, to make predictions about economic developments that reach way into the future. What are the drivers of long-

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run growth, according to the standard growth model? First, demographic developments are expected to have a considerable impact on future macro-economic growth. Decreasing fertility rates, on the one hand, will have a direct negative impact on GDP growth if not counteracted by higher rates of net migration. Population aging, on the other hand, might lead to higher savings and thus – *ceteris paribus* – to a downward pressure on real interest rates. The strength of this effect is sometimes presented as a direct and necessary consequence of the rise in life expectancy. It is important, however, to emphasize that it will also depend on retirement behavior, and this aspect is not easy to forecast as retirement behavior will depend on the design of public and private pension systems, on the economic environment and on the progress of medical science.

The second main driver of long-term economic growth is productivity. A number of observers have argued that the technological frontier is no longer expanding at the previous speed and that the wider consequences of the computer/Internet revolution are more modest than those of previous revolutionary technologies like the steam engine or electricity. Opposed to this rather pessimistic view of future innovation, there is a second camp of thought that advocates more optimistic perspectives of future technological possibilities, including scientific breakthroughs especially in the life sciences.

The reasons for the modest growth performance recorded over the past few years cannot only be seen in long-term factors. The recent debate has provided several explanations, of which the secular stagnation hypothesis, which dates back to Harvard economist Alvin Hansen, is of particular prominence. He viewed the weak recovery in

the aftermath of the Great Depression as being caused by excess savings – with the deeper cause of a very unequal distribution of wealth – and a real interest rate that could not fall sufficiently to balance supply and demand at full employment.

Today's proponents of Hansen's hypothesis, e.g. Harvard economist Larry Summers, consider this mechanism to be the main driving force behind a secular deficiency in aggregate demand in the aftermath of the Great Recession. According to this view, long-term factors can be considerably amplified by a number of specific characteristics of post-crisis recovery processes. The first characteristic is the zero lower bound on nominal interest rates. If, in such a scenario, inflation expectations are well anchored, the real interest rate will be stuck at an excessive level. As a consequence, we might see low investment and high unemployment. A second characteristic of the current recovery process is the phenomenon of a debt overhang, comprising household, corporate and public debt. A number of observers have identified the debt overhang as an aggravating factor for growth. Finally, the weak recovery may at least in part be due to the increased degree of uncertainty surrounding future economic developments. This uncertainty prompts households to step up precautionary saving and firms to postpone investments, which further enhances excess saving and thus exacerbates the deficiency in aggregate demand.

Nowotny concluded by discussing some monetary policy implications of the recent debate. What can and should central banks do to sustain long-run growth and support economic recovery? On the one hand, monetary policy plays a vital role in managing demand fluctuations and in stabilizing prices,

output and unemployment – even at the zero lower bound. Quantitative easing (QE) has contributed significantly to economic recovery in the United States, and there are first signs of success of QE measures also in the euro area. On the other hand, monetary policy is less effective when it comes to improving a country's long-term growth potential. Structural policies, institutions, research and development (R&D) play more important roles in this context. But this is not to say that monetary policy is irrelevant for long-term growth. In fact, economic performance requires a growth-friendly environment. Monetary policy contributes to such an environment by ensuring a reliable policy framework, a sound financial system, a well-functioning banking system and macroprudential policies that prevent excessive price fluctuations.

State Secretary *Sonja Steßl* began her opening address by confirming the timeliness and high economic policy relevance of the conference topic. Her contribution touched upon three issues: (1) why economic growth is essential for our societies and why growth is a priority of economic policy; (2) which growth model should be our priority; and finally, (3) how policymakers can contribute to such a framework.

There is a broad consensus among leading economists about why economic growth is essential: unemployment represents a waste of resources and involves severe personal costs to those affected and hence has to be avoided. Moreover, it can cause political instability.

With regard to growth models, Steßl noted that we should aim for smart, sustainable and inclusive growth as defined in the EU's "Europe 2020" growth strategy, which envisages a more efficient use of natural resources,

knowledge- and innovation-based growth and a full-employment economy delivering social cohesion. Adding to this list, Steßl emphasized social inclusion as a key policy goal. Referring to some European countries including Austria, she noted that it is not smart to maintain an educational system that excludes a considerable proportion of young people from access to better education and to accept that whether young people earn educational degrees depends more strongly on their parents' degrees than in most other countries. Instead, she called for a more comprehensive approach to schooling that allows for developing individual abilities, which would, in turn, increase the innovative capacity of our economy.

With regard to the possible contribution of policymakers, Steßl referred to the three pillars mentioned in the European Commission's 2015 Annual Growth Survey (AGS): investment, structural reforms and fiscal responsibility – important areas that definitely contribute to boosting growth in Europe. However, in her view, the AGS misses to list inclusiveness as an important goal. With respect to the only reference to social inclusion in the AGS – "welfare systems should play their role to combat poverty and foster social inclusion" – Steßl expressed her concerns that the fiscal adjustments demanded by the EU will hit those at risk of poverty, who do not have a strong lobby for defending social transfers. In this context, she explored how fiscal responsibility could help improve long-term growth perspectives. A more active fiscal policy could increase aggregate demand in a time when the private sector in most countries is trying to reduce its debt overhang. In such a case, the public sector should use fiscal policy to restart growth. According to Steßl, it is



unfortunate that those with room for fiscal maneuver are focused on raising debt levels. We face a coordination problem among governments. While policy coordination is a key topic at the EU level, it rarely refers to fiscal policy spillovers from other countries. Steßl concluded by mentioning the fiscal stimulus of the planned tax reform in Austria, which will increase disposable income as a much needed boost for demand.

### Restarting growth might require new strategies

Session 1 on “Restarting Growth: Perspectives for the Euro Area” was chaired by OeNB Vice Governor *Andreas Ittner*.

*André Sapir*, Senior Fellow at Bruegel, a European think tank, elaborated on “Reviving Growth in the Eurozone: Demand Management or Structural Reform Policy?” Sapir started by discussing the euro area growth puzzle. He put forth the two opposing views that explain the weak growth performance in the euro area: The first view focuses on structural rigidities, maintaining that the slow growth in the euro area is caused by supply-side problems and that structural reforms would accelerate growth. The second view argues that demand management, i.e. the imposition of austerity policies on the peripheral euro area countries and of budgetary restrictions on all other euro area countries, has been dramatically wrong since the beginning of the sovereign debt crisis.

After having discussed both views in detail, Sapir concluded that this puzzle can be explained by both structural and crisis (rather than simple demand) management factors. In particular if considered over a longer period, the U.S.A. has recorded a better growth performance (even before the Great Recession), while euro area growth has

demonstrated substantial heterogeneity. Sapir pointed out that the core euro area countries’ growth performance was not far behind that of the U.S.A. in 2007 but fell back thereafter.

These heterogeneities call for a dual approach. Some euro area countries are adversely affected by structural rigidities that require supply-side reforms. The euro area economic management framework in general is deficient and requires governing reforms.

Sapir listed three issues that, in his opinion, were wrong with “EMU 1.0:” (1) the impact of financial integration had been underestimated and consequences for financial stability had been ignored, (2) the nature of EMU sovereign debt had been ignored and (3) the loss of the exchange rate instrument had not been compensated. Sapir raised the view that the Single Supervisory Mechanism and the Single Resolution Mechanism (“EMU 2.0”) provide only a partial answer to these challenges. Based on this institutional environment, “EMU 3.0” would need a better enforcement of fiscal rules to reduce debt levels, to eventually introduce eurobonds or eurobills, to replace the European Stability Mechanism by a “European Monetary Funds” that includes a sovereign debt restructuring mechanism and to limit banks’ exposure to sovereign debt. The remaining problem is that macroeconomic adjustment mechanisms have not been imposed. Sapir pointed to the importance of labor market and fiscal adjustment mechanisms in particular. With regard to labor market adjustment mechanisms, he noted that a fully integrated euro area labor market is not feasible and proposed to establish a “Eurosystem Competitiveness Council,” which should give guidance about the appropriate wages given productivity developments. With regard to fiscal adjust-

ment mechanisms, he emphasized the importance of a coordination of fiscal policies for debt sustainability.

On a general note, Sapir stressed that while the findings on how to stimulate growth from one decade ago are still valid, the related challenges have become more acute. At the same time, the euro area's capacity to deal with current challenges, according to Sapir, has been reduced because (1) the state of public finances is fairly dismal, (2) the population is aging and (3) the crisis has focused political capital on short-term issues.

*Karl Aiginger*, Director of the Austrian Institute of Economic Research (WIFO), discussed the findings of an international research project carried out by WIFO in collaboration with a number of other European economic research institutes: "Perspectives Based on WWWforEurope" (with "WWW" denoting "welfare, wealth and work").

What kind of development strategy should Europe opt for in the face of the financial and economic crisis and challenges like globalization, demographic shifts, climate change and new technologies? What kind of strategy will guarantee welfare, wealth and work for Europe in the long term? Aiginger started by noting that he would express a rather optimistic view, even though economic growth will decelerate in the rich countries. In his words, Europe is a success model which, however, has now reached its "mid-life crisis."

He outlined his vision of an economic framework that envisages a substantial change in economic concepts. The implementation of this framework would establish Europe as a role model until 2050. Having a coherent and comprehensive plan for this economic framework is important as Europe has always been at its best when pursuing a long-run goal.

Specifically, a two-stage strategy is needed for Europe to cope with lower growth rates. The first stage – consolidation and reprogramming – entails a return to normal employment rates, a reduction of disequilibria across countries/regions and the achievement of a sustainable position in debt and sustainable pension systems. Europe needs a growth of 2% or more to solve the debt problem, to reduce unemployment and to resolve disequilibria across countries. Once this has been achieved, the second stage will begin, characterized by the transition to a low growth/high welfare regime, the reduction of the dependence of employment on growth, an increase of the welfare content of (lower) growth rates and of labor market opportunities for young people, and an encompassing socio-ecological transformation of the rich countries, i.e. a radical decoupling of material and energy from output. Such a transition to higher welfare (despite lower growth) would entail full employment and a more equal distribution of life chances. The drivers of growth would be innovation and education. What we should aim at is an "enlightened version of cost competitiveness" with a focus on competitive advantage which, according to Aiginger, lies in quality, sophisticated products and the use of technology.

Aiginger stressed that the transition to a low growth/high welfare regime would require changing our mind sets. First, we would have to move away from our focus on mere GDP figures – social empowerment, ecological excellence and trust should also be objectives. Aiginger noted that rather than viewing growth as an objective, we should view it as an instrument to create welfare, employment and sustainability.

As current policies sometimes tend to go into the wrong direction, a reality check is sobering, Aiginger said. Al-

though the changes envisaged in the first stage of this strategy would be very urgent, they are also very unlikely to happen; currently, progressive proposals are neither included in OECD country reviews nor in the EU's recommendations.

Aiginger presented a comprehensive set of concrete policy proposals for consolidation and reprogramming, touching upon tax policy, public investment and supply-side policies. He advocated a “silver bullet strategy” that provides for the exemption from the upper deficit limit of labor-intensive investments in intangibles (e.g. R&D, information technology, energy efficiency, renewables, energy and broadband grids, early childhood investment, retraining). These exemptions should only be granted for the years 2015 and 2016 and only if expenditures are made in addition to existing spending plans. Moreover, these investments should be confined to “growth drivers” and should be subject to scrutiny by an international authority (e.g. another country's court of audit).

### **Structural reforms needed to support long-term growth**

Session 2 on “Long-Run Growth, Monetary Policy and the Financing of the Economy” was chaired by OeNB Executive Director *Peter Mooslechner*.

The first speaker, *Peter Praet*, Member of the Executive Board of the European Central Bank, discussed “Structural Reforms and Long-Term Growth in the Euro Area.” He started out by stating that five year-ahead growth expectations have continuously deteriorated since 2001 and that actual GDP growth is far below the potential output level that could have been expected prior to 2007.

Against this background, the strong need for a comprehensive policy re-

sponse is obvious. Monetary policy can play a role in supporting long-term growth. First, by fulfilling its mandate, i.e. guaranteeing price stability, the ECB reduces uncertainty about the future price level, which supports investment and efficient resource allocation. Second, by reducing fluctuations in the business cycle, it can help forestall hysteresis effects, e.g. a permanently lower GDP level or weaker GDP growth after recessions. Third, monetary policy might contribute to GDP growth by ensuring financial stability: tempering financial cycles helps avoid credit excesses, which always entail resource misallocations.

While monetary policy is playing its part, for many euro area countries the implementation of structural reforms is central to higher long-run growth. Specifically, it is of utmost importance to increase the euro area countries' shock adjustment capacity and to raise the economy's supply capacity. Structural reforms are critical to an efficient implementation of monetary policy and, over time, the integrity of monetary union. The implementation of structural reform should take country-specifics into account – there is no “one-size-fits-all” model. What matters is that the combination of policies and institutions within each country produces an outcome that is satisfactory for its citizens and sustainable for the euro area as a whole.

To illustrate his reasoning about the importance of increasing adjustment capacity, Praet referred to the labor market. Ensuring that wages can respond to changes in labor demand or supply is seen as a key element in limiting the employment cost of shocks. There are different ways how a country can deal with shocks that depend on the prevailing labor market institutions. It is important to recognize that coun-

tries characterized by a more flexible reaction to the current crisis, e.g. countries which allowed wages to adjust to productivity developments, were more successful. What is thus needed is a framework that takes into account both how countries differ in terms of their national peculiarities, and how they are similar by virtue of being in a monetary union. Within this framework, there are various combinations of country-specific institutions that can produce smooth adjustments.

Structural reforms also contribute to long-run growth by increasing the supply capacity of the economy. Its importance arises because all euro area economies need to be able to sustain high levels of growth and employment for monetary union to be cohesive over the long-term, against the background of absent large-scale fiscal transfers and limited labor mobility across countries. Structural reforms can play an important role in addressing the challenges related to each production factor. As one example, Praet highlighted total factor productivity (TFP) growth as a critical factor and discussed the euro area's weaker TFP performance relative to the U.S.A. Firms in the U.S.A. have invested more in computer and telecommunication technology and have been more efficient in turning that investment into productivity gains. In part, this depends on structural factors: in the euro area, for instance, firms are smaller than in the U.S.A., which could partly be due to the regulatory environment.

Praet concluded by emphasizing that the quality of governance and institutions is key to a successful promotion of growth. Structural reforms need to be country specific, but regardless of the chosen policy, it is important that political choices are comprehensive, coherent across countries, consistent and credible.

*Anne Bucher*, Director at the European Commission, spoke about "Investing in Europe." She noted that the European Commission is now more optimistic about GDP growth than it used to be in the past. This might partly be due to beneficial circumstances, like exchange rate developments and the reduction in energy prices. However, the medium-term economic outlook remains sobering. TFP, labor and capital show very weak dynamics. The key policy message that follows is that the EU's macroeconomic policy stance is broadly appropriate at the current juncture, but it offers no long-term solution. The European economy needs urgent modernization through a renewed commitment to reform and enhanced investment.

With respect to structural reforms, Bucher attested some success in vulnerable EU countries, in particular for labor markets. More is still needed to improve the functioning and flexibility of product markets. Less progress has been made in the core countries; in particular, product market reforms are needed to improve competition and strengthen domestic demand. Such reforms could bring about potentially large GDP effects: if each Member State was able to close half of its gap vis-à-vis the best performers, EU GDP would be 6.5% higher in ten years' time, relative to a situation where the gap was not closed.

With regard to enhanced investment, Bucher discussed the Investment Plan for Europe (also known as the "Juncker Plan"), which relies on the presumption that governments' fiscal space is limited and that there is a need to crowd in private investment. The many reasons why investment is low have been extensively discussed. Now there is a need for a comprehensive approach and a need to act at the EU level

as financial markets are still fragmented and large (and in particular cross-border) projects might not be realized because of various market failures. Apart from the financing issue, the EU's comprehensive Investment Plan for Europe also encompasses the improving the investment environment e.g. via the removal of nonfinancial regulatory barriers and the safeguarding of an investment-friendly regulatory environment. The EU has gone far in harmonizing Single Market legislation, but its implementation is still lagging behind in many areas.

### **Potential growth requires investment and appropriate framework policies**

Session 3 on “Potential Growth: Drivers and Impediments” was chaired by *Ernest Gnan*, Head of the OeNB's Economic Analysis Division.

The first presentation in this session, on “Perspectives on Potential Output after the Global Financial Crisis,” was given by *Thomas Helbling*, Division Chief at the International Monetary Fund (IMF). Helbling observed that there has been a general deceleration in potential output in major economies since 2008, that potential output growth has been persistently lower since the crisis and that potential output growth is likely to remain below pre-crisis rates for some time.

Specifically, the global growth projection of the IMF's World Economic Outlook of 4% in 2020 is disappointing when measured by the standards of the 1990s and 2000s. Also, there are continued downward revisions in the short- and medium-term growth projections. According to Helbling, three big questions need to be discussed in this context: First, has the global financial crisis affected potential output? Second, what are the effects of slowing popula-

tion growth and population aging on potential output? Third, when did the recent productivity slowdown start?

According to new IMF estimates, potential output growth in the advanced economies started to slow already before the global financial crisis. In emerging economies, it increased before the crisis but has declined thereafter.

What damage has the financial crisis caused to potential output? First, investment went down after crisis. According to Helbling it could be argued that with higher intermediation costs there can be long-lasting effects, potentially. Second, hysteresis in labor markets, higher structural unemployment, frictions in sectoral reallocation and changes in participation rates can have effects on potential output. Third, total factor productivity (TFP) could have declined as R&D and learning-by-doing decreased. However, the crisis could also have led to a “cleansing” effect, fostering creative destruction and thereby producing a positive effect on TFP.

Trying to disentangle the contribution of each individual factor to growth, Helbling presented empirical evidence that shows that capital growth, potential employment growth and TFP growth have all negatively contributed to the overall growth potential. Much of the damage to trend employment, however, is not crisis-related but rather due to slower working age population growth and continued population aging. He then referred to simulations showing that in advanced economies, capital growth is likely to remain at below pre-crisis rates and that trend employment growth is expected to fall. The implication of these trends is that in advanced economies there is only a modest recovery of potential output growth, mostly due to TFP recovery.

Against the background of these results, Helbling concluded that the

increase of potential output should be a key policy priority. In advanced economies, such policies could entail demand support to tackle weak investment and structural unemployment as well as policies and reforms to boost productivity, infrastructure capital and labor supply. In emerging economies, key policy steps are policies and reforms directed at removing critical bottlenecks, improving business conditions and education.

“The Future of Growth: Some Ideas” was the title of the presentation by *Giuseppe Nicoletti*, Head of Division at the Organisation for Economic Co-operation and Development (OECD). In line with previous speakers, Nicoletti saw structural reasons behind a future decline or stagnation of growth in most G-20 countries. The crisis also left a legacy, however, because it hit potential output mainly via lower investment and productivity. Using a production function approach, the average loss in OECD countries due to the crisis is about 4%. Largely in line with the previous speaker, Nicoletti pointed out that the decomposition of this effect shows that the damage mainly comes from capital per worker and lower productivity.

Nicoletti highlighted that low investment poses a problem and that the sources of investment weakness are heterogeneous across countries. Current investment-to-GDP ratios are below what is needed to resume pre-crisis potential growth. The low capital deepening, in particular for knowledge-based capital, does not bode well for future productivity growth. Investigating this further, Nicoletti referred to the development of productivity of frontier firms and lagging firms, showing that firms at the global frontier continue to grow despite the aggregate slowdown. However, the gap between

frontier and laggards rises, especially for services. Resuming aggregate growth would require reviving the diffusion of new technologies. Inefficiencies in the allocation of resources are seen as another problematic issue. For example, a skill mismatch constrains innovative firms' ability to attract skilled workers and grow. The gains to labor productivity from removing skill mismatches are quite substantial.

Finally, Nicoletti elaborated on what policymakers can do to support growth. To increase resilience and sustain the growth potential, it is essential to reduce financial vulnerability and to improve structural conditions. To boost productivity, diffusion and growth, he referred to framework policies which can promote experimentation and efficient resource reallocation. As examples, Nicoletti mentioned a less stringent, or more harmonized, product market regulation (particularly in services), lighter employment protection regulations, easier access to risk capital, a bankruptcy legislation that does not excessively penalize failure, and housing policies that do not impair labor mobility. Another important area for action would be innovation policies. In this context, Nicoletti pointed to basic research, which has larger knowledge spillovers than applied research, to R&D tax incentives that do not excessively favor incumbents, and to R&D collaboration between businesses and universities.

### **Debt overhang as a strain on growth – how to deal with it?**

Session 4 on “Debt Overhang as a Drag on Growth” was chaired by *Martin Summer*, Head of the OeNB's Economic Studies Division.

*Juan F. Jimeno*, Division Head at the Banco de España, elaborated on how the interaction between the legacy of

the crisis (debt buildup) and structural changes (decline of productivity and population growth) gives rise to a long period of subdued growth and high unemployment. To analyze these interactions, he used a three-generation overlapping-generation (OLG) model, a version of Eggertsson and Mehrotra's (2014) model extended to include public debt and exogenous technical progress. In this model, a deleveraging shock has long-lasting effects through individual saving decisions. As the savings rate increases, the natural interest rate falls, possibly below zero. He then presented some insights derived from the model extension, in particular the finding that as population growth declines, the natural interest rate falls further since there are less young people demanding credit. Another channel by which the natural interest rate decreases in the model is lower productivity growth. Decreased natural interest rates are the result of increased individual savings, which are necessary to keep up pension replacement rates in response to decreased productivity growth. Jimeno displayed the expected changes in replacement rates in three different scenarios, all indicating that replacement rates will decrease by 10% to 15% on average. If the natural interest rate decreases and if monetary policy is unwilling or unable to increase inflation (expectations), the zero lower bound on policy interest rates is binding and unemployment rises. Hence, the combination of high debt (which requires deleveraging) and low population and productivity growth pushes monetary policy into the zero lower bound and may lead the economy into a long period of high unemployment. Referring to the relevant literature, Jimeno concluded that the economic order of the western world was undergoing a structural change.

*Ugo Panizza*, Professor at the Graduate Institute of International and Development Studies, presented his view of the link between public debt and long-term economic growth and suggested a policy agenda for countries facing high public debt. According to theoretical literature, high public debt may affect growth via two channels. The first channel, which Panizza also referred to as the “debt fairy,” identifies negative growth effects of public debt through crowding out and future tax distortions. However, the negative growth effects of crowding out and tax distortions are likely to be small. According to the second channel, the confidence channel, high debt levels impact on growth due to uncertainty and the rollover risk (and finally debt default). However, the debt limits at which debt starts to have a negative impact on growth vary across countries. Empirically, there seems to be a negative correlation between the level of debt and growth. This finding, however, masks heterogeneity between countries and does not imply any causality. Panizza stressed that, moreover, the definition of debt is not clear cut because it might be measured as gross debt, net debt (gross debt minus assets) or total debt (including implicit debt, such as future pension obligations). In addition, debt ratios and debt forecasts used for empirical investigations are subject to major revisions.

In a thought experiment Panizza, assumed a sudden hike in a country's public debt in an environment of extremely low interest rates and huge public infrastructure gaps, and considered the optimal policy response to this debt. In case costs only consist of future tax distortions, a fast reduction of debt would not be a good policy response, as it would only amplify distortions. If costs are associated with the rollover

risk, debt should be reduced quickly. However, we neither know the best way to reduce debt nor the possible trade-offs, and large and persistent primary surpluses might not be feasible.

### **Kamingespräch: Austria's economic position in the EU is favorable, despite remaining challenges**

The first conference day was closed by the traditional Kamingespräch with the Austrian Federal Minister of Finance, *Hans Jörg Schelling*. Schelling emphasized the importance of the Austrian tax reform, which will enter into force in 2016 and is intended to stimulate the growth perspectives for the next few years. At the same time, respecting European fiscal requirements such as the Maastricht deficit limit or the public debt limit and keeping the medium-term objective of a structurally balanced budget of 0.45% of GDP is of utmost importance. As Austria is currently losing ground compared with other EU countries – albeit from a high level – not only budget consolidation but also structural reforms are key for granting future generations the same standard of living. In addition to the tax reform, Schelling identified the following reform areas: (1) Austria's complex federal system, which has been repeatedly criticized as expensive and inefficient, (2) the pension system, (3) the labor market, and (4) the education system. While progress has been made in some of these areas, Schelling was concerned by the limited amount of money disposable to invest in the future due to promises given in the past. Hence, public investment and investment incentives are important; a first step toward investment incentives has been taken by increasing the R&D premium from 10% to 12% with the 2016 tax reform. Challenges stemming from the Aus-

trian banking sector have been dealt with, but room for improvement remains. Raising the profitability of Austrian banks seems a particular necessity, Schelling noted. Nevertheless, he considers Austria's economic position in the EU comparatively favorable.

The ensuing discussion centered on the capital union, the situation in Greece, the international fight against tax fraud and aggressive tax planning, the introduction of a financial transaction tax as well as the European Fund for Strategic Investment as the most pressing issues from an EU perspective. Schelling supports the capital union provided that Austrian SMEs benefit from it. Negotiations on this issue are still ongoing. In addition to reviewing some legal prerequisites and potential economic consequences of Greece leaving the euro area, Schelling pointed to related geopolitical issues – such as Greece's importance as an EU NATO member, the possibility of an alliance between Russia and Greece, an increase in China's influence on the EU and the rise of Turkey as a regional power.

### **Investment, in particular in health and education, is key in dealing with population aging and low economic growth**

OeNB Executive Director *Kurt Pribil* opened the second conference day with session 5 on “Demography, Labor Markets, Investment and Growth.”

*Alexia Fürnkranz-Prskawetz*, Professor at the Vienna University of Technology (TU Wien), gave an overview of the link between population aging and economic growth. Demography has long been included in theoretical neoclassical growth models and convergence models but only since the late 1990s the impact of changes in population age structure on economic growth have been taken into account. The signifi-



cance of population age structure for economic productivity has its theoretical foundations in (1) the life cycle model of savings and investment and (2) the age-specific variations in labor productivity. Literature refers to a demographic burden if population growth exceeds the growth of the working age population and to a demographic dividend in the opposite case. Fürnkranz-Prskawetz cited the East Asian growth miracle, where the demographic dividend amounts to as much as one-third of its economic miracle. However, the materialization of such a demographic dividend critically depends on policy areas such as public health, family planning, education, policies that promote labor market flexibility, etc.

Undoubtedly, Europe is aging. But the aging process and its consequences are very different across Europe. In countries that experienced a strong baby boom, the ensuing baby bust was relatively weak. These countries will experience a strong increase in the population share of elderly persons. In countries where the baby boom was weak, the baby bust was strong. These countries will experience a strong decrease in the labor force. However, population aging per se might not pose a problem to the economy, as it is not the demographic dependency ratio, but rather the economic dependency ratio – the ratio of nonworking population to working population – that matters for economic activity. Fürnkranz-Prskawetz stressed that model-inherent behavioral effects of aging – such as longer working lives, higher savings due to higher life expectancy, or higher female labor force participation due to lower fertility rates – cannot be observed in practice, however. This might impact on budget deficits, the ratio of capital and educational investment to

social security investment and households' ability to pay taxes, and it might have different welfare consequences for young and old households – all of which has an impact on economic growth. With reference to the relevant literature, Fürnkranz-Prskawetz concluded that the economics of aging is not about old age as such, but about health investment, educational investment at an early stage and the need to adapt to a new demographic situation.

*Wilhelm Molterer*, Vice-President of the European Investment Bank (EIB), discussed “The EU Growth Challenge and the Investment Plan for Europe.” In line with previous speakers, he pointed to the fact that the crisis has substantially reduced Europe's long-term growth potential estimates while U.S. potential growth seems to have recovered. Molterer considers the EU's competitiveness gap as the result of a wide range of shortfalls, such as the lack in investment for innovation and modernization and too little investment in human capital and infrastructure. Moreover, he misses an enabling environment to induce and support such investment and identifies a financing gap for such investment. This depressed investment is caused by structural impediments, a lack of confidence, public budget constraints and the low risk-bearing capacity in the system (of both banks and the public sector). According to Molterer, the Investment Plan for Europe tackles all these challenges by generating an environment conducive to investment. First, it supports structural reforms aimed at generating such an environment and it promotes European market integration; second, it provides public support via EIB activities and the European Fund for Strategic Investment (EFSI). The Investment Plan for Europe constitutes a concerted approach combining fiscal

sustainability, structural reforms and the EFSI focus on merit goods. The EFSI bundles EUR 21 billion EU level equity (supporting risk-absorbing financing volumes of around EUR 60 billion); with multipliers at work overall investment funds of more than EUR 300 billion should be available. Its goal is to foster investments that have spill-overs like R&D, skills, infrastructure with a focus on viable, smaller projects, thereby trying to avoid market distortion. Enhanced cooperation with the European Commission and national investment banks should help fostering investment as well as the EIB's decision to offer more capital-intensive higher risk-bearing financial products (providing a higher catalytic effect) and act – more than ever – as an advisory hub.

#### **Fiscal stimuli and adaption to changes as possible means to avoid secular stagnation**

The sixth and last session on “The Threat of Secular Stagnation and How to Avoid It” was chaired by *Doris Ritzberger-Grünwald*, Director of the OeNB's Economic Analysis and Research Department.

*Nicolas Crafts*, Professor at the University of Warwick, put the threatening prospect of secular stagnation in Europe into a historical perspective. He distinguished three, possibly related, concepts of secular stagnation. One short- to medium-term concept according to which the natural real interest rates are negative but at the zero lower bound and two medium- to long-term concepts: one according to which a very low natural rate of growth is coupled with adverse demographic developments and slow technological progress, the other characterized by persistent high unemployment because of demand shortfalls. He considered the euro area architecture not support-

ive to escaping from a “short-term secular stagnation at the zero lower bound,” as it is not well equipped to implement fiscal stimuli, supply-side policies that crowd in private spending and hence improve productivity, or (early) unconventional monetary stimuli.

Based on European Commission growth projections, Crafts identified a real risk of a long-run secular stagnation for some European countries. However, the U.S.A. as the historical leader reports positive growth prospects, which should allow the historical follower, Europe, to catch up. This is confirmed by the OECD's long-term growth and productivity projections, which are more positive than those by the European Commission. Crafts concluded that EU long-term secular stagnation may involve the potential problem of high unemployment and a lack of fiscal space rather than of low productivity growth. He pointed to evidence showing that Europe has not coped as well with skill-biased technological changes as the U.S.A. and considered Europe's handling of public debt (and high social transfers) as a serious challenge.

The last speaker was *Carl Christian von Weizsäcker*, Senior Research Fellow at the Max Planck Institute for Research on Collective Goods. In his contribution on “How to Avoid Secular Stagnation,” he demonstrated the excess of capital supply over capital demand and proposed policy reactions that would keep real interest rates from dropping to or below zero. Assuming adult consumption spread over 60 years and wage income over 40 years, he determined that an average savings rate of one-third of wage income (or ten years of consumption) would be necessary to allow for consumption in retirement. These savings can indeed be observed

in Germany if social security contributions and medical contributions are considered savings. Assuming that people wish to pass on some of their wealth, von Weizsäcker assumed that they would require funds to cover about 12 years of consumption; this is roughly true for all OECD countries and for China. At the same time, capital demand is below one-half of capital supply. Moreover, von Weizsäcker did not expect that further gains could be achieved from capital deepening; hence he did not expect an increase in capital demand, either. With future capital supply increasing due to the higher saving rates in an aging society, the excess supply of capital causes malinvestment leading to real interest rates at or below zero. According to von Weizsäcker, increases in public debt, for those countries that can afford them, could fill the gap between desired savings and the economically efficient productive capital stock. Government debt should be used for public investment programs, e.g. investment in the transport system or in a pre-school system that helps raise women's income and social status.

Von Weizsäcker closed his presentation by dwelling on the example of Germany. He pointed out that higher demand in Germany would induce higher demand in the euro area and thereby help stabilize both the euro and euro area. Thus, explicit German debt would reduce Germany's implicit debt of state guarantees to vulnerable countries. Higher growth in Germany would attract additional migration, thus causing higher private investment. Germany's demography would be improved by migration and the resulting higher birth rates. This improvement would result in a lower export surplus, which could put Europe in a better negotiation position in trade agreements with other countries.

### **Klaus Liebscher Award and Dr. Maria Schaumayer Scholarship**

In the course of the Economics Conference, OeNB President Raidl and OeNB Governor Nowotny presented the Klaus Liebscher Award, which was established on the occasion of the 65<sup>th</sup> birthday of former OeNB Governor Klaus Liebscher in recognition of his commitment to Austria's participation in Economic and Monetary Union and to European integration in general.

The two prize-winning papers in 2015 were "Sovereign Risk and Bank Risk Taking" by *Anil Ari*, University of Cambridge, and "Why Are Banks Not Recapitalized During Crises?" by *Matteo Crosignani*, New York University Stern School of Business. Both papers were selected among numerous excellent submissions and address topical economic policy issues.

Ari's paper looks into the economic mechanisms behind sovereign debt crises and weak bank capitalization. Specifically, the author discusses why (1) undercapitalized banks hold a large amount of domestic government bonds, (2) depositors move their savings abroad and (3) domestic enterprises find themselves short of credit. The simultaneous occurrence of these phenomena in the euro area periphery is explained by strategic interaction between banks and depositors. Banks in the crisis countries could decide to hold a safe portfolio which will ensure their solvency even in the case of a sovereign default. Alternatively, banks could pursue a gambling strategy by investing in a portfolio with a high share of risky government bonds and a low level of domestic lending to enterprises. Which of these strategies turns out to be optimal for banks depends on depositors' beliefs: If depositors are e.g. pessimistic about the future, they hold low amounts of deposits, in which case banks will

have to offer higher interest rates to attract deposits, which in turn implies an incentive for banks to hold a riskier portfolio. This is a self-fulfilling equilibrium situation in which a credit crunch occurs.

Crosigniani's paper analyzes the root causes for the slow banking sector recapitalization in the euro area crisis countries. The explanation he arrives at rests on the interlinkage of public and private sector incentives, which typically occurs in crisis countries. Undercapitalized banks have an incentive to invest in risky domestic government bonds because their downside risk is constricted by limited liability. For the public sector, on the other hand, undercapitalized banks are the ideal buyers of domestic sovereign bonds. Banks' purchases of government bonds, how-

ever, come at the expense of lending to domestic enterprises and reduced tax income. By exploring these incentive mechanisms, Crosigniani explains the simultaneous increase in demand for domestic government bonds and decrease in lending to domestic enterprises as well as the persistent undercapitalization of the banking sector.

Finally, the Dr. Maria Schaumayer Scholarship, which is granted to women in research for their "Habilitation" (i.e., post-doctoral projects in pursuit of full professorship), was awarded to *Karoline Spies* from the Vienna University of Economics and Business. Spies has specialized in the legal issues of taxation, and her habilitation project on "Permanent Establishments and Value Added Tax" also deals with these issues.

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 Q1/14

Austria: Economic Activity Picks Up at the Turn of the Year  
*Christian Ragacs*

Reformed Economic Governance Structure in the European Union  
and the Way Forward  
*Christiane Kment, Isabella Lindner*

### Issue Q2/14

Moderate Upswing amid High Uncertainty. Economic Outlook for Austria from  
2014 to 2016 (June 2014)  
*Christian Ragacs, Klaus Vondra*

Fiscal Projections by the Oesterreichische Nationalbank: Methods and Motives  
*Doris Prammer, Lukas Reiss*

Intergenerational Transmission: How Strong Is the Effect of Parental Home  
Ownership?  
*Karin Wagner*

Toward a European Banking Union: Taking Stock – Summary of the 42<sup>nd</sup> OeNB  
Economics Conference in Vienna on May 12 and 13, 2014  
*Helmut Elsinger, Walter Waschiczek*

### Issue Q3/14

Austrian GDP Growth at 0.8% in 2014  
*Gerhard Fenz*

Labor Productivity Developments in Austria in an International Perspective  
*Martin Schneider*

How Gender-Specific Are Payments? A Study Based on Austrian Survey Data from  
1996 to 2011  
*Klaus Forstner, Karin Wagner*

Austria Holds Intra-EU Export Market Shares almost Constant despite Difficult  
Economic Environment  
*Klaus Vondra*

### **Issue Q4/14**

Growth Remains Weak in 2015 – Economic Outlook for Austria from 2014 to 2016 (December 2014)

*Gerhard Fenz, Martin Schneider*

A Common European Unemployment Insurance – A Much Debated Route toward European Fiscal Union

*Christian Beer, Walpurga Köhler-Töglhofer, Alfred Stiglbauer*

Bitcoin – The Promise and Limits of Private Innovation in Monetary and Payment Systems

*Christian Beer, Beat Weber*

### **Issue Q1/15**

Austria: Economic Growth in 2014 at 0.4%

*Christian Ragacs, Fabio Rumler, Martin Schneider*

Determinants of Inflation Perceptions and Expectations: an Empirical Analysis for Austria

*Friedrich Fritzer, Fabio Rumler*

Impact of Inflation on Fiscal Aggregates

*Doris Prammer, Lukas Reiss*

Housing Markets in Austria, Germany and Switzerland

*Martin Schneider, Karin Wagner*

### **Issue Q2/15**

Four-year economic downturn to end in 2016 – Economic outlook for Austria from 2015 to 2017 (June 2015)

*Christian Ragacs, Klaus Vondra*

Financial literacy gaps of the Austrian population

*Maria Silgoner, Bettina Greimel-Fuhrmann, Rosa Weber*

Implications of ultra-low interest rates for financial institutions' asset liability management – a policy-oriented overview

*Christian Beer, Ernest Gnan*

Long-Term Perspectives for Economic Growth – summary of the OeNB's 43<sup>rd</sup> Economics Conference

*Doris Prammer, Helmut Stix*

# 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.

<http://www.oenb.at/en/Publications/Oesterreichische-Nationalbank/Annual-Report.html>

## **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.

<http://www.oenb.at/Publikationen/Volkswirtschaft/Konjunktur-aktuell.html>

## **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.

<http://www.oenb.at/en/Publications/Economics/Monetary-Policy-and-the-Economy.html>

## **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.

<http://www.oenb.at/en/Publications/Financial-Market/Facts-on-Austria-and-Its-Banks.html>

## **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.

<http://www.oenb.at/en/Publications/Financial-Market/Financial-Stability-Report.html>

## **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.

<http://www.oenb.at/en/Publications/Economics/Focus-on-European-Economic-Integration.html>

## **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.

<http://www.oenb.at/Publikationen/Statistik/Statistiken---Daten-und-Analysen.html>



## Statistiken – Daten & Analysen: Sonderhefte Statistiken – Daten & Analysen: Special Issues

German | irregularly  
English | irregularly

In addition to the regular issues of the quarterly statistical series “Statistiken – Daten & Analysen,” the OeNB publishes a number of special issues on selected statistics topics (e.g. sector accounts, foreign direct investment and trade in services).

<http://www.oenb.at/en/Publications/Statistics/Special-Issues.html>

## Research Update

English | quarterly

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

<http://www.oenb.at/en/Publications/Economics/research-update.html>

## 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:

<http://www.oenb.at/en/Publications/Economics/CESEE-Research-Update.html>

## OeNB Workshops 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.

<http://www.oenb.at/en/Publications/Economics/Proceedings-of-OeNB-Workshops.html>

## 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.

<http://www.oenb.at/en/Publications/Economics/Working-Papers.html>

## 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.

<http://www.oenb.at/en/Publications/Economics/Economics-Conference.html>

## Proceedings of the Conference on European Economic Integration

English | annually

The OeNB’s annual Conference on European Economic Integration (CEEI) 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. For an overview see:

<http://www.oenb.at/en/Publications/Economics/Conference-on-European-Economic-Integration-CEEI.html>

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

[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.

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

<http://www.oenb.at/en/Publications/Financial-Market/Publications-of-Banking-Supervision.html>

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